Pariksha Saathi — Reasoning Notes

19 topics • 55 lessons • updated 28 October 2026

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The Reasoning topics in the syllabus of: SSC CGL, IBPS PO, SSC MTS, SSC CHSL, SBI PO, SBI Clerk, IBPS Clerk, RRB NTPC, RRB Group D, RRB ALP, SSC GD Constable, Agniveer (Army GD), UP Police Constable, MP Police Constable, Rajasthan Police Constable, UPPSC Prelims, MPPSC Prelims, UPSSSC PET, BSSC Inter Level, Rajasthan Patwari, Haryana CET (Group C), DSSSB TGT. Each topic ends with a link to its free practice questions; full mock tests are free in the Pariksha Saathi app and on the website.

Contents

Analogy
Blood Relations
Classification
Coding-Decoding
Direction Sense
Series Completion
Syllogism
Venn Diagram
Calendar
Clock
Cubes and Dice
Data Sufficiency
Inequality
Input-Output
Mathematical Operations
Puzzles (Floor, Scheduling, Matrix)
Ranking and Order
Seating Arrangement
Statement-Based Reasoning
Revision sheet

Analogy

Analogies: Meaning, Letters, Numbers and Figures

An analogy A:B::C:D requires the directed relationship from A to B to be preserved from C to D, rather than merely finding a word or object associated with C. For word analogies, use the supplied meanings or relationships to distinguish synonyms, opposites, component-to-whole, instrument-to-function, producer-to-product and stated levels of intensity. For letters, apply the specified alphabet positions, shifts, wraparound, reversal or position-dependent operations without adding a different rule. For numbers, carry out the stated transformation in its stated order and confirm it on both the sample and target, using a reverse calculation or an equivalent formula when possible. For figures, track shape, count, position, orientation and fill separately, changing only the attributes named in the rule. Test every option against the same complete relationship and reject any option that reverses its direction, omits a step or changes an attribute that should remain fixed.

Examples

- Here quiet and silent both mean "making no noise"; rapid and swift both mean "fast". slow means "not fast"; rough means "uneven"; late means "after the expected time". Complete the same-meaning analogy: quiet : silent :: rapid : ? Worked solution: The first pair shares the stated meaning "making no noise". Preserve that relationship for rapid: the supplied definition gives swift the same meaning, "fast". The other choices have separately stated meanings and do not match this meaning.
- Rule: square the input number, then add 1. 4 : 17 :: 7 : ? Worked solution: The sample follows $4^2 + 1 = 17$. For 7, square first: $7^2 = 49$, then add 1 to obtain 50. Check by removing 1: $50 - 1 = 49$, exactly the input square.
- Rule: reflect a 2 × 2 figure across its vertical centre line, swapping left and right within each row while retaining row order. Thus [A B; C D] becomes [B A; D C], where the semicolon separates rows. Apply the rule to this figure; spaces separate cells and the line break separates rows: ▲ ● ■ ☆ Worked solution: The top row ▲ ● becomes ● ▲; the

bottom row ■ ☆ becomes ☆ ■. This gives: ● ▲ ☆ ■ Only horizontal positions are exchanged; neither the two rows nor the individual symbol identities are exchanged.

> **Quick revision:** Preserve A→B as C→D; use stated word meanings and explicit letter/number rules; for figures track shape, count, position, orientation and fill.

Analogy Solved Questions

Analogy questions ask you to complete a pair using the same relationship as a given pair — the whole skill is naming that relationship precisely before looking at the options. This page covers that approach, letter/alphabet analogies, collective-noun analogies, and the trap of two relationships that look similar but aren't, with several fully worked examples covering the patterns that come up most. Name the relationship between the first pair in words before looking at the options — "tool used by," "type of," "opposite of," "part of" — a vague sense of "these are related somehow" leads to the wrong option. Apply that exact same relationship, in the exact same direction (first word → second word), to the third word. Reversing the direction partway through is a common mistake. For number analogies, check standard operations in order: a fixed addition/subtraction, a fixed multiplication/division, then squares or cubes. If more than one option seems plausible, go back and restate the relationship more precisely — a precise relationship usually rules out all but one option. Letter analogies apply the same alphabet-position shift or pattern to each letter of a word, exactly like Coding-Decoding — e.g. if the first pair shows every letter moved forward by a fixed number of places, apply that same shift letter-by-letter to the new word. Collective-noun analogies pair a specific group-name with what it's a group OF (a "Bouquet" is a group of "Flowers") — name the group-type relationship explicitly rather than just sensing the words are connected. Watch for two relationships that look similar on the surface but aren't logically the same type — "Author is to Book" (a creator and their creation) is a different kind of relationship from "Teacher is to Student" (a role and the person it acts upon), even though both pairs describe two things professionally linked to each other.

Examples

- Pen is to Writer as Brush is to ? Solution: A Pen is the tool a Writer uses to do their work. Applying the same "tool used by" relationship: a Brush is the tool a Painter uses. Answer: Painter
- Mango is to Fruit as Carrot is to ? Solution: The relationship is "type of" — Mango is a type of Fruit. Applying the same relationship: Carrot is a type of Vegetable. Answer: Vegetable
- 4 : 16 :: 6 : ? Solution: Check the relationship between 4 and 16: $4^2 = 16$, so the operation is "squared". Apply the same operation to 6: $6^2 = 36$. Answer: 36
- Big is to Small as Fast is to ? Solution: The relationship is "opposite of" — Small is the opposite of Big. Applying the same relationship: the opposite of Fast is Slow. Answer: Slow
- ACE is to BDF as GHI is to ? Solution: Compare each letter: A→B, C→D, E→F — every letter has shifted forward by exactly 1 place. Apply the same +1 shift to G, H, I: G→H, H→I, I→J. Answer: HIJ
- Bouquet is to Flowers as Flock is to ? Solution: The relationship is "a named group of" — a Bouquet is a group of Flowers. A "Flock" is the standard collective noun for a group of Birds (it's also used for sheep and goats, but birds is the most common pairing). Answer: Birds
- Author is to Novel as Sculptor is to ? Solution: The relationship is "creator of" — an Author creates a Novel. Applying the same relationship: a Sculptor creates a Sculpture. Answer: Sculpture
- Practice: Needle is to Tailor as Scalpel is to ? (Answer: Surgeon (tool used by))
- Practice: Rose is to Flower as Lion is to ? (Answer: Animal (type of))
- Practice: 2 : 8 :: 3 : ? (Answer: 27 (cubed: $2^3 = 8$, so $3^3 = 27$))
- Practice: BDF is to CEG as HJL is to ? (Answer: IKM (every letter shifts forward by 1))
- Practice: Pride is to Lions as Herd is to ? (Answer: Cattle (a standard collective noun; also used for elephants or deer))
- Practice: Composer is to Symphony as Architect is to ? (Answer: Building (creator of))
- Practice: 5 : 30 :: 7 : ? (Answer: 56 (the operation is n × (n+1): 5×6=30, so 7×8=56))

Quick revision: Name the relationship between the first pair in words before looking at the options — "tool used by," "type of," "opposite of," "part of" — a vague sense of "these are related somehow" leads to the wrong option; Apply that exact same relationship, in the exact same direction (first word → second word), to the third word. Reversing the direction partway through is a common mistake; For number analogies, check standard operations in order: a fixed addition/subtraction, a fixed multiplication/division, then squares or cubes; If more than one option seems plausible, go back and restate the relationship more precisely — a precise relationship usually rules out all but one option; Letter analogies apply the same alphabet-position shift or pattern to each letter of a word, exactly like Coding-Decoding — e.g. if the first pair shows every letter moved forward by a fixed number of places, apply that same shift letter-by-letter to the new word; Collective-noun analogies pair a specific group-name with what it's a group OF (a "Bouquet" is a group of "Flowers") — name the group-type relationship explicitly rather than just sensing the words are connected; Watch for two relationships that look similar on the surface but aren't logically the same type — "Author is to Book" (a creator and their creation) is a different kind of relationship from "Teacher is to Student" (a role and the person it acts upon), even though both pairs describe two things professionally linked to each other

Free practice questions: parikshasaathi.com/q/analogy/

Blood Relations

Blood relations: reading a family statement

Blood Relations questions trace a chain of family connections ("A is B's father", "B is C's sister") and ask how two specific people are related. The only reliable method is to build the family tree explicitly, one relationship at a time, rather than trying to hold the whole chain in your head.

Track two things for every person mentioned: their GENERATION relative to the others (same level, one up, one down) and their GENDER, since almost every relationship term in English is gender-specific (brother/sister, uncle/aunt, nephew/niece, grandson/granddaughter). A relationship word itself often reveals gender: "X is Y's son" tells you X is male without being told separately.

Classic phrasings have standard decodings worth memorizing: "my father's only son" (said by someone with no brothers) refers to the speaker THEMSELVES, since they're their father's only son. "My mother's only daughter" (said by a male speaker) refers to the speaker's SISTER, since the speaker himself can't be "a daughter." Watch generation carefully: a person can never be their OWN grandfather's son (that's a generation too close) — "my grandfather's only son" necessarily refers to the generation between the speaker and the grandfather, i.e. the speaker's father or uncle.

In-law relationships appear once marriage enters the chain: a spouse's sibling is a brother/sister-in-law; a spouse's parent is a father/mother-in-law; one's child's spouse is a son/daughter-in-law. A person connected only through someone else's marriage (like a spouse's sibling's spouse) has no direct BLOOD relationship at all — it's fine for a question to expect "no direct relation" as the answer.

Examples

- A is B's father. C is A's mother. C is the mother of B's father — so C is B's (paternal) grandmother.
- P is Q's son. R is P's sister. P and R share the same parent, Q; since R is female, R is Q's daughter.
- Pointing to a boy, a man says, "He is the son of my father's only son." If the man has no brothers, "my father's only son" is the man himself, so the boy is the man's own son.
- A boy says, "Her mother is my mother's only daughter." Since the boy is male, "my mother's only daughter" must be his sister — so the girl's mother is his sister, making the girl his niece.
- Rohan says, "This girl is the wife of the only son of my grandfather." Rohan is his grandfather's GRANDSON, not his son, so "my grandfather's only son" must be the generation between them — Rohan's father. The girl, that son's wife, is Rohan's mother.
- A is B's husband. C is B's brother. C is the brother of A's wife — a wife's brother is one's brother-in-law.
- A's son is B. B is married to C. C's mother is D. D is the mother of A's son's wife — D is A's son's mother-in-law, with no direct blood relation to A at all.

- A tells B, "Your mother's husband's sister is my mother." "Your mother's husband" is B's father; his sister is B's paternal aunt; since that aunt is A's mother, A and B are cousins.

> **Quick revision:** Build the family tree step by step, tracking generation and gender for every person. "My father's only son" (no brothers) = the speaker. A person can't be their own grandfather's son — that phrase always points to the generation between them. In-law relations arise only through marriage, not blood.

Blood Relation Solved Questions

Blood relation puzzles are really just careful reading — the logic is simple once you trace each relationship one step at a time instead of trying to hold the whole family tree in your head. This page covers that approach, standard relation vocabulary, generation-counting, and the classic "generation-skip" trick, with several fully worked examples. Trace one relationship at a time. Convert each clue into a small family-tree sketch (even mentally) before jumping to the answer. "Only son" / "only daughter" is a strong clue — it tells you there's exactly one person matching that description, which usually lets you identify a specific person rather than a category. Watch whose perspective the sentence is told from — "my mother's mother" is the speaker's grandmother, not the listener's. Memorize the common compound chains instead of re-deriving them every time: father's/mother's son = brother; father's/mother's daughter = sister; mother's brother = maternal uncle; father's brother = paternal uncle; a spouse's sibling = brother-in-law/sister-in-law. Unless a question specifically says "step," "half" or "adopted," assume every sibling relation is a full (same-parents) relation — this is what makes statements like "A and B are sisters, so they share the same brothers" valid. For "how many members in this family" questions, list every person named along with their known relation to one fixed reference person, then count the list — don't try to track the count in your head while reading. Watch for the "generation-skip" trick: a clue like "A's father is B's son" doesn't make B a sibling of A's father — it makes B A's grandparent, since B is the PARENT of A's father. After finding the final relationship, re-check it against both people's genders and generations implied by the question — a "daughter" answer requires a female, and a "grandfather" answer requires someone one generation above a parent.

Examples

- A is the brother of B. C is the sister of A. How is C related to B? Solution: A and B are siblings (A is B's brother). C is A's sister, so C is also a sibling of A — and therefore of B. Since C is specified as female, C is B's sister. Answer: C is the sister of B
- Pointing to a man, a woman says, 'His mother is the only daughter of my mother.' How is the woman related to the man? Solution: "The only daughter of my mother" — the woman herself is a daughter of her mother, and since there's only one, that daughter must be the woman herself. So "his mother" = the woman herself. Answer: The woman is the man's mother
- Introducing a man, a woman says, 'He is the only son of my mother's mother.' How is the man related to the woman? Solution: "My mother's mother" is the woman's (maternal) grandmother. The grandmother's only son is the brother of the woman's mother — i.e., the woman's maternal uncle. Answer: The man is the woman's (maternal) uncle
- A and B are sisters. C is A's son. D is B's brother. How is D related to C? Solution: A and B are sisters, so they share the same siblings. D is B's brother, so D is also A's brother. C is A's son, and D is A's brother — so D is C's maternal uncle. Answer: D is C's (maternal) uncle
- In a family, P and Q are married. They have a daughter, R, who is married to S. R and S have two children, T and U. How many members are there in this family? Solution: List everyone named: P, Q (the original couple), R (their daughter), S (R's husband, who joins the family by marriage), T and U (R and S's children). Count the list: P, Q, R, S, T, U = 6 members. Answer: 6 members
- X is Y's wife. Z is Y's brother. How is Z related to X? Solution: Y is X's husband. Z is Y's brother, which makes Z the brother of X's husband. The brother of one's husband is one's brother-in-law. Answer: Z is X's brother-in-law
- Pointing to a girl, a man says, 'She is the daughter of my sister.' If the man has only one sister, how is the girl related to the man? Solution: The girl's mother is the man's sister, so the girl is the man's sister's daughter. A sister's daughter is one's niece. Answer: The girl is the man's niece
- A's mother is B's daughter. If B is male, how is B related to A? Solution: B's daughter = A's mother, so B is the PARENT of A's mother — not a sibling of A's mother. Since B is male and is the father of A's mother, B is A's maternal

grandfather. Answer: B is A's maternal grandfather

- Practice: Pointing to a photograph, a man says, ‘She is the daughter of my father’s only son.’ If the man has no brothers, how is the woman in the photograph related to him? (Answer: Daughter (the man himself is his father’s only son))
- Practice: P is the father of Q. Q is the sister of R. How is R related to P? (Answer: Son or daughter (child) — R’s gender isn’t given)
- Practice: Introducing a man, a woman said, ‘His wife is the only daughter of my father.’ How is the man related to the woman? (Answer: Husband (the only daughter of the woman’s father must be the woman herself))
- Practice: In a family, M and N are married. They have one son, O, who is married to P. O and P have two children, Q and R. How many members are in this family? (Answer: 6 members: M, N, O, P, Q, R.)
- Practice: X is Y's wife. Z is Y's brother. How is Z related to X? (Answer: Brother-in-law.)
- Practice: Pointing to a girl, a man says, ‘She is the daughter of my sister.’ If the man has only one sister, how is the girl related to the man? (Answer: Niece.)
- Practice: A's father is B's son. If B is female, how is B related to A? (Answer: Paternal grandmother — B's son is A's father, so B is one generation above him, and since B is female, she is his mother, making her A's grandmother on the father's side.)

> **Quick revision:** Trace one relationship at a time. Convert each clue into a small family-tree sketch (even mentally) before jumping to the answer; "Only son" / "only daughter" is a strong clue — it tells you there’s exactly one person matching that description, which usually lets you identify a specific person rather than a category; Watch whose perspective the sentence is told from — "my mother’s mother" is the speaker’s grandmother, not the listener’s; Memorize the common compound chains instead of re-deriving them every time: father's/mother's son = brother; father's/mother's daughter = sister; mother's brother = maternal uncle; father's brother = paternal uncle; a spouse's sibling = brother-in-law/sister-in-law; Unless a question specifically says "step," "half" or "adopted," assume every sibling relation is a full (same-parents) relation — this is what makes statements like "A and B are sisters, so they share the same brothers" valid; For "how many members in this family" questions, list every person named along with their known relation to one fixed reference person, then count the list — don't try to track the count in your head while reading; Watch for the "generation-skip" trick: a clue like "A's father is B's son" doesn't make B a sibling of A's father — it makes B A's grandparent, since B is the PARENT of A's father; After finding the final relationship, re-check it against both people's genders and generations implied by the question — a "daughter" answer requires a female, and a "grandfather" answer requires someone one generation above a parent

Family Tree (Blood Relations)

This is Blood Relations at a larger scale — instead of tracing one relationship, you build a small family tree across generations and read multiple relationships off it. Here’s the approach, one shared family tree with six fully worked questions, and a few more to try yourself. Build the tree top to bottom as you read each clue — the oldest generation at the top, their children below, their children’s children below that. Mark every person’s gender the moment it’s given (directly, or implied by a word like "husband," "sister," or "son") — the final relationship name (uncle vs aunt, grandson vs granddaughter) always depends on it. A married-in person (a husband or wife who isn’t a blood descendant) still belongs on the tree at their spouse’s generation level, connected sideways rather than by a line of descent. Once the tree is drawn, read relationships directly off it by counting generations and tracing the connecting line — this is far more reliable than trying to reason through a long relationship chain in your head. A "how many X are mentioned" question only counts people the clues actually name or clearly establish — don’t assume additional unmentioned siblings, spouses or children exist just because a real family might plausibly have them.

Examples

- P is the father of Q. Q is the mother of R, a boy. S is the husband of Q. T is the sister of R. How is P related to R? Solution: Tree: P (generation 1) is Q’s father. Q (generation 2) is R and T’s mother; S (generation 2) is Q’s husband, so S is R and T’s father too. R and T (generation 3) are siblings. P is Q’s father, and Q is R’s mother — so P is R’s grandfather, specifically on R’s mother’s side. Answer: P is the maternal grandfather of R

- Using the same family and clues, how is S related to P? Solution: S is Q's husband, and P is Q's father — the husband of one's daughter is one's son-in-law. Answer: S is the son-in-law of P
- Using the same family and clues, how is T related to S? Solution: T is R's sister, and S is R's father (as Q's husband) — so T is also S's daughter. Answer: T is the daughter of S
- Using the same family and clues, how many of P's grandchildren are mentioned in the information? Solution: P's only child mentioned is Q, and Q's children are R and T — that's 2 of P's grandchildren mentioned. Answer: 2
- Using the same family and clues, how is R related to T? Solution: R is a boy, and T is stated to be R's sister — so from R's side, T is his sister, meaning R is her brother. Answer: R is the brother of T
- Using the same family and clues, how is P related to S? Solution: S is the son-in-law of P (established earlier) — the reverse relationship, from P's side, makes P the father-in-law of S. Answer: P is the father-in-law of S
- Practice: Using the same family and clues, how is Q related to T? (Answer: Q is the mother of T)
- Practice: Using the same family and clues, how is R related to S? (Answer: R is the son of S)
- Practice: Using the same family and clues, how is T related to P? (Answer: T is the granddaughter of P)
- Practice: Using the same family and clues, how is S related to T? (Answer: S is the father of T)
- Practice: Using the same family and clues, how is Q related to P (including gender)? (Answer: Q is the daughter of P (Q is female, since Q is R and T's mother))

> **Quick revision:** Build the tree top to bottom as you read each clue — the oldest generation at the top, their children below, their children's children below that; Mark every person's gender the moment it's given (directly, or implied by a word like "husband," "sister," or "son") — the final relationship name (uncle vs aunt, grandson vs granddaughter) always depends on it; A married-in person (a husband or wife who isn't a blood descendant) still belongs on the tree at their spouse's generation level, connected sideways rather than by a line of descent; Once the tree is drawn, read relationships directly off it by counting generations and tracing the connecting line — this is far more reliable than trying to reason through a long relationship chain in your head; A "how many X are mentioned" question only counts people the clues actually name or clearly establish — don't assume additional unmentioned siblings, spouses or children exist just because a real family might plausibly have them

Free practice questions: parikshasaathi.com/q/blood-relations/

Classification

Classification: finding the odd one out

Classification ("odd one out") questions give you four or five items and ask which one breaks the pattern the others share. The entire skill is finding the EXACT rule the majority follow — not just a vague impression that something "feels" different.

Work through a checklist of common rule types rather than guessing: (1) Category membership — are three items fruits and one a vegetable, three birds and one a reptile? (2) Mathematical property — are three numbers prime and one composite, three perfect squares and one not? (3) A hidden arithmetic relationship within each item — in pairs like "6-36, 7-49, 8-64, 5-30", check if the second number is always the square of the first; the one that breaks the pattern (5-30, since $5^2=25\neq30$) is the odd one out, not necessarily the one that "looks" different. (4) Structural property — shapes with versus without curves, words with an even versus odd letter count, numbers divisible by a specific value.

The most common mistake is anchoring on the first plausible-looking rule and stopping there. Always verify the rule against ALL the remaining items, not just the first two — a pattern that fits three items but quietly fails a fourth isn't the real rule. If your first guess leaves two items looking equally "odd," the rule is wrong; a well-formed question always has exactly one item that uniquely breaks a rule the other three (or four) genuinely share.

Examples

- Mango, Banana, Carrot, Apple: Mango, Banana and Apple are fruits; Carrot is a vegetable. Odd one out: Carrot.
- 7, 11, 15, 13: 7, 11 and 13 are prime numbers; 15 (=3×5) is composite. Odd one out: 15.

- 8-64, 5-25, 9-81, 6-42: in 8-64, 5-25 and 9-81 the second number is the square of the first ($8^2=64$, $5^2=25$, $9^2=81$); but $6^2=36\neq42$. Odd one out: 6-42.
- Delhi, Mumbai, Chennai, Sydney: the first three are cities in India; Sydney is in Australia. Odd one out: Sydney.
- 9, 16, 25, 30: 9 (3^2), 16 (4^2) and 25 (5^2) are perfect squares; 30 is not. Odd one out: 30.
- Triangle, Square, Rectangle, Circle: Triangle, Square and Rectangle have straight edges and corners; a Circle has neither. Odd one out: Circle.
- Cricket, Football, Hockey, Swimming: the first three are team sports played between two opposing sides; Swimming is primarily an individual sport. Odd one out: Swimming.
- Gold, Silver, Copper, Diamond: Gold, Silver and Copper are metals; Diamond is a mineral form of carbon, not a metal. Odd one out: Diamond.

> **Quick revision:** Test a candidate rule against EVERY item, not just two. Common rule families: category membership, prime/composite/square, a hidden arithmetic link within each item, and structural properties (curved vs straight edges, etc.).

Classification (Odd One Out)

Classification questions give you a handful of items and ask which one doesn't belong — the trick is finding the exact rule the majority share, not just going by a hunch. Here's the approach, six fully worked examples covering the patterns that come up most, and a few to try yourself. Look for the rule that groups most of the items: a shared category, a shared mathematical property (prime, perfect square, even), a shared word-pattern, or a shared relationship between parts of each item. Check EVERY item against your hypothesized rule before answering — if your rule only explains 3 of 4 items and leaves a different one out than you expected, the rule itself is wrong, not just your answer. When items could be grouped more than one way, the correct rule is the one that cleanly separates exactly ONE item from the rest — if a rule leaves two items looking "odd", that's not the intended rule. For pairs or sets of numbers, check the relationship within each pair first (ratio, difference, square, sum) before comparing across pairs — the odd one out usually breaks that specific internal relationship. If every item seems to belong to the same obvious category (all animals, all shapes) and no meaning-based rule separates one of them, look for a hidden structural rule instead — letter count, number of sides, or a shared sub-property within that category.

Examples

- Find the odd one out: Mango, Banana, Carrot, Apple Solution: Mango, Banana and Apple are all fruits. Carrot is a vegetable, not a fruit — it doesn't share the rule the other three follow. Answer: Carrot
- Find the odd one out: 7, 11, 15, 13 Solution: 7, 11 and 13 are all prime numbers (divisible only by 1 and themselves). $15 = 3 \times 5$ is not prime — it's composite, breaking the pattern. Answer: 15
- Find the odd one out: 24-6, 36-9, 45-9, 16-4 Solution: Check the relationship within each pair: $24 \div 6 = 4$, $36 \div 9 = 4$, $45 \div 9 = 5$, $16 \div 4 = 4$. Three of the four pairs have a 4 : 1 ratio. 45-9 has a 5 : 1 ratio instead, breaking the shared pattern. Answer: 45-9
- Find the odd one out: Eagle, Sparrow, Parrot, Snake Solution: Eagle, Sparrow and Parrot are all birds. Snake is a reptile, not a bird — it doesn't share the rule the other three follow. Answer: Snake
- Find the odd one out: CAT, DOG, LION, COW Solution: All four are animals, so the category rule doesn't separate any of them — look for a structural rule instead. Letter count: CAT, DOG and COW each have 3 letters. LION has 4 letters, breaking that pattern. Answer: LION
- Find the odd one out: Square, Rectangle, Rhombus, Trapezium Solution: A Square, Rectangle and Rhombus are all parallelograms — both pairs of opposite sides are parallel in each. A Trapezium has only ONE pair of parallel sides, breaking the shared "parallelogram" rule. Answer: Trapezium
- Practice: Find the odd one out: Triangle, Square, Rectangle, Circle (Answer: Circle (the others are all polygons with straight sides; a circle has none))
- Practice: Find the odd one out: 16, 25, 36, 48 (Answer: 48 (the others are perfect squares — 4^2, 5^2, 6^2 — 48 is not))
- Practice: Find the odd one out: 8-64, 5-25, 9-81, 6-42 (Answer: 6-42 (the others pair a number with its square; $6^2 = 36$, not 42))

- Practice: Find the odd one out: 12-144, 9-81, 7-49, 8-72 (Answer: 8-72 (the others pair a number with its square — 8^2 = 64, not 72))
- Practice: Find the odd one out: DELHI, PARIS, TOKYO, INDIA (Answer: INDIA (the others are city names; India is a country))

> **Quick revision:** Look for the rule that groups most of the items: a shared category, a shared mathematical property (prime, perfect square, even), a shared word-pattern, or a shared relationship between parts of each item; Check EVERY item against your hypothesized rule before answering — if your rule only explains 3 of 4 items and leaves a different one out than you expected, the rule itself is wrong, not just your answer; When items could be grouped more than one way, the correct rule is the one that cleanly separates exactly ONE item from the rest — if a rule leaves two items looking "odd", that's not the intended rule; For pairs or sets of numbers, check the relationship within each pair first (ratio, difference, square, sum) before comparing across pairs — the odd one out usually breaks that specific internal relationship; If every item seems to belong to the same obvious category (all animals, all shapes) and no meaning-based rule separates one of them, look for a hidden structural rule instead — letter count, number of sides, or a shared sub-property within that category

Odd Pair Out Solved Questions

This is Classification applied to pairs instead of single items — three pairs share a hidden numeric relationship, and one pair breaks it. Here's the approach, six fully worked examples, and a few to try yourself. Check the relationship within each pair individually first (does the second number look like a square, cube, a simple multiple, or a product of the first number with something?) before comparing across pairs. Test your hypothesized relationship against every pair, not just the first two — a rule that fits three out of four pairs (and breaks only on the fourth) is the intended rule. Common relationships to try, in order: second = first^2, second = first^3, second = first × a fixed number, second = first × (first + a fixed number). Once you've confirmed a relationship holds for three pairs, calculate what the fourth pair's second number SHOULD be under that same relationship — this confirms the odd pair with certainty, rather than just a hunch. Not every pair relationship is multiplicative — if squares, cubes and multiples all fail, check a simple additive one instead: second = first + a fixed number, or first + second = a fixed total.

Examples

- Find the pair that does not belong with the others: (3,9), (4,16), (5,20), (6,36) Solution: Most pairs follow "second = first^2": 3^2=9, 4^2=16, 6^2=36 — all match. For (5,20): 5^2 = 25, not 20 — this pair breaks the pattern. Answer: (5,20)
- Find the pair that does not belong with the others: (8,4), (12,6), (20,10), (15,6) Solution: Most pairs follow "second = first ÷ 2": 8÷2=4, 12÷2=6, 20÷2=10 — all match. For (15,6): 15÷2=7.5, not 6 — this pair breaks the pattern. Answer: (15,6)
- Find the pair that does not belong with the others: (2,8), (3,27), (4,64), (5,100) Solution: Most pairs follow "second = first^3": 2^3=8, 3^3=27, 4^3=64 — all match. For (5,100): 5^3=125, not 100 — this pair breaks the pattern. Answer: (5,100)
- Find the pair that does not belong with the others: (5,30), (6,42), (7,56), (8,56) Solution: Most pairs follow "second = first × (first+1)": 5×6=30, 6×7=42, 7×8=56 — all match. For (8,56): 8×9=72, not 56 — this pair breaks the pattern. Answer: (8,56)
- Find the pair that does not belong with the others: (12,7), (15,10), (20,15), (18,11) Solution: Most pairs follow "first – second = 5": 12–7=5, 15–10=5, 20–15=5 — all match. For (18,11): 18–11=7, not 5 — this pair breaks the pattern. Answer: (18,11)
- Find the pair that does not belong with the others: (4,13), (6,15), (8,17), (10,18) Solution: Most pairs follow "second – first = 9": 13–4=9, 15–6=9, 17–8=9 — all match. For (10,18): 18–10=8, not 9 — this pair breaks the pattern. Answer: (10,18)
- Practice: Find the pair that does not belong with the others: (7,49), (8,64), (9,72), (10,100) (Answer: (9,72))
- Practice: Find the pair that does not belong with the others: (10,5), (16,8), (24,11), (20,10) (Answer: (24,11))
- Practice: Find the pair that does not belong with the others: (2,8), (3,27), (4,64), (5,126) (Answer: (5,126))
- Practice: Find the pair that does not belong with the others: (9,3), (16,4), (25,5), (28,7) (Answer: (28,7) — the others pair a perfect square with its square root; 7^2 = 49, not 28)
- Practice: Find the pair that does not belong with the others: (11,22), (14,28), (17,35), (20,40) (Answer: (17,35) — the others double the first number; 17 × 2 = 34, not 35)

Quick revision: Check the relationship within each pair individually first (does the second number look like a square, cube, a simple multiple, or a product of the first number with something?) before comparing across pairs; Test your hypothesized relationship against every pair, not just the first two — a rule that fits three out of four pairs (and breaks only on the fourth) is the intended rule; Common relationships to try, in order: second = first², second = first³, second = first × a fixed number, second = first × (first + a fixed number); Once you've confirmed a relationship holds for three pairs, calculate what the fourth pair's second number SHOULD be under that same relationship — this confirms the odd pair with certainty, rather than just a hunch; Not every pair relationship is multiplicative — if squares, cubes and multiples all fail, check a simple additive one instead: second = first + a fixed number, or first + second = a fixed total

Logical Sequence of Words Solved Questions

These questions ask you to order a set of words by some external logic — a hierarchy, a real-world process, or plain dictionary order — not by any pattern within the words themselves. Here's the approach, six fully worked examples covering each pattern, and a few to try yourself. First identify what kind of order is being asked for — size/hierarchy (smallest to largest), a real-world process (what logically happens first), or dictionary (alphabetical) order. For hierarchy questions, think of the real-world containment: a smaller unit sits inside a larger one (a village is inside a block, a block inside a district), and that containment gives the order directly. For process questions, think through the real sequence of events as they'd actually happen, step by step, rather than guessing from how important or familiar each word sounds. For dictionary order, compare words letter by letter at the first point they differ — and when one word is an exact prefix of another (like "Broth" and "Brother"), the shorter word always comes first. Decide the category from the actual words given, not from how the question is phrased — a set of words can look like it needs a process order but actually only has a clean hierarchy (or vice versa), so check what the words themselves describe before committing.

Examples

- Arrange in a logical order, from smallest administrative unit to largest: 1. District 2. Village 3. State 4. Country 5. Block Solution: A village sits inside a block, a block inside a district, a district inside a state, and a state inside a country. Answer: 2, 5, 1, 3, 4 (Village, Block, District, State, Country)
- Arrange in the order they occur in a process: 1. Seed 2. Fruit 3. Plant 4. Flower 5. Germination Solution: A seed germinates, grows into a plant, the plant produces a flower, and the flower develops into a fruit. Answer: 1, 5, 3, 4, 2 (Seed, Germination, Plant, Flower, Fruit)
- Arrange as they would appear in a dictionary: 1. Patience 2. Patient 3. Pattern 4. Path 5. Patch Solution: The first three letters ("Pat") are shared by all five, so compare from the 4th letter: Patch (c), Path (h), Patience/Patient (i), Pattern (t). Patience and Patient share "Pati," so compare further in: Patience has "...tience," Patient has "...tient" — "c" comes before "t", so Patience comes first. Answer: 5, 4, 1, 2, 3 (Patch, Path, Patience, Patient, Pattern)
- Arrange in the order they occur in a process: 1. Graduation 2. Admission 3. Examination 4. Classes Solution: A student is admitted, then attends classes, then takes examinations, then graduates. Answer: 2, 4, 3, 1 (Admission, Classes, Examination, Graduation)
- Arrange in the order they occur in a process: 1. Interview 2. Shortlisting 3. Application 4. Job Offer Solution: A candidate first submits an application, is then shortlisted, attends an interview, and if successful receives a job offer. Answer: 3, 2, 1, 4 (Application, Shortlisting, Interview, Job Offer)
- Arrange as they would appear in a dictionary: 1. Garden 2. Garage 3. Gather 4. Gadget Solution: All four share "Ga" — compare the 3rd letter: Gadget (d), Garage/Garden (r), Gather (t). So Gadget comes first, Gather comes last. Garage and Garden share "Gar" — compare the 4th letter: Garage (a), Garden (d). "a" comes before "d", so Garage comes before Garden. Answer: 4, 2, 1, 3 (Gadget, Garage, Garden, Gather)
- Practice: Arrange in a logical order, from smallest to largest: 1. Centimetre 2. Kilometre 3. Metre 4. Millimetre (Answer: 4, 1, 3, 2 (Millimetre, Centimetre, Metre, Kilometre))
- Practice: Arrange as they would appear in a dictionary: 1. Bronze 2. Brown 3. Broth 4. Brother (Answer: 1, 3, 4, 2 (Bronze, Broth, Brother, Brown))
- Practice: Arrange in the order they occur in a process: 1. Harvesting 2. Sowing 3. Ploughing 4. Irrigation (Answer: 3, 2, 4, 1 (Ploughing, Sowing, Irrigation, Harvesting))

- Practice: Arrange in a logical order, from smallest to largest unit of time: 1. Hour 2. Second 3. Day 4. Minute (Answer: 2, 4, 1, 3 (Second, Minute, Hour, Day))
- Practice: Arrange in the order they occur in a process: 1. Verdict 2. Trial 3. Arrest 4. Investigation (Answer: 3, 4, 2, 1 (Arrest, Investigation, Trial, Verdict))

> **Quick revision:** First identify what kind of order is being asked for — size/hierarchy (smallest to largest), a real-world process (what logically happens first), or dictionary (alphabetical) order; For hierarchy questions, think of the real-world containment: a smaller unit sits inside a larger one (a village is inside a block, a block inside a district), and that containment gives the order directly; For process questions, think through the real sequence of events as they'd actually happen, step by step, rather than guessing from how important or familiar each word sounds; For dictionary order, compare words letter by letter at the first point they differ — and when one word is an exact prefix of another (like "Broth" and "Brother"), the shorter word always comes first; Decide the category from the actual words given, not from how the question is phrased — a set of words can look like it needs a process order but actually only has a clean hierarchy (or vice versa), so check what the words themselves describe before committing

Letter Group Classification

Three letter-groups share a hidden gap pattern between their letters, and one group breaks it — this is Classification applied specifically to letter clusters, checked using the same position-number trick as Alphabet Series. Here's the approach, six fully worked examples, and a few to try yourself. Convert every letter to its position number (A=1, B=2, … Z=26) first, exactly as in Alphabet Series — comparing numbers is far less error-prone than counting letters in your head. Find the gap between consecutive letters in each group (second − first, third − second). Three groups sharing the same gap pattern point to the rule; the fourth group deviates from it. Check the FULL gap pattern, not just the first gap — a group can match on the first gap and still be the odd one out if its second gap is different. Once you've found the shared gap pattern from three groups, verify it explains all three completely before concluding the fourth is odd — this avoids locking onto a coincidental partial match. Gaps can run backward too (letters decreasing, like T, R, P with a −2, −2 pattern) — treat a negative gap the same way as a positive one; don't assume every group moves forward through the alphabet.

Examples

- Find the odd one out: BDF, CEG, PRT, MOR Solution: Position numbers and gaps: BDF (2,4,6 → +2,+2), CEG (3,5,7 → +2,+2), PRT (16,18,20 → +2,+2) — all share the pattern +2, +2. MOR (13,15,18 → +2,+3) — the second gap is +3, not +2, breaking the pattern. Answer: MOR
- Find the odd one out: ACE, GIK, MOQ, SVY Solution: Position numbers and gaps: ACE (1,3,5 → +2,+2), GIK (7,9,11 → +2,+2), MOQ (13,15,17 → +2,+2) — all share the pattern +2, +2. SVY (19,22,25 → +3,+3) — both gaps are +3, not +2, breaking the pattern. Answer: SVY
- Find the odd one out: ADG, BEH, CFI, DGK Solution: Position numbers and gaps: ADG (1,4,7 → +3,+3), BEH (2,5,8 → +3,+3), CFI (3,6,9 → +3,+3) — all share the pattern +3, +3. DGK (4,7,11 → +3,+4) — the second gap is +4, not +3, breaking the pattern. Answer: DGK
- Find the odd one out: EHK, FIL, GJM, HKO Solution: Position numbers and gaps: EHK (5,8,11 → +3,+3), FIL (6,9,12 → +3,+3), GJM (7,10,13 → +3,+3) — all share the pattern +3, +3. HKO (8,11,15 → +3,+4) — the second gap is +4, not +3, breaking the pattern. Answer: HKO
- Find the odd one out: CEH, FHK, LNQ, ILO Solution: Position numbers and gaps: CEH (3,5,8 → +2,+3), FHK (6,8,11 → +2,+3), LNQ (12,14,17 → +2,+3) — all share the pattern +2, +3. ILO (9,12,15 → +3,+3) — both gaps are +3, not +2 then +3, breaking the pattern. Answer: ILO
- Find the odd one out: TRP, QOM, NLJ, SQN Solution: Position numbers and gaps (letters decreasing): TRP (20,18,16 → −2,−2), QOM (17,15,13 → −2,−2), NLJ (14,12,10 → −2,−2) — all share the pattern −2, −2. SQN (19,17,14 → −2,−3) — the second gap is −3, not −2, breaking the pattern. Answer: SQN
- Practice: Find the odd one out: PRT, QSU, RTV, TVY (Answer: TVY)
- Practice: Find the odd one out: HKN, ILO, JMP, KNR (Answer: KNR)
- Practice: Find the odd one out: BDF, DFH, FHJ, HJM (Answer: HJM)
- Practice: Find the odd one out: ABD, DEG, GHJ, JLN (Answer: JLN (gaps +2,+2, while the others follow +1,+2))

- Practice: Find the odd one out: TRP, SQO, RPN, QNL (Answer: QNL (gaps −3,−2, while the others follow −2,−2))

> **Quick revision:** Convert every letter to its position number (A=1, B=2, … Z=26) first, exactly as in Alphabet Series — comparing numbers is far less error-prone than counting letters in your head; Find the gap between consecutive letters in each group (second − first, third − second). Three groups sharing the same gap pattern point to the rule; the fourth group deviates from it; Check the FULL gap pattern, not just the first gap — a group can match on the first gap and still be the odd one out if its second gap is different; Once you've found the shared gap pattern from three groups, verify it explains all three completely before concluding the fourth is odd — this avoids locking onto a coincidental partial match; Gaps can run backward too (letters decreasing, like T, R, P with a −2, −2 pattern) — treat a negative gap the same way as a positive one; don't assume every group moves forward through the alphabet

Free practice questions: parikshasaathi.com/q/classification/

Coding-Decoding

Coding-Decoding: letter shifting

Coding-Decoding questions disguise words or sentences using a consistent, learnable rule, and ask you to apply that same rule to a new word. The whole topic is really five or six recurring code TYPES — once you recognize which type a question is using, the rest is mechanical.

Letter-shift codes move every letter forward (or backward) by a fixed number of places in the alphabet (A→B→C…, wrapping from Z back to A). Spot the shift by comparing just the FIRST letter of the example word to its coded version, then apply that same shift to every letter of the target word.

Mirror/reverse-alphabet codes pair each letter with its mirror image from the opposite end of the alphabet (A↔Z, B↔Y, C↔X…) — a letter's position from the start always equals its mirror partner's position from the end. Position-number codes replace each letter with its place in the alphabet (A=1, B=2…Z=26), usually written with hyphens between numbers.

Word-substitution codes assign an arbitrary code-word to each real word, shown across two or three overlapping coded sentences; find the one real word and one code-word that are COMMON to two sentences, and that pairing is your answer — pure elimination, no cipher math involved.

Always re-derive the rule from the given example rather than assuming you recognize the pattern from a similar-looking past question — the same surface format (e.g. "X is coded as Y") can hide a shift of a different size, or a totally different code type, from one question to the next. And always double-check whether the question wants you to ENCODE (word → code) or DECODE (code → word) — the direction reverses which way you apply the rule.

Examples

- If CAT is coded as DBU, compare C→D, A→B, T→U: each letter shifts forward by exactly 1. Applying +1 to DOG gives EPH.
- Using the mirror rule (A↔Z, B↔Y…), FLOWER becomes UOLDVI — each letter is replaced by its mirror partner from the opposite end of the alphabet.
- Using A=1, B=2…Z=26, WATER is coded as 23-1-20-5-18 (W=23, A=1, T=20, E=5, R=18). The same rule codes EARTH as 5-1-18-20-8.
- If "pen is good" is coded as "ab cd ef" and "good is costly" is coded as "ef cd gh": "is" is common to both sentences, and "cd" is the only code-word common to both coded sentences — so "is" = "cd". By the same logic, "good" = "ef" and "costly" = "gh".
- Decoding works in reverse: if every letter is shifted forward by 3 to encode, shift every letter BACKWARD by 3 to decode. If the coded word is KRQOLGDB using a +3 shift, the original is HOLIDAY.
- A common trap: assuming the shift amount from one question carries over to the next. Always re-derive it from the specific example given in THAT question — a +2 shift in one question and a +4 shift in the next can look superficially similar.
- Another common trap: position-number codes sometimes count from 0 instead of 1, or number the alphabet in reverse (Z=1…A=26) — always verify the rule against the given example's FIRST letter before trusting an assumed convention.

Quick revision: Identify the code type from the example first: letter-shift (compare first letters), mirror (A↔Z pairing), position-number (A=1…Z=26), or word-substitution (match the common word to the common code-word across two sentences). Re-derive the exact rule every time, never assume it carries over.

Coding-Decoding Solved Questions

Coding-Decoding questions give you a rule in disguise — one coded example — and ask you to apply the same rule to a new word or sentence. There's no single trick that cracks every question, but a handful of rule-types cover almost everything that's actually asked. This page covers the common types — including position-based variable shifts and reverse-then-shift rules — and the habit of checking a guessed rule against every letter before trusting it, with a fully worked example each. Shift ciphers: every letter moves forward or backward by the same fixed number of places in the alphabet (e.g., CAT → DBU is a +1 shift on every letter). Mirror/reverse-alphabet codes: each letter is replaced by the letter the same distance from the OTHER end of the alphabet (A↔Z, B↔Y, C↔X, and so on). Numeric codes: each letter is replaced by its position number in the alphabet (A=1, B=2, … Z=26), or by some fixed arithmetic on that position. Word-substitution codes: whole words (not letters) are swapped for code-words, usually shown across two coded sentences that share a word — matching the repeated word to the repeated code cracks it. Some codes use a NON-uniform shift that depends on each letter's position in the word (e.g., 1st letter +1, 2nd letter +2, 3rd letter +3) rather than one constant amount — always check your guessed rule against EVERY letter of the given example before applying it, since a shift that looks constant for the first two letters can break on the third. A few questions reverse the order of the word's letters first and then apply a simple shift (the order you do these two steps in doesn't change the final result, since shifting is applied letter-by-letter regardless of position) — if a plain constant shift doesn't fit, check whether reversing the word first reveals one. After decoding, verify your answer by reversing your own rule on it — if that doesn't get you back to the original word or letter from the question, the rule you used was wrong.

Examples

- In a certain code language, CAT is written as DBU. How will DOG be written in that language? Solution: Compare each letter: C→D, A→B, T→U — every letter has shifted forward by exactly 1 place in the alphabet. Apply the same +1 shift to D, O, G: D→E, O→P, G→H. Answer: EPH
- In a certain code language, "pen is good" is written as "ab cd ef", and "good is costly" is written as "ef cd gh". What is the code for "costly" in this language? Solution: "pen", "is", "good" code to "ab", "cd", "ef" (in order) in the first sentence; "good", "is", "costly" code to "ef", "cd", "gh" (in order) in the second. "is" and "good" are the words common to both sentences, and "cd" and "ef" are the codes common to both coded sentences — so together, {is, good} = {cd, ef}. "costly" is the only word in the second sentence that does not appear in the first, so its code must be the only code in the second sentence that does not appear among the first sentence's codes. That code is "gh". Answer: gh
- In a code, each letter of a word is replaced by the letter that is the same distance from the end of the alphabet as the original letter is from the start (A↔Z, B↔Y, C↔X, and so on). How will FLOWER be coded? Solution: Position from the start: F=6, L=12, O=15, W=23, E=5, R=18. Mirror position from the end: position p maps to (27 − p) — so F(6)→21=U, L(12)→15=O, O(15)→12=L, W(23)→4=D, E(5)→22=V, R(18)→9=I. Putting the coded letters together in order: U, O, L, D, V, I. Answer: UOLDVI
- In a code, each letter is replaced by its position number in the English alphabet (A=1, B=2, … Z=26), separated by hyphens. If WATER is coded as 23-1-20-5-18, how will EARTH be coded? Solution: Position numbers: E=5, A=1, R=18, T=20, H=8. Writing these in order, separated by hyphens: 5-1-18-20-8. Answer: 5-1-18-20-8
- In a certain code, ANT is written as BPW. Find the pattern (don't assume a constant shift — check every letter), then code DOG using the same pattern. Solution: A→B is +1. N→P is +2. T→W is +3. The shift is NOT constant — it increases by 1 for each successive letter in the word (1st letter +1, 2nd +2, 3rd +3). Apply the same pattern to DOG: D (1st, +1) = E. O (2nd, +2) = Q. G (3rd, +3) = J. Answer: EQJ
- In a certain code, CAT is written as UBD. Find the rule, then code DOG using the same rule. Solution: A constant shift doesn't fit directly (C→U, A→B, T→D don't share one amount). Try reversing the letters first: CAT reversed is TAC. Now shift each letter of TAC by +1: T→U, A→B, C→D, giving UBD — this matches. Apply the same rule to DOG: reversed is GOD. Shift each by +1: G→H, O→P, D→E. Answer: HPE

- Using the rule from the first worked example (CAT→DBU, a +1 shift), verify the answer EPH for DOG by decoding it back with a −1 shift. Solution: Apply −1 to each letter of EPH: E→D, P→O, H→G. This gives back DOG exactly, confirming the +1 shift rule was applied correctly both ways. Answer: DOG (confirms the rule)
- Practice: In a certain code, BOOK is written as DQQM. Using the same rule, how will PAGE be coded? (Answer: RCIG (every letter shifts forward by 2))
- Practice: Using the mirror rule from the worked examples (A↔Z, B↔Y, C↔X…), how will the word BRAIN be coded? (Answer: YIZRM)
- Practice: Using the A=1, B=2, … Z=26 rule, how will the word MIND be coded? (Answer: 13-9-14-4)
- Practice: In a certain code, BIG is written as CKJ. Find the pattern (the shift increases by one for each letter), then code CAT using the same pattern. (Answer: DCW. C(+1)=D, A(+2)=C, T(+3)=W.)
- Practice: In a certain code, DOG is written as HPE (reverse the letters, then shift each by +1). Using the same rule, code CAT. (Answer: UBD. Reverse CAT to TAC, then shift each letter +1.)
- Practice: If PEN is coded as QFO (a +1 shift), verify this by decoding QFO back with a −1 shift. (Answer: PEN. Q−1=P, F−1=E, O−1=N — confirms the rule.)
- Practice: Using the A=1, B=2, … Z=26 rule, how will the word BOAT be coded? (Answer: 2-15-1-20.)

> **Quick revision:** Shift ciphers: every letter moves forward or backward by the same fixed number of places in the alphabet (e.g., CAT → DBU is a +1 shift on every letter); Mirror/reverse-alphabet codes: each letter is replaced by the letter the same distance from the OTHER end of the alphabet (A↔Z, B↔Y, C↔X, and so on); Numeric codes: each letter is replaced by its position number in the alphabet (A=1, B=2, … Z=26), or by some fixed arithmetic on that position; Word-substitution codes: whole words (not letters) are swapped for code-words, usually shown across two coded sentences that share a word — matching the repeated word to the repeated code cracks it; Some codes use a NON-uniform shift that depends on each letter's position in the word (e.g., 1st letter +1, 2nd letter +2, 3rd letter +3) rather than one constant amount — always check your guessed rule against EVERY letter of the given example before applying it, since a shift that looks constant for the first two letters can break on the third; A few questions reverse the order of the word's letters first and then apply a simple shift (the order you do these two steps in doesn't change the final result, since shifting is applied letter-by-letter regardless of position) — if a plain constant shift doesn't fit, check whether reversing the word first reveals one; After decoding, verify your answer by reversing your own rule on it — if that doesn't get you back to the original word or letter from the question, the rule you used was wrong

Coded Relationships Solved Questions

These questions hand you a symbol key for family relationships — "+" means "mother of," "×" means "husband of" — and ask you to trace a chain of two or three coded relationships through to the final answer. Here's the approach, six fully worked examples sharing one key, and a few to try yourself. Decode one symbol at a time, converting each into a plain-language relationship ("P + Q" becomes "P is the mother of Q") before trying to combine them. Draw or mentally build a small family tree exactly like a plain-language Blood Relations question — the only difference here is that the relationships arrive in coded form. Track gender carefully: a relationship like "brother of" or "son of" tells you the first person's gender directly, which is often the key to naming the final relationship correctly (uncle vs aunt, nephew vs niece). Work through the chain in the order given, converting the full expression into a short family-tree sketch before naming the final relationship — don't try to jump straight to the answer. When the chain has three coded links instead of two, decode and sketch them one link at a time, updating the same family tree as you go — trying to hold all three relationships in your head at once is where mistakes happen.

Examples

- If P + Q means P is the mother of Q, and Q × R means Q is the husband of R, how is P related to R? Solution: P is the mother of Q. Q is the husband of R, so Q is male and married to R. P is the mother of R's husband, which makes P the mother-in-law of R. Answer: P is the mother-in-law of R
- If A − B means A is the brother of B, and B + C means B is the mother of C, how is A related to C? Solution: A is the brother of B, so A is male and a sibling of B. B is the mother of C. A's sibling B is C's mother, which makes A the (maternal) uncle of C. Answer: A is the uncle of C

- If X ÷ Y means X is the son of Y, and Y – Z means Y is the brother of Z, how is X related to Z? Solution: X is the son of Y. Y is the brother of Z, so Y is male and a sibling of Z. X's father Y is Z's brother, which makes X the nephew of Z. Answer: X is the nephew of Z
- If M × N means M is the husband of N, and N + O means N is the mother of O, how is M related to O? Solution: M is the husband of N. N is the mother of O. The husband of O's mother is O's father. Answer: M is the father of O
- If A + B means A is the sister of B, B × C means B is the husband of C, and C – D means C is the mother of D, how is A related to D? Solution: A is the sister of B, so A is female and a sibling of B. B is the husband of C, and C is the mother of D — so B is D's father. A's sibling B is D's father, which makes A the (paternal) aunt of D. Answer: A is the aunt of D
- If P ÷ Q means P is the daughter of Q, and Q + R means Q is the sister of R, how is P related to R? Solution: P is the daughter of Q. Q is the sister of R, so Q is female and a sibling of R. P's mother Q is R's sister, which makes P the niece of R. Answer: P is the niece of R
- Practice: If P + Q means P is the mother of Q, and Q – R means Q is the brother of R, how is P related to R? (Answer: P is the mother of R)
- Practice: If A ÷ B means A is the son of B, and B × C means B is the husband of C, how is A related to C? (Answer: A is the son of C)
- Practice: If X – Y means X is the brother of Y, and Y ÷ Z means Y is the son of Z, how is X related to Z? (Answer: X is the son of Z)
- Practice: If X × Y means X is the father of Y, and Y – Z means Y is the sister of Z, how is X related to Z? (Answer: X is the father of Z)
- Practice: If J ÷ K means J is the son of K, and K × L means K is the husband of L, how is J related to L? (Answer: J is the son of L)

> **Quick revision:** Decode one symbol at a time, converting each into a plain-language relationship ("P + Q" becomes "P is the mother of Q") before trying to combine them; Draw or mentally build a small family tree exactly like a plain-language Blood Relations question — the only difference here is that the relationships arrive in coded form; Track gender carefully: a relationship like "brother of" or "son of" tells you the first person's gender directly, which is often the key to naming the final relationship correctly (uncle vs aunt, nephew vs niece); Work through the chain in the order given, converting the full expression into a short family-tree sketch before naming the final relationship — don't try to jump straight to the answer; When the chain has three coded links instead of two, decode and sketch them one link at a time, updating the same family tree as you go — trying to hold all three relationships in your head at once is where mistakes happen

Free practice questions: parikshasaathi.com/q/coding-decoding/

Direction Sense

Direction Sense: plotting the path

Direction Sense questions trace a path made of straight-line legs (so many km in one direction, then a turn, then more km in another direction) and ask for the final distance and/or direction from the start. The most reliable method is coordinate plotting: treat the starting point as (0,0), let North be +y, East be +x, South be -y and West be -x, and add each leg's movement to your running position.

Turns are relative to the direction you're currently facing, not to the compass: "turn right" rotates your facing direction 90° clockwise (North→East→South→West→North), and "turn left" rotates it 90° anticlockwise. A "U-turn" or "turns to face the opposite direction" flips your facing by 180°.

Once you have a final (x,y), the straight-line distance from the start is $\sqrt{(x^2+y^2)}$ — this is why most well-designed questions use Pythagorean triples (3-4-5, 6-8-10, 5-12-13) so the answer comes out as a clean whole number. If the final position lies exactly on one axis (x=0 or y=0), you can also name a precise direction ("due North", "due East", etc.) — if it lies off both axes, the honest answer is just the distance, since naming an exact diagonal direction needs more than "North-East" can precisely convey.

A separate sub-type skips distance entirely and just asks which way someone ends up facing after a sequence of turns — track the facing direction alone through each 90°/180° turn, no coordinates needed. And a classic real-world variant: a person's morning shadow points West (away from the sunrise in the East); if that shadow falls on a specific side of them (left/right), you can work out which way they're facing from that alone.

Examples

- A man walks 3 km East, then 4 km North. Position: (3,4). Distance from start = $\sqrt{(3^2+4^2)} = \sqrt{25} = 5$ km.
- A man walks 6 km North, turns right (now facing East), walks 6 km, turns right again (now facing South), walks 6 km. Position: (0,6)→(6,6)→(6,0). Final position (6,0) is 6 km due East of the start.
- A cyclist rides 12 km East, then 5 km North. Distance = $\sqrt{(12^2+5^2)} = \sqrt{169} = 13$ km (a 5-12-13 triple).
- Starting at X, a man walks 9 km North, turns right, walks 9 km, turns right, walks 9 km, turns right, walks 9 km. This traces a closed square (N, E, S, W, each 9 km) and returns exactly to X.
- Facing North, a man turns 90° clockwise (now East), then 180° (now West), then 90° anticlockwise (now South). No distance needed — just the final facing direction: South.
- A man walks 10 km North, then makes a U-turn and walks 4 km. Position: (0,10) then (0,6) after reversing 4 km. Final position is 6 km due North of the start.
- One morning, a man's shadow fell exactly to his left. Since a morning shadow points West (away from the sunrise in the East), and facing North puts West on your left hand, the man was facing North.
- B is 5 km North of A; C is 12 km East of B. Distance from A to C = $\sqrt{(12^2+5^2)} = \sqrt{169} = 13$ km — note the answer is a distance only, since C is not due North, South, East or West of A.

> **Quick revision:** Plot as coordinates: North=+y, East=+x. Right turn = 90° clockwise from current facing; left = 90° anticlockwise. Distance = $\sqrt{(x^2+y^2)}$. Only name an exact direction if the final point sits on one axis.

Direction Sense Solved Questions

Direction Sense questions turn into simple coordinate geometry once you plot each step on a grid — the only real skill is tracking turns correctly. This page covers that core approach, shadow-based direction questions, and the difference between total distance walked and straight-line distance from the start, with several fully worked examples. Treat East-West as one axis and North-South as the other, like a graph. Facing North, a right turn points you East and a left turn points you West. A right turn rotates your facing direction 90° clockwise (N→E→S→W→N); a left turn rotates it 90° counter-clockwise (N→W→S→E→N). A U-turn reverses it completely. For "how far from the start" questions, add up the net distance travelled along each axis separately, then apply the Pythagorean theorem: shortest distance = $\sqrt{(\text{net east-west}^2 + \text{net north-south}^2)}$. For "which direction from the start" questions, the signs of the net east-west and net north-south displacement tell you directly which way to point — and if both are non-zero and equal, the answer is an intercardinal direction (e.g. North-East). Shadow-direction questions use the sun's position instead of turns: in the morning the sun is in the East, so shadows fall towards the West; in the evening the sun is in the West, so shadows fall towards the East. Once you know which way the shadow falls, and whether that's to the person's left or right, you can work out which way they're facing. "Distance from the start" always means the straight-line (beeline) distance, found from the NET displacement via the Pythagorean theorem — this is different from the total distance actually walked, which is just the sum of every individual leg of the path. If a question doesn't explicitly say the person starts facing North, don't assume it — read the very first stated direction and build every later turn from that.

Examples

- A man walks 5 km towards North, then turns right and walks 3 km. Which direction is he facing now, and how far is he from his starting point? Solution: Facing North and turning right means he is now facing East. He has walked 5 km along the North-South axis and 3 km along the East-West axis — these are perpendicular, so distance from start = $\sqrt{(5^2 + 3^2)} = \sqrt{34} \approx 5.8$ km. Answer: Facing East, about 5.8 km ($\sqrt{34}$ km) from the start
- Raj walks 8 km East, then turns left and walks 6 km. How far is he from his starting point? Solution: Facing East and turning left means he is now facing North. He has walked 8 km East and 6 km North — perpendicular legs, so distance = $\sqrt{(8^2 + 6^2)} = \sqrt{100} = 10$ km. Answer: 10 km

- A woman starts from point A and walks 4 km North, then 3 km East, then 4 km South. How far, and in which direction, is she from point A now? Solution: Track net displacement on each axis: North-South = +4 (North) then −4 (South) = 0 net. East-West = +3 (East). The North and South legs cancel out exactly, leaving only the 3 km East. Answer: 3 km due East of A
- P starts from his house and walks 10 km South. He then turns left and walks 10 km. He turns left again and walks 5 km. He turns left once more and walks 10 km. How far is he from his house, and in which direction? Solution: Track facing direction through each left turn: South → (left) → East → (left) → North → (left) → West. Plot each leg (East = +x, North = +y): 10 km South → (0, −10). 10 km East → (10, −10). 5 km North → (10, −5). 10 km West → (0, −5). Final position (0, −5) relative to the house means he is 5 km away, directly South of it. Answer: 5 km due South of his house
- In the morning, a man's shadow falls exactly to his right. Which direction is he facing? Solution: In the morning, the sun is in the East, so shadows fall towards the West. His shadow (West) is to his right, so his right hand points West. Checking each facing direction: facing South, your right hand points West. Answer: South
- A man walks 6 km North, then 8 km East, then 6 km South. Find (a) the total distance he walked, and (b) his straight-line distance from the starting point. Solution: (a) Total distance walked is just the sum of every leg: 6 + 8 + 6 = 20 km. (b) For straight-line distance, use NET displacement: North-South nets to 6 − 6 = 0; East-West nets to 8. Straight-line distance = $\sqrt{(0^2 + 8^2)} = 8$ km. Answer: (a) 20 km total walked, (b) 8 km straight-line distance
- A man is facing West. He turns 90° clockwise and walks 5 km, then turns 90° clockwise again and walks 5 km. Find his distance and direction from the starting point. Solution: Facing West, a 90° clockwise turn brings him to face North (clockwise order: N→E→S→W→N, so after W comes N). He walks 5 km North: position (0, 5). Another 90° clockwise turn from North brings him to face East. He walks 5 km East: position (5, 5). Distance from start = $\sqrt{(5^2 + 5^2)} = \sqrt{50} = 5\sqrt{2} \approx 7.07$ km. Since the East and North components are equal, the direction is North-East. Answer: $5\sqrt{2}$ km ≈ 7.07 km, North-East of the start
- Practice: A man walks 5 km West, then turns left and walks 4 km. How far is he from his starting point (to one decimal place)? (Answer: ≈6.4 km ($\sqrt{41}$ km))
- Practice: A cyclist starts at point X, rides 6 km North, then 8 km East, then 6 km South. How far, and in which direction, is he from X? (Answer: 8 km due East of X)
- Practice: A girl walks 4 km East, turns right, walks 4 km, turns right again, and walks 4 km. How far is she from her starting point, and in which direction? (Answer: 4 km due South of the start)
- Practice: In the morning, a man's shadow falls exactly to his left. Which direction is he facing? (Answer: North. Morning shadows fall West; facing North, your left hand points West.)
- Practice: A man walks 9 km East, then 12 km North, then 9 km West. Find (a) the total distance walked, and (b) his straight-line distance from the start. (Answer: (a) 30 km, (b) 12 km (the East-West legs cancel out).)
- Practice: A man is facing South. He turns 90° anticlockwise and walks 6 km, then turns 90° anticlockwise again and walks 6 km. Find his distance and direction from the start. (Answer: $6\sqrt{2}$ km ≈ 8.49 km, North-East. (South → East → North, giving position (6,6).))
- Practice: A man walks 7 km South, then turns right and walks 7 km. How far is he from the start, and in which direction? (Answer: $7\sqrt{2}$ km ≈ 9.9 km, South-West. (South → West, giving position (−7,−7).))

> **Quick revision:** Treat East-West as one axis and North-South as the other, like a graph. Facing North, a right turn points you East and a left turn points you West; A right turn rotates your facing direction 90° clockwise (N→E→S→W→N); a left turn rotates it 90° counter-clockwise (N→W→S→E→N). A U-turn reverses it completely; For "how far from the start" questions, add up the net distance travelled along each axis separately, then apply the Pythagorean theorem: shortest distance = √(net east-west² + net north-south²); For "which direction from the start" questions, the signs of the net east-west and net north-south displacement tell you directly which way to point — and if both are non-zero and equal, the answer is an intercardinal direction (e.g. North-East); Shadow-direction questions use the sun's position instead of turns: in the morning the sun is in the East, so shadows fall towards the West; in the evening the sun is in the West, so shadows fall towards the East. Once you know which way the shadow falls, and whether that's to the person's left or right, you can work out which way they're facing; "Distance from the start" always means the straight-line (beeline) distance, found from the NET displacement via the Pythagorean theorem — this is different from the total distance actually walked, which is just the sum of every individual leg of the path; If a question doesn't explicitly say the person starts facing North, don't assume it — read the very first stated direction and build every later turn from that

Free practice questions: parikshasaathi.com/q/direction-sense/

Series Completion

Series completion: finding the pattern

Number series questions give you a sequence and ask for the next (or a missing) term. The entire skill is finding the right PATTERN FAMILY, tested roughly in this order of likelihood:

First, check the simple difference between consecutive terms — if it's constant, it's a plain arithmetic series (add the same amount each time). If the simple difference isn't constant, check whether the DIFFERENCES THEMSELVES form a pattern (often another arithmetic sequence, like 3, 5, 7, 9, increasing by 2 each time) — this catches series built from squares, cubes, or similar quadratic formulas (a series with constant SECOND differences is always expressible as an^2+bn+c for some constants).

If differences don't help, check the RATIO between consecutive terms (a constant ratio means a geometric series, each term multiplying the previous by the same factor). If neither differences nor ratios work, try splitting the sequence into two INTERLEAVED sub-sequences — odd positions and even positions each following their own simpler pattern independently (common in series like 1, 4, 2, 8, 3, 12, 4, ?).

A final family worth checking is Fibonacci-style: each term is the SUM of the two terms before it, rather than a fixed arithmetic or geometric step.

Whatever pattern you find, always verify it against EVERY term given, not just the first two or three — a pattern that fits the start can still quietly break later in the sequence, and a well-formed question never lets that happen with the genuinely correct pattern.

Examples

- 2, 5, 10, 17, 26, ?: differences are 3, 5, 7, 9 (increasing by 2 each time), so the next difference is 11 and the next term is 26+11=37 (this series is n^2+1).
- 3, 6, 12, 24, 48, ?: each term doubles the previous one (constant ratio 2), so the next term is 96.
- 1, 4, 2, 8, 3, 12, 4, ?: splitting into odd positions (1, 2, 3, 4) and even positions (4, 8, 12, ?), the even positions increase by 4 each time, so the next term is 16.
- 1, 1, 2, 3, 5, 8, ?: each term is the sum of the two before it (Fibonacci-style): 5+8=13.
- 5, 8, 4, 7, 3, 6, 2, ?: splitting into odd positions (5, 4, 3, 2) and even positions (8, 7, 6), both sub-sequences simply decrease by 1 each time — continuing the even-position sub-sequence 8, 7, 6 gives the next term, 5.
- A series with constant SECOND differences (differences of differences) is always a quadratic in disguise — recognizing this shortcut saves time versus guessing term by term.
- Always write down the differences (or ratios) explicitly as a separate row underneath the series — trying to spot the pattern purely by eye, without writing the differences down, is the most common source of careless errors.

> **Quick revision:** Check in order: constant difference (arithmetic) → differences-of-differences (quadratic) → constant ratio (geometric) → interleaved sub-sequences → Fibonacci-style sums. Verify the pattern against every given term, not just the first few.

Alphabet series: converting letters to positions

Alphabet series questions work exactly like number series once every letter is converted to its position (A=1, B=2… Z=26): find the numeric pattern using the same techniques (constant difference, difference-of-differences, interleaved sequences), then convert the final numeric answer back to a letter.

Common patterns include a fixed gap between consecutive letters' positions, an increasing or decreasing gap, two interleaved sequences running at once (often visible as two-letter terms like "AZ, BY, CX…" where the first letters move forward while the second letters move backward), and alternating-direction steps (forward some amount, then backward a different amount, repeating).

The one genuinely alphabet-specific trap is WRAPAROUND: if a computed position goes past 26 or below 1, wrap around the alphabet (position 27 = A again, position 0 = Z, position −1 = Y, and so on, using modular arithmetic with a cycle of 26). Always double check a position number against the 1-26 range before converting it to a letter — a position of 29, for instance, is letter C (29−26=3), not an invalid answer.

For two-letter terms, treat each letter-position within the term independently — don't assume both letters in a pair follow the same rule; verify each one's pattern separately against the given terms.

Examples

- B, D, F, H, J, ?: positions are 2, 4, 6, 8, 10 (each +2), so the next is 12 = L.
- A, C, F, J, O, ?: differences are 2, 3, 4, 5 (increasing by 1 each time), so the next difference is 6: position 15+6=21 = U.
- AZ, BY, CX, DW, ?: first letters move forward (A, B, C, D… positions 1,2,3,4), second letters move backward (Z, Y, X, W… positions 26,25,24,23) — the next pair is E (position 5) and V (position 22): EV.
- C, F, E, H, G, J, ?: positions alternate +3 then −1 (3,6,5,8,7,10…); the next step is −1, giving position 9 = I.
- B, D, G, K, P, ?: differences are 2, 3, 4, 5 (increasing by 1), so the next difference is 6: position 16+6=22 = V.
- If a computed position is 28, that wraps around past Z (26): 28−26=2, which is B — always reduce a position above 26 by subtracting 26 (or more, for larger overshoots) before naming the letter.
- ZA, YB, XC, WD, ?: first letters move backward from Z (positions 26,25,24,23…), second letters move forward from A (positions 1,2,3,4…) — the next pair is V (position 22) and E (position 5): VE.

> **Quick revision:** Convert letters to positions (A=1…Z=26), solve as a number series using the same pattern-finding techniques, convert back to a letter. Watch for wraparound past Z (subtract 26) or before A (add 26). In two-letter terms, verify each position's pattern independently.

Number Series Solved Questions

Number Series questions test pattern recognition — the pattern is usually one of a small set of standard types, and finding which one applies is the whole game. This page covers that approach, plus two-operation repeating cycles and square/cube/prime-based series, with several fully worked examples covering the patterns that come up most. First check the simple difference between consecutive terms. If that’s constant, you have a plain arithmetic series. If the plain difference isn’t constant, check whether the DIFFERENCES themselves follow a pattern (e.g., 3, 5, 7, 9, …) — this catches series built from squares, cubes or similar formulas. If differences don’t help, check the ratio between consecutive terms (geometric series), or try splitting the series into its odd-position and even-position terms separately — many series are really two simpler series interleaved. Always check your guessed pattern against every given term, not just the first two or three — a pattern that fits the start can still break later in the sequence. Some series repeat a two-operation CYCLE rather than alternating between two fixed amounts on the raw numbers — e.g. "×2, then −3", over and over. If neither a constant difference nor a constant ratio fits, check whether consecutive PAIRS of steps repeat the same two operations. A few series are built from squares, cubes or prime numbers, sometimes with a constant added: if the gaps between terms grow in a clean, evenly-increasing way (like 2, 3, 4, 5,

… apart), suspect a square-based series (since consecutive squares differ by consecutive odd numbers, offset by a constant doesn't change that pattern of growth); check cubes or the prime list directly if the terms look familiar.

Examples

- Find the next number in the series: 2, 5, 10, 17, 26, ? Solution: Differences between consecutive terms: 5−2=3, 10−5=5, 17−10=7, 26−17=9. The differences themselves are 3, 5, 7, 9 — increasing by 2 each time, so the next difference is 11. Next term = 26 + 11 = 37. (This series is actually $n^2 + 1$ for n = 1, 2, 3, …) Answer: 37
- Find the next number in the series: 3, 6, 12, 24, 48, ? Solution: Each term is double the previous one: 6/3=2, 12/6=2, 24/12=2, 48/24=2. Next term = 48 × 2 = 96. Answer: 96
- Find the missing number in the series: 1, 4, 2, 8, 3, 12, 4, ? Solution: This looks irregular as one sequence, so split it into odd-position and even-position terms. Odd positions (1st, 3rd, 5th, 7th): 1, 2, 3, 4 — increasing by 1 each time. Even positions (2nd, 4th, 6th, 8th): 4, 8, 12, ? — increasing by 4 each time, so the next (8th) term is 16. Answer: 16
- Find the next number in the series: 5, 8, 4, 7, 3, 6, 2, ? Solution: Check the pattern of operations rather than a single constant difference: 5→8 is +3, 8→4 is −4, 4→7 is +3, 7→3 is −4, 3→6 is +3, 6→2 is −4. The operations alternate +3, −4, +3, −4, … and the last one shown was −4 (6→2), so the next one is +3. Next term = 2 + 3 = 5. Answer: 5
- Find the next number in the series: 3, 6, 4, 8, 6, 12, 10, ? Solution: A single alternating ±amount doesn't fit. Try a two-operation cycle instead: 3→6 is ×2, 6→4 is −2, 4→8 is ×2, 8→6 is −2, 6→12 is ×2, 12→10 is −2. The cycle "×2, then −2" repeats consistently. The last operation shown was −2 (12→10), so the next is ×2. Next term = 10 × 2 = 20. Answer: 20
- Find the next number in the series: 0, 1, 8, 27, 64, ? Solution: These are perfect cubes: 0^3=0, 1^3=1, 2^3=8, 3^3=27, 4^3=64. The next cube is 5^3 = 125. Answer: 125
- Find the next number in the series: 2, 3, 5, 7, 11, ? Solution: These are the prime numbers in order: 2, 3, 5, 7, 11. The next prime number is 13. Answer: 13
- Practice: Find the next number in the series: 3, 7, 13, 21, 31, ? (Answer: 43 (differences 4, 6, 8, 10, 12))
- Practice: Find the next number in the series: 2, 6, 18, 54, ? (Answer: 162 (each term × 3))
- Practice: Find the missing number in the series: 2, 3, 4, 6, 6, 9, 8, ? (Answer: 12 (odd positions +2 each: 2,4,6,8; even positions +3 each: 3,6,9,12))
- Practice: Find the next number in the series: 4, 8, 5, 10, 7, 14, 11, ? (Answer: 22. Two-operation cycle "×2, then −3": 4→8→5→10→7→14→11→22.)
- Practice: Find the next number in the series: 1, 8, 27, 64, 125, ? (Answer: 216 (= 6^3))
- Practice: Find the missing number in the series: 2, 3, 5, 7, ?, 13 (Answer: 11 (the prime numbers in order))
- Practice: Find the next number in the series: 3, 6, 11, 18, 27, ? (Answer: 38. Differences are 3, 5, 7, 9, 11 (this series is $n^2 + 2$).)

> **Quick revision:** First check the simple difference between consecutive terms. If that’s constant, you have a plain arithmetic series; If the plain difference isn’t constant, check whether the DIFFERENCES themselves follow a pattern (e.g., 3, 5, 7, 9, …) — this catches series built from squares, cubes or similar formulas; If differences don’t help, check the ratio between consecutive terms (geometric series), or try splitting the series into its odd-position and even-position terms separately — many series are really two simpler series interleaved; Always check your guessed pattern against every given term, not just the first two or three — a pattern that fits the start can still break later in the sequence; Some series repeat a two-operation CYCLE rather than alternating between two fixed amounts on the raw numbers — e.g. "×2, then −3", over and over. If neither a constant difference nor a constant ratio fits, check whether consecutive PAIRS of steps repeat the same two operations; A few series are built from squares, cubes or prime numbers, sometimes with a constant added: if the gaps between terms grow in a clean, evenly-increasing way (like 2, 3, 4, 5, … apart), suspect a square-based series (since consecutive squares differ by consecutive odd numbers, offset by a constant doesn't change that pattern of growth); check cubes or the prime list directly if the terms look familiar

Alphabet Series Solved Questions

Alphabet Series questions work exactly like Number Series, once you convert each letter to its position number (A=1, B=2, … Z=26) — find the numeric pattern, then convert the answer back to a letter. Here’s the approach, six fully worked examples covering the patterns that come up most, and a few to try yourself. Convert every letter to its

position number first (A=1, B=2, … Z=26). Solve the resulting number pattern exactly as you would for Number Series, then convert the final answer back to a letter. Common patterns: a fixed gap between letters (skip 1, skip 2…), an increasing or decreasing gap (mirroring Number Series' "differences of differences"), two interleaved sequences running at once, or blocks of consecutive letters whose starting points follow their own pattern. Some series alternate forward and backward movement (e.g., +3 then −1, repeating) — treat this the same as an alternating-operations Number Series pattern, just in letter-position space. Watch for a position going past 26 or below 1 — in that case the series wraps around the alphabet (26 wraps to 1, or 1 wraps to 26), though this is relatively rare and worth double-checking for before assuming a pattern is broken. Write the position number above or beside each letter as you go, rather than tracking it mentally — this is the single biggest time-saver, especially past J (10) or T (20), where mental counting becomes unreliable under exam pressure.

Examples

- Find the next letter in the series: B, D, F, H, J, ? Solution: Positions: B=2, D=4, F=6, H=8, J=10 — each one is 2 more than the last. Next position = 10 + 2 = 12 = L. Answer: L
- Find the missing letter in the series: A, C, F, J, O, ? Solution: Positions: A=1, C=3, F=6, J=10, O=15. Differences between them: 2, 3, 4, 5 — each one is 1 more than the last. Next difference = 6. Next position = 15 + 6 = 21 = U. Answer: U
- Find the next term in the series: AZ, BY, CX, DW, ? Solution: Split into two interleaved sequences: the first letters (A, B, C, D) move forward by 1 each time, and the second letters (Z, Y, X, W) move backward by 1 each time. Next first letter: D + 1 = E. Next second letter: W − 1 = V. Answer: EV
- Find the next letter in the series: C, F, E, H, G, J, ? Solution: Positions: C=3, F=6, E=5, H=8, G=7, J=10. Check the pattern of steps, not a single constant gap: C→F is +3, F→E is −1, E→H is +3, H→G is −1, G→J is +3. The steps alternate +3, −1, +3, −1, … and the last one shown was +3 (G→J), so the next step is −1. Next position = 10 − 1 = 9 = I. Answer: I
- Find the next term in the series: ABC, EFG, IJK, ? Solution: Each block is three consecutive letters. Look at the starting letter of each block: A=1, E=5, I=9 — each is 4 more than the last. Next starting position = 9 + 4 = 13 = M, and the block continues consecutively from there: M, N, O. Answer: MNO
- Find the next letter in the series: Z, X, V, T, ? Solution: Positions: Z=26, X=24, V=22, T=20 — each one is 2 less than the last (moving backward through the alphabet). Next position = 20 − 2 = 18 = R. Answer: R
- Practice: Find the next letter in the series: C, F, I, L, O, ? (Answer: R (each position is 3 more than the last))
- Practice: Find the missing letter in the series: B, D, G, K, P, ? (Answer: V (differences are 2, 3, 4, 5, so the next difference is 6))
- Practice: Find the next term in the series: ZA, YB, XC, WD, ? (Answer: VE (first letters move backward by 1, second letters move forward by 1))
- Practice: Find the next letter in the series: D, H, L, P, ? (Answer: T (each position is 4 more than the last: 4, 8, 12, 16, 20))
- Practice: Find the next term in the series: DF, GI, JL, ? (Answer: MO (each pair has an internal gap of 2; the first letters of each pair move forward by 3: D, G, J, M))

Quick revision: Convert every letter to its position number first (A=1, B=2, … Z=26). Solve the resulting number pattern exactly as you would for Number Series, then convert the final answer back to a letter; Common patterns: a fixed gap between letters (skip 1, skip 2…), an increasing or decreasing gap (mirroring Number Series' "differences of differences"), two interleaved sequences running at once, or blocks of consecutive letters whose starting points follow their own pattern; Some series alternate forward and backward movement (e.g., +3 then −1, repeating) — treat this the same as an alternating-operations Number Series pattern, just in letter-position space; Watch for a position going past 26 or below 1 — in that case the series wraps around the alphabet (26 wraps to 1, or 1 wraps to 26), though this is relatively rare and worth double-checking for before assuming a pattern is broken; Write the position number above or beside each letter as you go, rather than tracking it mentally — this is the single biggest time-saver, especially past J (10) or T (20), where mental counting becomes unreliable under exam pressure

Wrong Number Series Solved Questions

This is Number Series run in reverse — instead of extending a pattern, you're given a sequence with one term that breaks it, and the job is to find which term doesn't belong. Here's the approach, six fully worked examples covering the patterns that come up most, and a few to try yourself. Check the differences between consecutive terms first. If they form a recognisable pattern themselves (constant, or increasing by a fixed amount, or odd numbers), one term breaking that pattern is your answer. If differences don't reveal a pattern, check the ratio between consecutive terms — a geometric series (each term × a fixed number) is common, and a wrong term will show an inconsistent ratio. Check against a known formula family — squares (1, 4, 9, 16, 25, …), n^2 + a constant, or n(n+1) — since several standard series are built directly from one of these. Once you spot the pattern from the terms that DO fit, calculate what the odd-one-out term should have been, rather than just naming which position looks wrong — this confirms your pattern is actually correct. If neither a constant difference nor a constant ratio fits, check whether the DIFFERENCES themselves form a geometric pattern (doubling each time) — common in series built by repeatedly adding a growing amount.

Examples

- Find the wrong number in the series: 2, 5, 10, 17, 26, 37, 50, 64 Solution: The differences between consecutive terms are 3, 5, 7, 9, 11, 13, … — each 2 more than the last (this is the $n^2 + 1$ series: 1^2+1, 2^2+1, 3^2+1, …). Following the pattern, the 8th term should be $8^2 + 1 = 65$, but 64 is given instead. Answer: 64 (should be 65)
- Find the wrong number in the series: 3, 6, 12, 24, 48, 90, 192 Solution: Each term should be double the previous one: 3, 6, 12, 24, 48, 96, 192. The 6th term should be 48 × 2 = 96, but 90 is given instead. Answer: 90 (should be 96)
- Find the wrong number in the series: 1, 4, 9, 16, 24, 36, 49 Solution: These are perfect squares: 1^2, 2^2, 3^2, 4^2, 5^2, 6^2, 7^2 = 1, 4, 9, 16, 25, 36, 49. The 5th term should be $5^2 = 25$, but 24 is given instead. Answer: 24 (should be 25)
- Find the wrong number in the series: 5, 10, 17, 26, 37, 51, 65 Solution: The differences are 5, 7, 9, 11, 13, 15 — each 2 more than the last. Following the pattern, the 6th term should be 37 + 13 = 50, but 51 is given instead. Answer: 51 (should be 50)
- Find the wrong number in the series: 2, 6, 18, 54, 160, 486 Solution: Each term should be the previous term × 3: 2, 6, 18, 54, 162, 486. The 5th term should be 54 × 3 = 162, but 160 is given instead. Answer: 160 (should be 162)
- Find the wrong number in the series: 7, 13, 25, 49, 97, 191 Solution: The differences are 6, 12, 24, 48, 94 — each difference should double the previous one (6, 12, 24, 48, 96). The 6th term should be 97 + 96 = 193, but 191 is given instead. Answer: 191 (should be 193)
- Practice: Find the wrong number in the series: 4, 9, 16, 25, 35, 49, 64 (Answer: 35 (should be 36))
- Practice: Find the wrong number in the series: 2, 6, 12, 20, 32, 42, 56 (Answer: 32 (should be 30))
- Practice: Find the wrong number in the series: 7, 14, 28, 55, 112, 224 (Answer: 55 (should be 56))
- Practice: Find the wrong number in the series: 1, 2, 6, 24, 120, 620, 5040 (Answer: 620 (should be 720 — the series is n!, and 6! = 720))
- Practice: Find the wrong number in the series: 3, 9, 27, 81, 242, 729 (Answer: 242 (should be 243 — the series is 3^n, and $3^5 = 243$))

> **Quick revision:** Check the differences between consecutive terms first. If they form a recognisable pattern themselves (constant, or increasing by a fixed amount, or odd numbers), one term breaking that pattern is your answer; If differences don't reveal a pattern, check the ratio between consecutive terms — a geometric series (each term × a fixed number) is common, and a wrong term will show an inconsistent ratio; Check against a known formula family — squares (1, 4, 9, 16, 25, …), n^2 + a constant, or n(n+1) — since several standard series are built directly from one of these; Once you spot the pattern from the terms that DO fit, calculate what the odd-one-out term should have been, rather than just naming which position looks wrong — this confirms your pattern is actually correct; If neither a constant difference nor a constant ratio fits, check whether the DIFFERENCES themselves form a geometric pattern (doubling each time) — common in series built by repeatedly adding a growing amount

Alphanumeric Series Solved Questions

Each term pairs a letter with a number, and the two run as separate, parallel patterns — solve them independently using Alphabet Series and Number Series methods, then combine the results. Here's the approach, six fully worked

examples, and a few to try yourself. Split each term into its letter part and its number part, and track them as two separate sequences — don't try to find one pattern connecting both at once. Solve the letter sequence exactly like Alphabet Series: convert to position numbers (A=1, B=2, …) and find the gap between consecutive positions. Solve the number sequence exactly like Number Series: check the difference, the ratio, or a formula family (squares, n(n+1), doubling) between consecutive terms. Once you've found both patterns separately, apply each one once more to get the letter and the number of the missing term, then combine them into the final answer. The letter and number parts don't have to move in the same direction or at the same rate — one can increase while the other decreases, or one can use a fixed gap while the other multiplies; solve each strictly on its own evidence.

Examples

- Find the missing term: A1, C4, E9, G16, ? Solution: Letters: A, C, E, G — each position +2 (1, 3, 5, 7), so the next is position 9 = I. Numbers: 1, 4, 9, 16 — these are 1^2, 2^2, 3^2, 4^2, so the next is $5^2 = 25$. Answer: I25
- Find the missing term: B2, D6, F12, H20, ? Solution: Letters: B, D, F, H — each position +2 (2, 4, 6, 8), so the next is position 10 = J. Numbers: 2, 6, 12, 20 — these are 1×2, 2×3, 3×4, 4×5, so the next is 5×6 = 30. Answer: J30
- Find the missing term: Z25, X20, V15, T10, ? Solution: Letters: Z, X, V, T — each position −2 (26, 24, 22, 20), so the next is position 18 = R. Numbers: 25, 20, 15, 10 — each −5, so the next is 5. Answer: R5
- Find the missing term: C6, F12, I18, L24, ? Solution: Letters: C, F, I, L — each position +3 (3, 6, 9, 12), so the next is position 15 = O. Numbers: 6, 12, 18, 24 — each +6, so the next is 30. Answer: O30
- Find the missing term: D4, H8, L12, P16, ? Solution: Letters: D, H, L, P — each position +4 (4, 8, 12, 16), so the next is position 20 = T. Numbers: 4, 8, 12, 16 — each +4, so the next is 20. Answer: T20
- Find the missing term: Y5, V10, S15, P20, ? Solution: Letters: Y, V, S, P — each position −3 (25, 22, 19, 16), so the next is position 13 = M. Numbers: 5, 10, 15, 20 — each +5, so the next is 25. Answer: M25
- Practice: Find the missing term: A2, D8, G18, J32, ? (Answer: M50)
- Practice: Find the missing term: B4, D8, F16, H32, ? (Answer: J64)
- Practice: Find the missing term: E10, H16, K22, N28, ? (Answer: Q34)
- Practice: Find the missing term: B3, E9, H27, K81, ? (Answer: N243 (letters +3 each step; numbers ×3 each step))
- Practice: Find the missing term: F12, J9, N6, R3, ? (Answer: V0 (letters +4 each step; numbers −3 each step))

> **Quick revision:** Split each term into its letter part and its number part, and track them as two separate sequences — don't try to find one pattern connecting both at once; Solve the letter sequence exactly like Alphabet Series: convert to position numbers (A=1, B=2, …) and find the gap between consecutive positions; Solve the number sequence exactly like Number Series: check the difference, the ratio, or a formula family (squares, n(n+1), doubling) between consecutive terms; Once you've found both patterns separately, apply each one once more to get the letter and the number of the missing term, then combine them into the final answer; The letter and number parts don't have to move in the same direction or at the same rate — one can increase while the other decreases, or one can use a fixed gap while the other multiplies; solve each strictly on its own evidence

Letter Pairs with Equal Alphabet Gap

This topic asks a precise, mechanical question: for a pair of letters in a word, does the number of letters separating them IN THE WORD match the number of letters separating them IN THE ALPHABET? Here's the exact rule, six fully worked examples, and a few to try yourself. For any two letters in the word, "letters between them in the word" = (their position gap in the word) − 1. For two letters three spots apart in the word, that's 2 letters between them. "Letters between them in the alphabet" = (the difference between their alphabet positions, A=1 … Z=26) − 1. For B and E, positions 2 and 5, that's 2 letters between them (C, D). Check every pair of letters in the word (not just adjacent ones), and count a pair when the word-gap equals the alphabet-gap. Work systematically: list each letter's position in the word and its alphabet position side by side first, then compare gaps pair by pair — trying to do this from memory invites errors. This rule only meaningfully applies to pairs of two DIFFERENT letters — if a word repeats the same letter, that letter paired with its other occurrence has no real "alphabet gap" to compare, so focus on pairs of distinct letter values.

Examples

- How many pairs of letters in the word COUNTRY have as many letters between them in the word as they have between them in the English alphabet? Solution: C-O-U-N-T-R-Y: positions 1-7. Checking all pairs, two qualify. U (position 3) and R (position 6): word-gap = 6–3–1 = 2. Alphabet: U=21, R=18, gap = 21–18–1 = 2. Match. U (position 3) and Y (position 7): word-gap = 7–3–1 = 3. Alphabet: U=21, Y=25, gap = 25–21–1 = 3. Match. Answer: 2
- How many such pairs are there in the word MONKEY? Solution: M-O-N-K-E-Y: positions 1-6. Checking all pairs, one qualifies. O (position 2) and N (position 3): word-gap = 3–2–1 = 0 (adjacent). Alphabet: O=15, N=14, gap = 15–14–1 = 0. Match. Answer: 1
- How many such pairs are there in the word PATIENT? Solution: P-A-T-I-E-N-T: positions 1-7. Checking every pair against the rule, none of them have a matching word-gap and alphabet-gap. Answer: 0
- How many such pairs are there in the word HORIZON? Solution: H-O-R-I-Z-O-N: positions 1-7. Checking all pairs, four qualify. H (1) & N (7): word-gap = 5, alphabet gap (H=8, N=14) = 5. Match. R (3) & the O at position 6: word-gap = 2, alphabet gap (R=18, O=15) = 2. Match. R (3) & N (7): word-gap = 3, alphabet gap (R=18, N=14) = 3. Match. The O at position 6 & N (7): word-gap = 0, alphabet gap (O=15, N=14) = 0. Match. Answer: 4
- How many such pairs are there in the word NATURE? Solution: N-A-T-U-R-E: positions 1-6 (N=14, A=1, T=20, U=21, R=18, E=5). Checking all 15 pairs systematically, four qualify. N(1) & R(5): word-gap = 3, alphabet gap = |18–14|–1 = 3. Match. A(2) & E(6): word-gap = 3, alphabet gap = |5–1|–1 = 3. Match. T(3) & U(4): word-gap = 0, alphabet gap = |21–20| –1 = 0. Match. T(3) & R(5): word-gap = 1, alphabet gap = |20–18|–1 = 1. Match. Answer: 4
- How many such pairs are there in the word FLOWER? Solution: F-L-O-W-E-R: positions 1-6 (F=6, L=12, O=15, W=23, E=5, R=18). Checking all 15 pairs systematically, only one qualifies. O(3) & R(6): word-gap = 2, alphabet gap = |18–15| –1 = 2. Match. Answer: 1
- Practice: How many such pairs are there in the word GARDEN? (Answer: 2)
- Practice: How many such pairs are there in the word MINUTES? (Answer: 3)
- Practice: How many such pairs are there in the word CHICKEN? (Answer: 4)
- Practice: How many such pairs are there in the word WINTER? (Answer: 2 (W&R, and T&R both qualify))
- Practice: How many such pairs are there in the word MASTER? (Answer: 3 (M&R, S&T, and T&R all qualify))

> **Quick revision:** For any two letters in the word, "letters between them in the word" = (their position gap in the word) – 1. For two letters three spots apart in the word, that's 2 letters between them; "Letters between them in the alphabet" = (the difference between their alphabet positions, A=1 … Z=26) – 1. For B and E, positions 2 and 5, that's 2 letters between them (C, D); Check every pair of letters in the word (not just adjacent ones), and count a pair when the word-gap equals the alphabet-gap; Work systematically: list each letter's position in the word and its alphabet position side by side first, then compare gaps pair by pair — trying to do this from memory invites errors; This rule only meaningfully applies to pairs of two DIFFERENT letters — if a word repeats the same letter, that letter paired with its other occurrence has no real "alphabet gap" to compare, so focus on pairs of distinct letter values

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Syllogism

Syllogism: conclusions from statements

Syllogism questions give you statements about categories ("All A are B", "Some A are B", "No A are B", "Some A are not B") and ask which conclusions are DEFINITELY true in every possible scenario consistent with the statements — not just plausible or common-sense.

The most reliable way to check a conclusion is the Venn-diagram (region) method: draw circles for each category and think about which overlap patterns the statements actually force, versus which they merely allow. A statement like "All A are B" forces the A-circle entirely inside the B-circle — nothing is left to chance. "Some A are B" only forces SOME overlap — it does NOT say anything about the rest of A or the rest of B. "No A are B" forces the circles to be completely separate. "Some A are not B" forces at least part of A to sit outside B, but says nothing about whether any A is inside B either.

A conclusion "follows" only if it's true in EVERY diagram consistent with the statements — if you can draw even one valid diagram where the conclusion is false, it doesn't follow. This is why "All A are B, Some B are C" proves NOTHING about A and C: the C's that overlap B could be entirely outside A, in a perfectly valid diagram.

A "No" relationship is symmetric: "No A are B" and "No B are A" are logically the same fact, just stated in the opposite order — so if one follows, so does the other, automatically, without further proof. Watch especially for chains that LOOK like they transfer certainty ("All A are B, All B are C" really does give "All A are C") versus chains that only FEEL like they should ("Some A are B, Some B are C" proves nothing about A and C at all).

Examples

- All cats are dogs. All dogs are cows. Conclusion: All cats are cows — follows, since the "All" chain transfers directly: the cat-circle sits inside the dog-circle, which sits inside the cow-circle.
- Some pens are books. All books are tables. Conclusions: Some pens are tables (follows — the pens that are books are also tables); Some tables are pens (follows too, the same overlap stated the other way).
- All teachers are readers. Some readers are writers. Conclusion: Some teachers are writers — does NOT follow. The readers who are writers could be entirely different people from the readers who are teachers; nothing forces an overlap between teachers and writers specifically.
- No actors are singers. All dancers are singers. Conclusions: No dancers are actors, and (automatically, since "No" is symmetric) No actors are dancers — both follow, since every dancer is a singer and no singer is an actor.
- Some farmers are fishermen. No fishermen are sailors. Conclusion: Some farmers are not sailors — follows (the farmer-fishermen can't be sailors). But "No farmers are sailors" does NOT follow — it says nothing about farmers who aren't fishermen.
- All soldiers are officers. All officers are leaders. Conclusion: All soldiers are leaders — follows directly by chaining the two "All" statements. "Some leaders are soldiers" follows too: every soldier is a leader, and these questions always assume that each named category has at least one member, so at least one leader is a soldier. ("All leaders are soldiers" would NOT follow — most leaders could be non-soldiers.)
- All pilots are graduates. All pilots are trainees. Conclusion: Some graduates are trainees — follows. Every category named in the statements is assumed to have at least one member (the SSC/IBPS convention), so at least one pilot exists, and that pilot is a graduate who is also a trainee. By conversion, "Some trainees are graduates" follows as well.
- E ≤ F ≤ G-style weak chains in disguise: "All A are B, Some C are not B" gives "Some C are not A" (since anything outside B is also outside A, as A is entirely inside B) — but NOT the stronger "No C are A", since the C's that ARE in B might still include some A's.

> **Quick revision:** A conclusion follows only if true in EVERY valid diagram. "All" chains transfer directly; "Some" statements never guarantee overlap beyond what's stated. "No A are B" is symmetric with "No B are A". Every category named in the statements is assumed to have at least one member (SSC/IBPS convention), so "All A are B" also gives "Some B are A" — but never "All B are A".

Syllogism Solved Questions

Syllogism questions test pure logic, not real-world knowledge — you have to accept the given statements as true even when they sound absurd, and judge only whether each conclusion is logically forced. This page covers that approach, the standard conversion rules, the "either/or" special case, and chaining three statements together, with several fully worked examples covering the patterns that trip people up most. Treat every statement as 100% true, no matter how odd it sounds ("All cats are dogs" is a valid statement for this question) — judge conclusions purely on logic, not on what you know about the real world. Four statement types matter: "All A are B", "No A are B", "Some A are B", and "Some A are not B". "Some A are B" can always be flipped to "Some B are A" — this conversion is always valid. But "All A are B" can NOT be flipped to "All B are A" — that is a classic trap. "All A are B" can only be weakened to "Some B are A" (these questions assume A has at least one member). Sketch a quick Venn diagram for each conclusion and check whether it holds in every possible arrangement of the circles, not just the most obvious one. If you can draw even one valid arrangement where the conclusion is false, it does not follow. The "either/or" special case: if two conclusions are exact complements of each other (one says "No X are Y", the other says "Some X are Y" — between them, they cover every possibility, since the X-Y overlap is either zero or not), and

NEITHER follows on its own, check whether at least one of them must still be true. If so, the answer is "Either conclusion I or II follows," even though neither follows individually. With three statements chained together, work out what the first two combine to tell you, and only then bring in the third — don't try to combine all three at once. A chain of "All...All..." stays strong all the way through, but a "Some" anywhere in the chain usually breaks it: the "some" overlap isn't guaranteed to land inside the earlier subset relationship.

Examples

- Statements: All cats are dogs. All dogs are cows. Conclusions: I. All cats are cows. II. All cows are cats. Which conclusion(s) logically follow? Solution: All cats are dogs means the "cats" circle sits entirely inside the "dogs" circle. All dogs are cows means the "dogs" circle sits entirely inside the "cows" circle. So the "cats" circle is entirely inside the "cows" circle too — Conclusion I is forced in every possible arrangement. Conclusion II is not forced — the "cows" circle could easily be much bigger, containing cows that are neither dogs nor cats. It does not follow. Answer: Only Conclusion I follows
- Statements: Some pens are books. All books are tables. Conclusions: I. Some pens are tables. II. Some tables are pens. Which conclusion(s) logically follow? Solution: Some pens are books means the "pens" circle and "books" circle overlap. All books are tables means the "books" circle sits entirely inside the "tables" circle. The pens that overlap with books are therefore also inside tables — so some pens are tables. Conclusion I is forced. "Some pens are tables" (just shown true) can always be flipped to "Some tables are pens" — this flip is always valid for "Some…are" statements. So Conclusion II follows too. Answer: Both conclusions follow
- Statements: No apples are oranges. Some oranges are fruits. Conclusions: I. Some fruits are not apples. II. No apples are fruits. Which conclusion(s) logically follow? Solution: No apples are oranges means the "apples" circle and "oranges" circle do not overlap at all. Some oranges are fruits means part of the "oranges" circle overlaps with the "fruits" circle — and that overlapping part, being entirely within oranges, cannot contain any apples (since apples and oranges never overlap). So those particular fruits (the ones that are oranges) are definitely not apples — "Some fruits are not apples" is forced. Conclusion I follows. "No apples are fruits" is not forced — apples could still overlap with fruits through some path that has nothing to do with oranges; nothing in the statements rules that out. Conclusion II does not follow. Answer: Only Conclusion I follows
- Statements: All books are pens. No pen is a pencil. Conclusions: I. No book is a pencil. II. Some pens are books. Which conclusion(s) logically follow? Solution: All books are pens means the "books" circle sits entirely inside the "pens" circle. No pen is a pencil means the "pens" circle and "pencils" circle do not overlap at all. Since the "books" circle is entirely inside the "pens" circle, and the "pens" circle never touches the "pencils" circle, the "books" circle can’t touch the "pencils" circle either — "No book is a pencil" is forced. Conclusion I follows. "All books are pens" guarantees every book is a pen, and since books exist, at least some pens are books — "Some pens are books" is forced. Conclusion II follows. Answer: Both conclusions follow
- Statements: Some actors are singers. No singer is a dancer. Conclusions: I. No actor is a dancer. II. Some actors are dancers. Which conclusion(s) follow? Solution: The actors who are also singers are definitely not dancers (since no singer is a dancer). But non-singer actors are completely unconstrained — they could all be dancers, or none of them could. So Conclusion I ("No actor is a dancer") is too strong — it isn't forced. Conclusion II ("Some actors are dancers") also isn't forced — it's entirely possible that zero actors are dancers. But these two conclusions are exact complements: either SOME actor is a dancer, or NO actor is — one of the two must be true. Since neither follows alone but one of them must hold, the answer is "Either I or II follows." Answer: Either Conclusion I or Conclusion II follows
- Statements: All mangoes are fruits. All fruits are healthy foods. Some healthy foods are expensive. Conclusion: Some mangoes are expensive. Does it follow? Solution: Combining the first two statements: all mangoes are healthy foods (mangoes sit entirely inside healthy foods). But "some healthy foods are expensive" only guarantees an overlap SOMEWHERE inside healthy foods — that overlap might sit entirely outside the mango subset. So "Some mangoes are expensive" is not forced — it does not follow. Answer: Does not follow
- Statements: All mangoes are fruits. All fruits are healthy foods. All healthy foods are nutritious. Conclusion: All mangoes are nutritious. Does it follow? Solution: This chain is "All...All...All" throughout, so transitivity carries all the way through: mangoes $\subseteq$ fruits $\subseteq$ healthy foods $\subseteq$ nutritious things. So all mangoes are nutritious — the conclusion follows. Answer: Follows
- Practice: Statements: All mobiles are laptops. Some laptops are tablets. Conclusions: I. Some mobiles are tablets. II. Some tablets are mobiles. Which conclusion(s) follow? (Answer: Neither conclusion follows (the "some laptops are

tablets" overlap need not touch mobiles at all))

- Practice: Statements: Some doctors are engineers. No engineer is a teacher. Conclusions: I. Some doctors are not teachers. II. No doctor is a teacher. Which conclusion(s) follow? (Answer: Only Conclusion I follows)
- Practice: Statements: All squares are rectangles. All rectangles are polygons. Conclusions: I. All squares are polygons. II. Some polygons are squares. Which conclusion(s) follow? (Answer: Both conclusions follow)
- Practice: Statements: Some pens are pencils. No pencil is an eraser. Conclusions: I. No pen is an eraser. II. Some pens are erasers. Which conclusion(s) follow? (Answer: Either Conclusion I or II follows (they are exact complements, and one must be true).)
- Practice: Statements: All tigers are animals. All animals are living things. Some living things are plants. Conclusion: Some tigers are plants. Does it follow? (Answer: Does not follow — the "some living things are plants" overlap need not include any tigers.)
- Practice: Statements: All tigers are animals. All animals are living things. All living things need oxygen. Conclusion: All tigers need oxygen. Does it follow? (Answer: Follows — an unbroken "All" chain carries transitivity all the way through.)
- Practice: Statements: All doctors are educated. All educated people are respected. Conclusions: I. All doctors are respected. II. Some respected people are doctors. Which conclusion(s) follow? (Answer: Both follow — I by transitivity, II by converting "All doctors are respected" to "Some respected are doctors.")

> **Quick revision:** Treat every statement as 100% true, no matter how odd it sounds ("All cats are dogs" is a valid statement for this question) — judge conclusions purely on logic, not on what you know about the real world; Four statement types matter: "All A are B", "No A are B", "Some A are B", and "Some A are not B"; "Some A are B" can always be flipped to "Some B are A" — this conversion is always valid. But "All A are B" can NOT be flipped to "All B are A" — that is a classic trap. "All A are B" can only be weakened to "Some B are A" (these questions assume A has at least one member); Sketch a quick Venn diagram for each conclusion and check whether it holds in every possible arrangement of the circles, not just the most obvious one. If you can draw even one valid arrangement where the conclusion is false, it does not follow; The "either/or" special case: if two conclusions are exact complements of each other (one says "No X are Y", the other says "Some X are Y" — between them, they cover every possibility, since the X-Y overlap is either zero or not), and NEITHER follows on its own, check whether at least one of them must still be true. If so, the answer is "Either conclusion I or II follows," even though neither follows individually; With three statements chained together, work out what the first two combine to tell you, and only then bring in the third — don't try to combine all three at once. A chain of "All...All..." stays strong all the way through, but a "Some" anywhere in the chain usually breaks it: the "some" overlap isn't guaranteed to land inside the earlier subset relationship

Syllogism: Possibility Cases

A regular Syllogism conclusion has to hold in EVERY valid diagram to follow. A possibility conclusion only needs to hold in AT LEAST ONE valid diagram consistent with the statements — a much lower bar, and a different question entirely. Here's the approach, six fully worked examples covering each pattern, and a few to try yourself. A possibility conclusion ("it is possible that...") is valid if you can draw even ONE diagram consistent with the statements where it holds — it does not need to hold in every diagram, unlike a regular "definitely follows" conclusion. A possibility conclusion is NOT valid only when it's impossible in every single diagram consistent with the statements — meaning the statements actively rule it out, not just fail to guarantee it. Two "Some" statements, or a "Some" combined with another statement, usually leave real freedom in how the circles overlap — this is where both a positive and a negative possibility often turn out valid at once. When one category is fully nested inside another that's fully separate from a third (an "All" chained into a "No"), the nested category and the separate one can never overlap in any diagram — ruling out any possibility conclusion that requires them to. When two categories have NO statement linking them directly or transitively, their relationship is completely unconstrained — in that case, both "some X are Y" and "no X are Y" are typically valid possibilities at once, since nothing in the statements rules either one out.

Examples

- Statements: Some pens are books. Some books are tables. Possibilities: I. It is possible that some pens are tables. II. It is possible that no pens are tables. Solution: The "books that are pens" and the "books that are tables" could be the same books (making some pens tables) or entirely different books (making no pens tables) — both are consistent with the statements. Answer: Both possibilities are valid

- Statements: No pen is a book. All books are tables. Possibilities: I. It is possible that some tables are pens. II. It is possible that all tables are pens. Solution: Tables include all the books, but could also include other members beyond just books — those other members could be pens, so "some tables are pens" is possible. But the book-tables can never be pens (since no pen is a book), so not every table can possibly be a pen — "all tables are pens" is ruled out. Answer: Only possibility I is valid
- Statements: All pens are books. No book is a table. Possibilities: I. It is possible that some pens are tables. II. It is possible that all tables are pens. Solution: Since every pen is a book, and no book is a table, pens and tables can never overlap in any valid diagram — ruling out both "some pens are tables" and the stronger "all tables are pens." Answer: Neither possibility is valid
- Statements: Some pens are books. No book is a table. Possibilities: I. It is possible that all pens are tables. II. It is possible that some pens are tables. Solution: Since books are never tables, any pen that is also a book cannot be a table — and "some pens are books" guarantees at least one such pen, so not every pen can possibly be a table, ruling out "all pens are tables." But pens outside that book-overlap aren't constrained at all — some of them could be tables, making "some pens are tables" possible. Answer: Only possibility II is valid
- Statements: All pens are books. Some books are tables. Possibilities: I. It is possible that all pens are tables. II. It is possible that no pens are tables. Solution: Since pens are a subset of books, and only SOME books are tables, nothing forces any particular pen to be (or not be) among the table-books. If the pen-books happen to be exactly the table-books, all pens could be tables — possible. If the pen-books fall entirely outside the table-books, no pens are tables — also possible. Answer: Both possibilities are valid
- Statements: No pen is a book. No book is a table. Possibilities: I. It is possible that some pens are tables. II. It is possible that no pens are tables. Solution: Both statements only constrain pens and tables relative to books — neither statement says anything about pens and tables directly. With no direct or transitive link between pens and tables, their circles are free to overlap partially, fully, or not at all — both "some pens are tables" and "no pens are tables" are consistent with the given statements. Answer: Both possibilities are valid
- Practice: Statements: Some pens are books. All books are tables. Possibilities: I. It is possible that some pens are tables. II. It is possible that no pens are tables. (Answer: Only possibility I is valid)
- Practice: Statements: No pen is a book. Some books are tables. Possibilities: I. It is possible that some pens are tables. II. It is possible that no pens are tables. (Answer: Both possibilities are valid)
- Practice: Statements: All pens are books. All books are tables. Possibilities: I. It is possible that all pens are tables. II. It is possible that no pens are tables. (Answer: Only possibility I is valid)
- Practice: Statements: All pens are books. All books are tables. Possibilities: I. It is possible that some tables are not pens. II. It is possible that no pens are tables. (Answer: Only possibility I is valid (every pen is forced to be a table by the chain, so II is impossible))
- Practice: Statements: Some pens are books. All books are tables. Possibilities: I. It is possible that some pens are not tables. II. It is possible that all pens are tables. (Answer: Both possibilities are valid)

> **Quick revision:** A possibility conclusion ("it is possible that...") is valid if you can draw even ONE diagram consistent with the statements where it holds — it does not need to hold in every diagram, unlike a regular "definitely follows" conclusion; A possibility conclusion is NOT valid only when it's impossible in every single diagram consistent with the statements — meaning the statements actively rule it out, not just fail to guarantee it; Two "Some" statements, or a "Some" combined with another statement, usually leave real freedom in how the circles overlap — this is where both a positive and a negative possibility often turn out valid at once; When one category is fully nested inside another that's fully separate from a third (an "All" chained into a "No"), the nested category and the separate one can never overlap in any diagram — ruling out any possibility conclusion that requires them to; When two categories have NO statement linking them directly or transitively, their relationship is completely unconstrained — in that case, both "some X are Y" and "no X are Y" are typically valid possibilities at once, since nothing in the statements rules either one out

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Venn Diagram

Venn Diagram: inclusion-exclusion

Venn Diagram questions in the Quant/DI sense are set-counting problems: given how many people/items fall into each of two or three overlapping categories, find how many fall into some combination of them (at least one, only one, exactly two, neither, and so on).

The core tool for two sets is inclusion-exclusion: |A or B| = |A| + |B| – |A and B|. The subtraction corrects for double-counting the people who are in BOTH groups, who would otherwise be counted once in |A| and again in |B|. From this one identity, every other two-set quantity follows: "only A" = |A| – |A and B|; "neither" = Total – |A or B|.

For three sets, inclusion-exclusion extends to: |A or B or C| = |A|+|B|+|C| – |A∩B| – |B∩C| – |A∩C| + |A∩B∩C|. The final "+|A∩B∩C|" term exists because the triple-overlap region gets subtracted THREE times by the pairwise terms (once in each pairwise overlap) but was only ever counted three times by the individual |A|+|B|+|C|, so it needs to be added back once to land on the correct count.

"Only A" (in a three-set problem) means in A but in neither B nor C: |A| – |A∩B| – |A∩C| + |A∩B∩C| (the triple-overlap is added back for the same double-subtraction reason). "Exactly two of the three" means in precisely two groups, which is each pairwise overlap MINUS the triple overlap, summed across all three pairs: (|A∩B|–|A∩B∩C|) + (|B∩C| –|A∩B∩C|) + (|A∩C|–|A∩B∩C|).

A quick sanity check for any answer: no "only" or "neither" count should ever come out negative, and "at least one" should never exceed the stated total population — if either happens, a number in the question was misread or miscombined.

Examples

- 70 people total; 45 like Hindi, 38 like English, 20 like both. At least one = 45+38–20 = 63. Only Hindi = 45–20 = 25. Neither = 70–63 = 7.
- 80 people; 50 like tea, 40 like coffee, 15 like neither. At least one = 80–15 = 65. Both = 50+40–65 = 25 (working backward from "at least one" to find the overlap).
- 100 students; 50 study Physics, 45 Chemistry, 40 Maths; pairwise overlaps 20, 15, 12; all three = 8. At least one = (50+45+40) – (20+15+12) + 8 = 135 – 47 + 8 = 96.
- Using the same data, only Physics = 50 – 20 – 12 + 8 = 26 (subtract both pairwise overlaps involving Physics, then add back the triple-overlap that got subtracted twice).
- Using the same data, exactly two subjects = (20–8) + (15–8) + (12–8) = 12+7+4 = 23 (each pairwise overlap, with the triple-overlap people removed since they're in three groups, not two).
- 500 people; 300 read Hindi papers, 250 read English papers, 100 read both. Neither = 500 – (300+250–100) = 500–450 = 50.
- A sanity check: if a 3-set calculation produces "only A = –10" or "at least one = 150" out of a stated 100 people, a number was misapplied — recheck which overlaps were given as pairwise-only versus including the triple-overlap.
- 60% play Cricket, 50% play Football, 25% play both (percentage version works identically to raw counts). At least one = 60+50–25 = 85%. Neither = 100%–85% = 15%.

> **Quick revision:** Two sets: |A or B| = |A|+|B|–|A∩B|. Three sets: add the triple-overlap back once after subtracting all three pairwise overlaps. "Only A" and "exactly two" both need the triple-overlap removed from the relevant pairwise terms. Sanity check: no negative counts, "at least one" ≤ total.

Venn Diagram Solved Questions

Venn Diagram questions here are about counting overlapping groups correctly — the core idea is "inclusion-exclusion": add the groups, then subtract whatever got counted twice. Here's the concept, six fully worked examples, and a few to try yourself. If some people belong to group A, some to group B, and some to BOTH, the number who belong to A or B is A + B – (both) — not simply A + B, which double-counts the overlap. To find how many belong to EXACTLY one group (not both), subtract the "both" count from each group's total: only A = A – both,

only B = B – both. For three overlapping groups, every pairwise "both" count given usually includes people in all three — the formula is: total in at least one = A + B + C – (A∩B) – (B∩C) – (A∩C) + (A∩B∩C), adding the all-three group back once since it got subtracted three times in the pairwise terms. "Neither" (people in none of the groups) = Total people – (number in at least one group). To find how many belong to EXACTLY TWO of three groups (not all three), subtract three times the triple-overlap from the sum of the pairwise overlaps: exactly-two = (A∩B + B∩C + A∩C) – 3×(A∩B∩C) — each triple-overlap person is counted in all three pairwise terms, so it must come out three times, not once.

Examples

- In a class of 60 students, 35 like Mathematics, 30 like Science, and 15 like both subjects. How many students like at least one of the two subjects? How many like neither? Solution: At least one = Mathematics + Science – Both = 35 + 30 – 15 = 50. Neither = Total – At least one = 60 – 50 = 10. Answer: At least one = 50, Neither = 10
- In a survey of 100 people, 60 read Newspaper A, 40 read Newspaper B, and 25 read both. How many read only Newspaper A? How many read only Newspaper B? Solution: Only A = A – Both = 60 – 25 = 35. Only B = B – Both = 40 – 25 = 15. Answer: Only A = 35, Only B = 15
- In a group of 50 people, 20 speak Hindi, 25 speak English, and 10 speak both languages. How many speak neither Hindi nor English? Solution: At least one = 20 + 25 – 10 = 35. Neither = 50 – 35 = 15. Answer: 15
- In a class of 100 students, 50 play Cricket, 40 play Football, 30 play Hockey. 15 play both Cricket and Football, 12 play both Football and Hockey, 10 play both Cricket and Hockey, and 5 play all three games. How many students play at least one of the three games? Solution: Apply the three-set formula: 50 + 40 + 30 – 15 – 12 – 10 + 5. = 120 – 37 + 5 = 88. Answer: 88
- Using the same class of 100 students (Cricket/Football/Hockey data above), how many play Cricket only (and neither of the other two games)? Solution: Only Cricket = Cricket – (Cricket∩Football) – (Cricket∩Hockey) + (all three). = 50 – 15 – 10 + 5 = 30. Answer: 30
- In a group of 70 students, 40 play Chess, 35 play Carrom, and 10 play neither game. How many play both Chess and Carrom? Solution: At least one = Total – Neither = 70 – 10 = 60. Both = Chess + Carrom – At least one = 40 + 35 – 60 = 15. Answer: 15
- Practice: In a class of 50 students, 28 like Painting, 22 like Dancing, and 10 like both. How many like at least one activity? How many like neither? (Answer: At least one = 40, Neither = 10)
- Practice: In a survey of 80 people, 45 drink Tea, 35 drink Coffee, and 15 drink both. How many drink only Tea? How many drink only Coffee? (Answer: Only Tea = 30, Only Coffee = 20)
- Practice: In a group of 150 people, 70 like Cricket, 60 like Football, 50 like Tennis. 20 like both Cricket and Football, 15 like both Football and Tennis, 18 like both Cricket and Tennis, and 8 like all three sports. How many like at least one of the three sports? (Answer: 135)
- Practice: Using the same 150-person Cricket/Football/Tennis data above, how many like exactly two of the three sports (not all three)? (Answer: 29. (20+15+18) – 3×8 = 53 – 24.)
- Practice: In a group of 60 people, 25 like Tea only, 20 like Coffee only, and 8 like both. How many like neither? (Answer: 7. At least one = 25+20+8 = 53; neither = 60–53.)

Quick revision: If some people belong to group A, some to group B, and some to BOTH, the number who belong to A or B is A + B – (both) — not simply A + B, which double-counts the overlap; To find how many belong to EXACTLY one group (not both), subtract the "both" count from each group's total: only A = A – both, only B = B – both; For three overlapping groups, every pairwise "both" count given usually includes people in all three — the formula is: total in at least one = A + B + C – (A∩B) – (B∩C) – (A∩C) + (A∩B∩C), adding the all-three group back once since it got subtracted three times in the pairwise terms; "Neither" (people in none of the groups) = Total people – (number in at least one group); To find how many belong to EXACTLY TWO of three groups (not all three), subtract three times the triple-overlap from the sum of the pairwise overlaps: exactly-two = (A∩B + B∩C + A∩C) – 3×(A∩B∩C) — each triple-overlap person is counted in all three pairwise terms, so it must come out three times, not once

Set Theory Solved Questions

Most Set Theory questions here reduce to one formula — the union of two groups equals their sizes added together, minus whatever they share — since adding the overlap twice is the error this formula exists to fix. This page covers that two-set formula, its extension to three groups, and the "exactly two" and "none" variants, with several fully worked examples. For two sets: $|A \cup B| = |A| + |B| - |A \cap B|$ — adding the two group sizes directly double-counts whoever is in both, so the overlap is subtracted back out once. "At least one" means the union, $|A \cup B|$. "Neither" means everyone outside the union: Total − $|A \cup B|$. "Only A" (in A but not B) = $|A| - |A \cap B|$. "Exactly one of A or B" = $|A \cup B| - |A \cap B|$ (the union, minus whoever is in both). Draw two overlapping circles and fill in the overlap number first — the "only A" and "only B" regions are then whatever's left in each circle after removing the overlap. For three sets, the formula extends (inclusion-exclusion): $|A \cup B \cup C| = |A|+|B|+|C| - |A \cap B| - |B \cap C| - |A \cap C| + |A \cap B \cap C|$. Each pairwise overlap gets subtracted once, but the people in all three groups get removed three times by those subtractions, so the "all three" count is added back once to correct for that. "Exactly two" of three groups = (sum of the three pairwise intersections) − 3 × (all three) — each pairwise intersection includes the "all three" people, so subtracting 3 times that count removes them from each of the three pairwise totals. For a three-circle Venn diagram, fill in the centre (all three) first, then each pairwise-only region, then each single-group-only region — working from the most overlapped region outward avoids double-counting.

Examples

- In a class of 60 students, 35 play cricket and 25 play football. If 10 students play both, how many play at least one of the two games? Solution: $|\text{Cricket} \cup \text{Football}| = 35 + 25 - 10 = 50$. Answer: 50
- In a survey of 100 people, 60 like tea and 50 like coffee. If 20 like both, how many like neither? Solution: $|\text{Tea} \cup \text{Coffee}| = 60 + 50 - 20 = 90$. Neither = Total − union = 100 − 90 = 10. Answer: 10
- In a group of 50 students, 30 study Math, 25 study Physics, and 15 study both. How many study only Math (not Physics)? Solution: Only Math = $|\text{Math}| - |\text{Math} \cap \text{Physics}| = 30 - 15 = 15$. Answer: 15
- In a class of 80 students, 50 play cricket, 40 play football, and 20 play both. How many play exactly one of the two games? Solution: $|\text{Cricket} \cup \text{Football}| = 50 + 40 - 20 = 70$. Exactly one = union − both = 70 − 20 = 50. Answer: 50
- In a class of 100 students: 50 play cricket, 40 play football, 30 play hockey. 15 play both cricket and football, 12 play both football and hockey, 10 play both cricket and hockey, and 5 play all three. How many play at least one of the three games? Solution: $|C \cup F \cup H| = |C|+|F|+|H| - |C \cap F| - |F \cap H| - |C \cap H| + |C \cap F \cap H| = 50+40+30 - 15-12-10 + 5 = 120 - 37 + 5 = 88$. Answer: 88
- Using the same data as above, how many students play exactly two of the three games? Solution: Exactly two = (sum of pairwise intersections) − 3 × (all three) = (15+12+10) − 3(5) = 37 − 15 = 22. Answer: 22
- Using the same data as above, how many students play none of the three games? Solution: None = Total − (at least one) = 100 − 88 = 12. Answer: 12
- Practice: In a class of 70 students, 40 play chess and 30 play carrom. If 15 play both, how many play at least one game? (Answer: 55)
- Practice: In a survey of 120 people, 70 like movies and 60 like music. If 25 like both, how many like neither? (Answer: 15)
- Practice: In a group of 90 students, 55 study English, 45 study Hindi, and 20 study both. How many study only English? (Answer: 35)
- Practice: In a survey of 80 people: 45 read newspaper A, 35 read B, 30 read C. 15 read both A and B, 12 read both B and C, 10 read both A and C, and 5 read all three. How many read at least one? (Answer: 78. 45+35+30 − 15−12−10 + 5.)
- Practice: Using the same data, how many read exactly two of the three newspapers? (Answer: 22. (15+12+10) − 3(5).)
- Practice: Using the same data, how many read none of the three? (Answer: 2. 80 − 78.)
- Practice: In a class of 55 students, 32 play basketball and 28 play volleyball. If 10 play both, how many play neither? (Answer: 5. Union = 32+28−10 = 50; neither = 55−50.)

Quick revision: For two sets: $|A \cup B| = |A| + |B| - |A \cap B|$ — adding the two group sizes directly double-counts whoever is in both, so the overlap is subtracted back out once; "At least one" means the union, $|A \cup B|$. "Neither" means everyone outside the union: Total − $|A \cup B|$; "Only A" (in A but not B) = $|A| - |A \cap B|$. "Exactly one of A or B" = $|A \cup B| - |A \cap B|$ (the union, minus whoever is in both); Draw two overlapping circles and fill in the overlap number first — the "only A" and "only B" regions are then whatever's left in each circle after removing the overlap; For three sets, the formula extends (inclusion-exclusion): $|A \cup B \cup C| = |A|+|B|+|C| - |A \cap B| - |B \cap C| - |A \cap C| + |A \cap B \cap C|$. Each pairwise overlap gets subtracted once, but the people in all three groups get removed three times by those subtractions, so the "all three" count is added back once to correct for that; "Exactly two" of three groups = (sum of the three pairwise intersections) − 3 × (all three) — each pairwise intersection includes the "all three" people, so subtracting 3 times that count removes them from each of the three pairwise totals; For a three-circle Venn diagram, fill in the centre (all three) first, then each pairwise-only region, then each single-group-only region — working from the most overlapped region outward avoids double-counting

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Calendar

Calendar: counting odd days

A calendar question almost always reduces to one skill: counting "odd days" — the remainder left over after dividing a span of days by 7 — and shifting a known reference day forward (or backward) by that many days.

A normal (non-leap) year has 365 days = 52 complete weeks + 1 extra day, so it contributes exactly 1 odd day. A leap year has 366 days, contributing 2 odd days. A year is a leap year if it's divisible by 4 — except a century year (one ending in 00), which is a leap year only if it's also divisible by 400. That's why 2000 was a leap year but 1900 and 2100 are not, even though both are divisible by 4.

To find the day of the week for a target date given a reference date: count the number of days between them (or, for same-date-different-year questions, just add up the odd days contributed by each year in between — 1 for a normal year, 2 for a leap year, and be careful whether the leap year's 29 February actually falls inside the span you're counting). Take that total modulo 7, and shift the reference weekday forward by that many steps. Going BACKWARD in time works the same way, just subtract instead of add.

A few traps worth knowing by heart: going from 28 February to 1 March crosses a 29 February only in a leap year (2 days instead of 1), so a leap year's extra day only matters if your date range actually contains it. A gap of exactly a multiple of 7 days (like 14 or 21 days) always lands on the SAME weekday, which is a quick sanity check. And for the classic "5 Sundays in a 31-day month" style puzzle: a 31-day month has 4 full weeks plus 3 extra days, which repeat the weekdays of the 1st, 2nd and 3rd of the month — so a weekday appears a 5th time only if it falls among those first three days of the month.

Examples

- 1 January 2024 was a Monday (2024 is a leap year — divisible by 4, not a century year — so it has 366 days, 2 odd days). 1 January 2025 is 2 days later: Wednesday. (Verified: 1 Jan 2025 was in fact a Wednesday.)
- If 1 March 2023 was a Wednesday, 15 March 2023 is 14 days later — exactly 2 weeks, 0 odd days — so it's also a Wednesday.
- 1900 is divisible by 4, but as a century year it also needed to be divisible by 400 — it wasn't (1900/400 = 4.75), so 1900 was NOT a leap year. 2000 IS divisible by 400, so it WAS a leap year.
- 15 August 1947 (Indian Independence Day) was a Friday. 26 January 1950 (the date India's Constitution came into effect) was a Thursday — these are fixed historical facts, useful as reference points for other calendar problems set in that era.
- Today is Wednesday. 50 days from today: 50 ÷ 7 leaves remainder 1, so the answer is Wednesday + 1 day = Thursday.
- A 30-day month starts on a Saturday. The first 28 days contain exactly 4 of every weekday; the 2 extra days (the 29th and 30th) repeat the weekdays of the 1st and 2nd — Saturday and Sunday. So this month has 5 Saturdays and 5 Sundays, but only 4 of every other weekday.

- A man was born on 29 February 2000 (a leap year). His next actual birthday (29 February) isn't the following year — it's the next leap year, 2004, since 29 February only exists in leap years.
- Today is Sunday. What day was it 100 days ago? 100 ÷ 7 leaves remainder 2, so count 2 days BACKWARD from Sunday: Saturday, then Friday — so 100 days ago was a Friday.

> **Quick revision:** Odd days: normal year = 1, leap year = 2. Leap year rule: divisible by 4, but century years (ending 00) need divisibility by 400. Shift the reference weekday forward by (days gap mod 7) for a later date, or backward for an earlier date. A gap that's a multiple of 7 always lands on the same weekday.

Calendar (Day of the Week)

Calendar questions ask you to find the day of the week for a given date — the whole topic rests on counting "odd days" (the remainder left over after dividing the day-gap by 7) and shifting a known reference day forward by that many. This page covers that concept, counting across months (watching for February in a leap year), and multi-year gaps, with several fully worked examples. A normal year has 365 days = 52 weeks + 1 extra day, so it contributes 1 "odd day". A leap year has 366 days, contributing 2 odd days. A year is a leap year if it's divisible by 4 — EXCEPT a century year (ending in 00), which is a leap year only if it's also divisible by 400. (So 2000 was a leap year, but 1900 was not — this century exception is the most commonly tested trap.) To find the day of the week for a target date given a known reference date: count the number of days between them, find the remainder when divided by 7 (the odd days), then shift the reference day forward by that many days. For same-date, different-year questions, you can skip counting individual days — just add up one odd day per normal year and two per leap year between the two dates. When counting the day-gap across multiple months, use each month's ACTUAL length (30, 31, or 28/29 for February) — forgetting that February has 29 days in a leap year is a common source of a one-day error. For a gap spanning several years that aren't a simple "same date" comparison, just add up each year's odd-day contribution one year at a time (1 for a normal year, 2 for a leap year) rather than looking for a shortcut — this always works and avoids relying on a half-remembered rule of thumb.

Examples

- If 1 January 2024 was a Monday, what day of the week was 1 January 2025? Solution: 2024 is a leap year (366 days), so it contributes 2 odd days. Shift Monday forward by 2 days: Monday → Tuesday → Wednesday. Answer: Wednesday
- Today is Wednesday. What day will it be after 15 days? Solution: 15 ÷ 7 leaves a remainder of 1 (15 = 2×7 + 1), so the odd days are 1. Shift Wednesday forward by 1 day: Wednesday → Thursday. Answer: Thursday
- If 1 March 2023 was a Wednesday, what day of the week was 15 March 2023? Solution: The gap is 15 − 1 = 14 days. 14 ÷ 7 leaves a remainder of 0, so there are no odd days — the day of the week repeats exactly. Answer: Wednesday (same as 1 March, since 14 days is exactly 2 weeks)
- Was the year 1900 a leap year? Was the year 2000? Solution: 1900 is divisible by 4, but it's a century year, so it must also be divisible by 400 to qualify — 1900 ÷ 400 is not a whole number, so 1900 was NOT a leap year. 2000 is also a century year, and 2000 ÷ 400 = 5 exactly, so 2000 WAS a leap year. Answer: 1900 was not a leap year; 2000 was a leap year
- If 1 January 2024 is a Monday, what day of the week is 1 April 2024? Solution: 2024 is a leap year, so February has 29 days. Days from 1 January to 1 April = days in January (31) + February (29) + March (31) = 91. 91 ÷ 7 = 13 exactly, remainder 0 — so 1 April falls on the SAME day as 1 January. Answer: Monday (if you'd mistakenly used 28 days for February, you'd get 90 days and wrongly land on Sunday)
- If 1 January 2020 was a Wednesday, what day of the week was 1 January 2023? Solution: Add up the odd-day contribution of each year from 2020 up to (but not including) 2023: 2020 is a leap year (2 odd days), 2021 is normal (1), 2022 is normal (1). Total odd days = 2 + 1 + 1 = 4. Shift Wednesday forward by 4 days: Wed → Thu → Fri → Sat → Sun. Answer: Sunday
- Is the year 2100 a leap year? Solution: 2100 is divisible by 4 (2100 ÷ 4 = 525), but it is a century year, so it must also be divisible by 400. 2100 ÷ 400 = 5.25, not a whole number — so 2100 is NOT a leap year. Answer: No, 2100 is not a leap year
- Practice: If 1 January 2023 was a Sunday, what day of the week was 1 January 2024? (Answer: Monday (2023 is not a leap year, so it contributes only 1 odd day))

- Practice: Today is Saturday. What day was it 23 days ago? (Answer: Thursday (23 ÷ 7 leaves a remainder of 2, so shift Saturday backward by 2 days))
- Practice: If 5 June 2024 was a Wednesday, what day of the week was 19 June 2024? (Answer: Wednesday (the gap is 14 days, exactly 2 weeks, so the day repeats))
- Practice: If 1 January 2024 is a Monday, what day of the week is 1 March 2024? (Answer: Friday. Days = 31 (Jan) + 29 (Feb, leap year) = 60; 60 mod 7 = 4; Monday + 4.)
- Practice: If 1 January 2021 was a Friday, what day of the week was 1 January 2024? (Answer: Monday. 2021, 2022, 2023 are all non-leap (1 odd day each); total 3; Friday + 3.)
- Practice: Is the year 2400 a leap year? (Answer: Yes. 2400 ÷ 4 = 600, and as a century year, 2400 ÷ 400 = 6 exactly.)
- Practice: Today is Tuesday. What day will it be after 50 days? (Answer: Wednesday. 50 ÷ 7 leaves remainder 1.)

> **Quick revision:** A normal year has 365 days = 52 weeks + 1 extra day, so it contributes 1 "odd day". A leap year has 366 days, contributing 2 odd days; A year is a leap year if it's divisible by 4 — EXCEPT a century year (ending in 00), which is a leap year only if it's also divisible by 400. (So 2000 was a leap year, but 1900 was not — this century exception is the most commonly tested trap.); To find the day of the week for a target date given a known reference date: count the number of days between them, find the remainder when divided by 7 (the odd days), then shift the reference day forward by that many days; For same-date, different-year questions, you can skip counting individual days — just add up one odd day per normal year and two per leap year between the two dates; When counting the day-gap across multiple months, use each month's ACTUAL length (30, 31, or 28/29 for February) — forgetting that February has 29 days in a leap year is a common source of a one-day error; For a gap spanning several years that aren't a simple "same date" comparison, just add up each year's odd-day contribution one year at a time (1 for a normal year, 2 for a leap year) rather than looking for a shortcut — this always works and avoids relying on a half-remembered rule of thumb

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Clock

Clock: the angle between the hands

Every clock-hands question comes down to tracking two speeds: the minute hand sweeps the full 360° face in 60 minutes, so it moves 6° per minute. The hour hand sweeps 360° in 12 hours (720 minutes), so it moves only 0.5° per minute — it creeps forward steadily even between the hour marks, which is the detail most people forget.

At H hours and M minutes, the hour hand's position (measured clockwise from 12) is 30H + 0.5M degrees (30° per hour, plus the extra 0.5°/min creep), and the minute hand's position is 6M degrees. The angle between them is the absolute difference of those two, reduced to the smaller of the two possible angles (since the hands split the circle into two arcs that add up to 360°).

Three recurring question types all follow from this one formula: (1) "find the angle at a given time" — just plug in H and M. (2) "when do the hands coincide (0° apart)" — set 30H + 0.5M = 6M and solve for M; the hands coincide 11 times every 12 hours (not 12 — the coincidence at the very start and the very end of the 12-hour block is the same instant). (3) "when are the hands opposite (180° apart)" or "at a right angle (90°)" — same equation, with 180 or 90 added to one side; opposite happens 11 times and a right angle happens 22 times in every 12-hour period (twice as often, since the hands pass through 90° twice for every full relative revolution).

A genuine edge case: between 5 and 6 o'clock, the hands are never exactly opposite anywhere strictly inside that hour — the opposite moment lands exactly on the 6:00 boundary. Always double-check an "opposite between H and H+1" answer actually falls strictly inside that hour, not on its edge.

A separate but common sub-type is the faulty clock: if a clock gains (or loses) a fixed number of minutes every hour, then in T actual minutes it shows T × (60 ± gain)/60 clock-minutes — work out the clock's own elapsed time first, then add it to whatever time it was set to.

Examples

- At 3:00, the hour hand is at 90° (30×3) and the minute hand is at 0°. Angle = 90°.

- At 4:30, the hour hand is at 30×4+0.5×30 = 135°, the minute hand is at 180°. Angle = |135-180| = 45°.
- At 7:20, the hour hand is at 30×7+0.5×20 = 220°, the minute hand is at 120°. Angle = |220-120| = 100°.
- The hands coincide (0° apart) 11 times every 12 hours, so 22 times in a full 24-hour day — not 12 or 24, because the coincidence at the 12-hour boundary is shared between consecutive blocks.
- The hands are at a right angle (90°) 22 times every 12 hours, since they pass through a 90° separation twice for every relative revolution between them — so 44 times in 24 hours.
- Between 4 and 5 o'clock, the hands coincide when 30×4 + 0.5M = 6M, i.e. 120 = 5.5M, giving M = 240/11 = 21 9/11 minutes — so at 4:21 9/11.
- Between 5 and 6 o'clock specifically, solving for the hands being exactly opposite gives M = 60 minutes exactly — which is really 6:00, the boundary of the hour, not a moment strictly inside it. This hour is the one standard exception where no interior "opposite" moment exists.
- A clock that gains 5 minutes every hour is set correctly at 12:00 noon. By actual 4:00 pm (240 actual minutes later), the clock has advanced 240 × (65/60) = 260 of its own minutes = 4h 20m, so it reads 4:20 pm.

> **Quick revision:** Hour hand: 30H + 0.5M degrees. Minute hand: 6M degrees. Angle = |difference|, take the smaller of it and 360 minus it. Hands coincide 11 times, are opposite 11 times, and are at right angles 22 times, every 12 hours. Watch for the 5-6 o'clock boundary case for "opposite."

Clock (Angle Between Hands)

Clock questions are a disguised speed problem — the hour and minute hands move at fixed rates, so finding the angle between them at any given time is just plugging into a formula. This page covers that formula, the "coincide" and "right angle" variants, and mirror-image clock questions, with several fully worked examples. The minute hand completes 360° in 60 minutes, so it moves 6° every minute. The hour hand completes 360° in 12 hours (720 minutes), so it moves 0.5° every minute — it creeps forward steadily, not staying fixed at the hour mark. At M minutes past H o’clock: minute-hand angle (from 12) = 6 × M degrees. Hour-hand angle (from 12) = 30 × H + 0.5 × M degrees. Angle between the hands = the absolute difference between those two angles. If that difference is more than 180°, subtract it from 360° — "the angle between the hands" always means the smaller of the two possible angles. For "when are the hands opposite" (180° apart) or "when do they overlap" (0° apart) questions within a given hour, set up the equation using the formulas above and solve for M directly, rather than trying to picture it. "When do the hands coincide" uses the exact same setup as "opposite," just solving minute-angle = hour-angle (difference of 0) instead of a difference of 180. "When are the hands at right angles" (90° apart) usually has TWO valid moments within most hours — once while the hour hand is still ahead by 90°, and once after the faster minute hand has gained all the way past it to be 90° ahead instead. Check both cases (hour-angle − minute-angle = 90, and minute-angle − hour-angle = 90) if the question doesn't specify which one it wants. Mirror-image clock questions use a fixed rule: if a clock's reflection in a (vertical) mirror shows a certain time, the real time = 11:60 minus the mirror-shown time (11:60 is just a convenient way to write 12:00 that avoids borrowing when subtracting the minutes).

Examples

- Find the angle between the hour and minute hands at 3:00. Solution: Hour-hand angle = 30 × 3 + 0.5 × 0 = 90°. Minute-hand angle = 6 × 0 = 0°. Difference = |90 − 0| = 90°. Answer: 90°
- Find the angle between the hour and minute hands at 4:30. Solution: Hour-hand angle = 30 × 4 + 0.5 × 30 = 120 + 15 = 135°. Minute-hand angle = 6 × 30 = 180°. Difference = |135 − 180| = 45°. Answer: 45°
- Find the angle between the hour and minute hands at 7:20. Solution: Hour-hand angle = 30 × 7 + 0.5 × 20 = 210 + 10 = 220°. Minute-hand angle = 6 × 20 = 120°. Difference = |220 − 120| = 100°. Answer: 100°
- At what time between 9 and 10 o’clock will the hour and minute hands be exactly opposite each other (180° apart)? Solution: Hour-hand angle at M minutes past 9 = 270 + 0.5M. Minute-hand angle = 6M. For the hands to be opposite, the hour hand (still ahead at this point in the hour) must lead the minute hand by 180°: (270 + 0.5M) − 6M = 180 → 270 − 5.5M = 180 → 5.5M = 90 → M = 90/5.5 = 180/11 ≈ 16.36. So the hands are opposite at 9 hours and 180/11 minutes, i.e., 16 4/11 minutes past 9. Answer: 9:16 4/11 (16 4/11 minutes past 9)
- At what time between 4 and 5 o'clock will the hour and minute hands coincide (overlap exactly)? Solution: Hour-hand angle at M minutes past 4 = 120 + 0.5M. Minute-hand angle = 6M. For the hands to coincide, set them equal: 6M = 120

+ 0.5M → 5.5M = 120 → M = 120/5.5 = 240/11 = 21 9/11. Answer: 4:21 9/11 (21 9/11 minutes past 4)

- At what time between 3 and 4 o'clock, after 3:00 itself, will the hands next be at right angles (90° apart)? Solution: At 3:00 exactly, the hands are already 90° apart (hour ahead). As the minute hand gains on the hour hand, this gap shrinks to 0 (coincide) and then grows again with the minute hand now ahead. The NEXT right angle happens when the minute hand is 90° ahead of the hour hand: 6M − (90 + 0.5M) = 90 → 5.5M = 180 → M = 180/5.5 = 360/11 = 32 8/11. Answer: 3:32 8/11 (32 8/11 minutes past 3)
- The reflection of a clock in a mirror shows the time as 4:20. What is the actual time? Solution: Actual time = 11:60 − mirror time. 11:60 − 4:20 = 7:40. Answer: 7:40
- Practice: Find the angle between the hour and minute hands at 6:00. (Answer: 180°)
- Practice: Find the angle between the hour and minute hands at 2:40. (Answer: 160°)
- Practice: At what time between 2 and 3 o’clock will the hour and minute hands be exactly opposite each other (180° apart)? (Answer: 2:43 7/11 (43 7/11 minutes past 2))
- Practice: At what time between 7 and 8 o'clock will the hour and minute hands coincide? (Answer: 7:38 2/11. 6M = 210+0.5M gives M = 420/11.)
- Practice: At what time between 5 and 6 o'clock will the hands FIRST be at right angles after 5:00? (Answer: 5:10 10/11. The hour hand starts 150° ahead; it shrinks to 90° ahead first (the later 90°-ahead-the-other-way case happens afterward, at 5:43 7/11).)
- Practice: The reflection of a clock in a mirror shows the time as 5:40. What is the actual time? (Answer: 6:20. 11:60 − 5:40.)
- Practice: Find the angle between the hour and minute hands at 10:10. (Answer: 115°. Hour = 305°, minute = 60°, difference 245°, which is more than 180° so use 360−245.)

> **Quick revision:** The minute hand completes 360° in 60 minutes, so it moves 6° every minute. The hour hand completes 360° in 12 hours (720 minutes), so it moves 0.5° every minute — it creeps forward steadily, not staying fixed at the hour mark; At M minutes past H o’clock: minute-hand angle (from 12) = 6 × M degrees. Hour-hand angle (from 12) = 30 × H + 0.5 × M degrees; Angle between the hands = the absolute difference between those two angles. If that difference is more than 180°, subtract it from 360° — "the angle between the hands" always means the smaller of the two possible angles; For "when are the hands opposite" (180° apart) or "when do they overlap" (0° apart) questions within a given hour, set up the equation using the formulas above and solve for M directly, rather than trying to picture it; "When do the hands coincide" uses the exact same setup as "opposite," just solving minute-angle = hour-angle (difference of 0) instead of a difference of 180; "When are the hands at right angles" (90° apart) usually has TWO valid moments within most hours — once while the hour hand is still ahead by 90°, and once after the faster minute hand has gained all the way past it to be 90° ahead instead. Check both cases (hour-angle − minute-angle = 90, and minute-angle − hour-angle = 90) if the question doesn't specify which one it wants; Mirror-image clock questions use a fixed rule: if a clock's reflection in a (vertical) mirror shows a certain time, the real time = 11:60 minus the mirror-shown time (11:60 is just a convenient way to write 12:00 that avoids borrowing when subtracting the minutes)

Free practice questions: parikshasaathi.com/q/clock/

Cubes and Dice

Cubes and Dice Solved Questions

Dice questions, cube nets and painted-cube problems need different methods. Learn when opposite faces sum to seven, how to infer an opposite face from views, and how to count painted smaller cubes without double-counting edges and corners. The core rule: on a standard die, numbers on opposite faces always sum to 7 (1↔6, 2↔5, 3↔4). To find a face opposite a given number, subtract it from 7. The six faces of one die always sum to 1+2+3+4+5+6 = 21 — a fast way to find the total of several hidden faces is "21 minus whatever’s visible," instead of adding up each hidden face individually. When two dice are joined face-to-face, the two touching faces are both hidden — find their sum, then subtract it from the combined total (42 for two dice) to get everything visible on the outside. Scope of the seven rule: use it only when a standard die is specified. An arbitrary numbered cube can have a different arrangement; infer its opposites from the views or net instead. A cube has six faces. Each face has four neighbours

and one opposite. Faces seen together at a corner are adjacent, never opposite. If four neighbours of a face are known, the remaining label must be opposite. For a net, fold mentally around a chosen base. Do not assume that squares separated on the flat sheet are opposite after folding. In a strip A–B–C–D with E above B and F below B, opposite pairs are A/C, B/D and E/F. For a cube painted on all six outer faces and cut into $n \times n \times n$ equal cubes ($n \geq 2$): three painted faces = 8 corners; exactly two = $12(n - 2)$; exactly one = $6(n - 2)^2$; none = $(n - 2)^3$. These counts assume every outer face was painted before cutting. For $n = 1$ there is just one cube with six painted faces; do not use the corner formula. For partial painting, count the affected faces and edges separately. Check the count: all categories must add up to n^3. A corner belongs to three faces, so counting each face independently would count it three times.

Examples

- On a standard die, the numbers on opposite faces always add up to 7. If one face shows 2, what number is on the face opposite to it? Solution: $7 - 2 = 5$. Answer: 5
- A standard die shows 1, 3 and 5 on three visible faces meeting at a corner. What is the sum of the numbers on the three hidden faces? Solution: The six faces of a die always total $1+2+3+4+5+6 = 21$. Hidden sum = $21 - (1 + 3 + 5) = 21 - 9 = 12$. Answer: 12
- On a standard die, if the face showing 4 is on top, which number is on the bottom face? Solution: The bottom face is opposite the top face: $7 - 4 = 3$. Answer: 3
- Two standard dice are placed together so that the face showing 6 on one die touches the face showing 6 on the other. What is the sum of all the numbers visible on the outside of this combined block? Solution: Two dice together have a total face-sum of $2 \times 21 = 42$. The two touching (hidden) faces both show 6, so their sum is $6 + 6 = 12$. Visible sum = $42 - 12 = 30$. Answer: 30
- On a cube labelled 1 to 6, one view shows 1, 2, 3 and another shows 1, 4, 5 meeting at corners. What is opposite 1? Solution: The first view makes 2 and 3 neighbours of 1. The second makes 4 and 5 neighbours of 1. All four neighbours are now known. The only remaining label is 6. No standard-die assumption is needed. Answer: 6
- A cube is painted on all outer faces and cut into 64 equal cubes. How many have exactly two painted faces? Solution: $64 = 4^3$, so there are four small cubes along each edge. Exactly two painted faces occur on an edge, excluding its two corner cubes. There are 12 edges, with $4 - 2 = 2$ qualifying cubes each: $12 \times 2 = 24$. Answer: 24
- For the same $4 \times 4 \times 4$ painted cube, count all four categories. Solution: Three painted faces: 8 corner cubes. Exactly two: $12 \times 2 = 24$. Exactly one: $6 \times 2^2 = 24$. Unpainted: $2^3 = 8$. Check: $8 + 24 + 24 + 8 = 64$. Answer: 8 with three, 24 with two, 24 with one, 8 with none
- A net has A, B, C, D in a horizontal strip, with E above B and F below B. Which face is opposite B? Solution: Keep B as the base. A and C fold up as two opposite side faces. E and F fold up as the other two side faces. D is attached beyond C and folds over to close the cube above B. Answer: D
- Practice: On a standard die, if one face shows 6, what number is on the opposite face? (Answer: 1)
- Practice: A standard die shows 2, 4 and 6 on three visible faces at a corner. Find the sum of the three hidden faces. (Answer: 9)
- Practice: Two standard dice are placed together so that the face showing 3 on one die touches the face showing 4 on the other. What is the sum of all the numbers visible on the outside of this combined block? (Answer: 35)
- Practice: A cube painted on all sides is cut into 125 equal cubes. How many have exactly one painted face? (Answer: 54. Since $n = 5$, each outer face has $(5 - 2)^2 = 9$ non-edge cubes; six faces give 54.)
- Practice: For that $5 \times 5 \times 5$ cube, how many small cubes have no paint? (Answer: 27. Remove the outer layer: the inner cube is $3 \times 3 \times 3$.)
- Practice: A painted cube is cut into $2 \times 2 \times 2$ cubes. How many have exactly two painted faces? (Answer: 0. All eight cubes are corners with three painted faces; there are no interior edge cubes.)
- Practice: An arbitrary cube has 2 next to 1, 3, 5 and 6. What is opposite 2? (Answer: 4. It is the remaining label. Using $7 - 2$ would incorrectly give 5, which is known to be adjacent.)

Quick revision: The core rule: on a standard die, numbers on opposite faces always sum to 7 (1↔6, 2↔5, 3↔4); To find a face opposite a given number, subtract it from 7; The six faces of one die always sum to 1+2+3+4+5+6 = 21 — a fast way to find the total of several hidden faces is "21 minus whatever's visible," instead of adding up each hidden face individually; When two dice are joined face-to-face, the two touching faces are both hidden — find their sum, then subtract it from the combined total (42 for two dice) to get everything visible on the outside; Scope of the seven rule: use it only when a standard die is specified. An arbitrary numbered cube can have a different arrangement; infer its opposites from the views or net instead; A cube has six faces. Each face has four neighbours and one opposite. Faces seen together at a corner are adjacent, never opposite. If four neighbours of a face are known, the remaining label must be opposite; For a net, fold mentally around a chosen base. Do not assume that squares separated on the flat sheet are opposite after folding. In a strip A–B–C–D with E above B and F below B, opposite pairs are A/C, B/D and E/F; For a cube painted on all six outer faces and cut into n × n × n equal cubes (n ≥ 2): three painted faces = 8 corners; exactly two = 12(n – 2); exactly one = $6(n – 2)^2$; none = $(n – 2)^3$; These counts assume every outer face was painted before cutting. For n = 1 there is just one cube with six painted faces; do not use the corner formula. For partial painting, count the affected faces and edges separately; Check the count: all categories must add up to n^3. A corner belongs to three faces, so counting each face independently would count it three times

Free practice questions: parikshasaathi.com/q/cubes-and-dice/

Data Sufficiency

Data Sufficiency Solved Questions

Data Sufficiency doesn't ask you to solve the problem — it asks whether the given information is enough to solve it, in principle, without you ever finishing the arithmetic. Here's the approach, six fully worked examples covering all the standard answer patterns, and a few to try yourself. These questions give a question plus two numbered Statements, and ask whether the statements provide ENOUGH information to answer it — you're judging sufficiency, not computing the final answer. Standard answer choices: Statement I alone is sufficient (but not II); Statement II alone is sufficient (but not I); both together are needed (neither alone works); either statement alone is sufficient; or even both together are not sufficient. Evaluate each statement completely independently first, as if the other didn't exist — mixing information from both before checking each one alone is the most common mistake here. "Sufficient" means you could, in principle, pin down a single definite answer — it doesn't mean you have to finish the arithmetic. If a statement sets up a valid equation or relationship with exactly one solution, it's sufficient even without computing the final number. A statement that merely restates general background knowledge, or a special case of information already implied by the question itself, adds nothing new — don't mistake a statement sounding informative for it actually narrowing down the answer.

Examples

- Question: What is the value of x? Statement I: x + 5 = 12. Statement II: x is a positive integer. Solution: Statement I alone: x + 5 = 12 gives exactly one value, x = 7 — sufficient alone. Statement II alone: "a positive integer" allows many values (1, 2, 3, …) — not sufficient alone. Answer: Statement I alone is sufficient, but Statement II alone is not
- Question: Is x an even number? Statement I: x is divisible by 4. Statement II: x is divisible by 6. Solution: Statement I alone: any multiple of 4 is automatically even, so this gives a definite "yes" — sufficient alone. Statement II alone: any multiple of 6 is also automatically even, so this too gives a definite "yes" — sufficient alone. Answer: Either statement alone is sufficient
- Question: What is the area of a rectangular field? Statement I: The length of the field is 20 metres. Statement II: The perimeter of the field is 60 metres. Solution: Statement I alone: only gives length, not width — can't find area — not sufficient. Statement II alone: only gives perimeter, which alone doesn't pin down a unique length and width combination — not sufficient. Both together: 2(20 + width) = 60 gives width = 10, so area = 20 × 10 = 200 — a single definite value — sufficient together. Answer: Both statements together are needed
- Question: What is the value of x? Statement I: x is a prime number less than 10. Statement II: x is an odd number. Solution: Statement I alone: primes less than 10 are 2, 3, 5, 7 — multiple values, not sufficient. Statement II alone: infinitely many odd numbers — not sufficient. Both together: an odd prime less than 10 could be 3, 5, or 7 — still multiple values, not narrowed to one. Answer: Even both statements together are not sufficient

- Question: What is the two-digit number N? Statement I: The sum of the digits of N is 9. Statement II: N is a multiple of 9 and is less than 20. Solution: Statement I alone: many two-digit numbers have a digit sum of 9 (18, 27, 36, … 90) — not sufficient. Statement II alone: two-digit multiples of 9 below 20 — only 18 qualifies (9 itself is single-digit, and 27 already exceeds 20) — exactly one value — sufficient alone. Answer: Statement II alone is sufficient, but Statement I alone is not
- Question: Is x greater than y? Statement I: x = y + 3. Statement II: y is a positive number. Solution: Statement I alone: x = y + 3 means x exceeds y by exactly 3, for ANY value of y — a definite "yes" regardless of what y actually is — sufficient alone. Statement II alone: knowing only that y is positive says nothing about x at all — not sufficient. Answer: Statement I alone is sufficient, but Statement II alone is not
- Practice: Question: How many sons does Mr. Verma have? Statement I: Mr. Verma has exactly 2 children, both of whom are sons. Statement II: Mr. Verma has more than 1 child. (Answer: Statement I alone is sufficient, but Statement II alone is not)
- Practice: Question: What is the value of n? Statement I: n is a multiple of 5. Statement II: n is a two-digit number that is both a multiple of 5 and a perfect square. (Answer: Statement II alone is sufficient, but Statement I alone is not (the only two-digit perfect square that's a multiple of 5 is 25))
- Practice: Question: What is the speed of a train? Statement I: The train covers a certain distance in 4 hours. Statement II: The distance covered by the train is 240 km. (Answer: Both statements together are needed)
- Practice: Question: What is Rahul's age? Statement I: Rahul is 5 years younger than his brother. Statement II: Rahul's brother is 20 years old. (Answer: Both statements together are needed (Rahul = 20 − 5 = 15))
- Practice: Question: Is the number Z divisible by 6? Statement I: Z is divisible by 2. Statement II: Z is divisible by 3. (Answer: Both statements together are needed (divisible by both 2 and 3 guarantees divisible by 6))

> **Quick revision:** These questions give a question plus two numbered Statements, and ask whether the statements provide ENOUGH information to answer it — you're judging sufficiency, not computing the final answer; Standard answer choices: Statement I alone is sufficient (but not II); Statement II alone is sufficient (but not I); both together are needed (neither alone works); either statement alone is sufficient; or even both together are not sufficient; Evaluate each statement completely independently first, as if the other didn't exist — mixing information from both before checking each one alone is the most common mistake here; "Sufficient" means you could, in principle, pin down a single definite answer — it doesn't mean you have to finish the arithmetic. If a statement sets up a valid equation or relationship with exactly one solution, it's sufficient even without computing the final number; A statement that merely restates general background knowledge, or a special case of information already implied by the question itself, adds nothing new — don't mistake a statement sounding informative for it actually narrowing down the answer

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Inequality

Inequality: chains and counterexamples

Inequality (coded inequality) questions give you a chain of order relationships between letters and ask which conclusions are definitely, always true. The logic is close to Syllogism, but with numeric-style ordering instead of set membership.

Some questions use coded symbols (like @, #, $, %) in place of >, <, =, ≥, ≤ — always check the legend given at the start before solving anything; the coded symbol a question uses for ">" in one question may mean something else in the next.

A chain like A > B ≥ C only gives a definite conclusion about the two ENDPOINTS if every link points the SAME direction. A > B ≥ C combines validly to A > C (note: the combined relation is strict ">", because even the weak "≥" link can't undo the strict ">" elsewhere in the chain). But a chain that reverses direction partway, like A > B < C, gives NO definite relationship between A and C at all — B being large or small doesn't pin down how A and C compare.

When a strict relation (>) is proven, the weaker version (≥) automatically follows too, since "greater than" always implies "greater than or equal to." The reverse isn't true: proving only ≥ does NOT let you conclude the strict >, since the two sides might be exactly equal.

To check whether a conclusion "follows," try to find two different valid number assignments that satisfy every statement but give opposite results for that conclusion — if you can, it doesn't follow. If you can even make the two letters exactly equal in some valid assignment, that alone rules out both "strictly greater" and "strictly less" as safe conclusions.

Examples

- A > B, B > C, C > D. The whole chain points the same direction, so A > D and B > D are both forced — combine consistently by skipping through the middle letters.
- P ≥ Q, Q = R, R > S. Substituting Q=R gives P ≥ R > S. Even in the boundary case where P equals R exactly, R > S still forces P > S strictly — so P > S is proven, and the weaker P ≥ S follows automatically from it.
- A > B, C > B, C > D. A and D are only linked through B being smaller than both — that never pins down how A and D compare to each other. Neither "A > D" nor "D > A" is forced.
- X < Y, Y < Z, Z = W: this combines to X < Z (direct chain) and, since Z=W, also X < W.
- If "P @ Q" is defined to mean P > Q and "P % Q" means P = Q, decode the symbols FIRST before applying any chain logic — the same letter-chain rules apply once translated back to >, <, =.
- E ≤ F, F ≤ G: this only proves the weak E ≤ G, not the strict E < G, because E could equal G if E=F=G throughout — a valid case the statements don't rule out.
- To test "does X > Z follow from X > Y, Y > W, W < Z?": try X=10,Y=5,W=1,Z=2 (satisfies all three statements, and gives X>Z) versus X=10,Y=5,W=1,Z=20 (also satisfies all three, but gives X<Z) — two valid assignments give opposite answers, so X > Z does NOT follow.
- A ≥ B, B ≥ C, D < C: decode step by step — A ≥ B ≥ C gives A ≥ C. Since D < C ≤ A, D < A follows (strictly, since the D<C link is already strict) — so "D ≥ A" would be definitely FALSE, not just unproven.

> **Quick revision:** A chain combines validly only if every link points the same direction; a direction reversal breaks the connection between the endpoints. Strict (>) implies weak (≥), never the reverse. To disprove a conclusion, find two valid assignments giving opposite results — or one where the two sides are exactly equal.

Inequality (Coded Inequality)

Coded Inequality questions give you a chain of order relationships between letters and ask which conclusions definitely follow — the logic is close to Syllogism, but with ordering instead of set membership. This page covers that approach, the "either/or" special case for non-strict relationships, and reading a coded symbol legend, with several fully worked examples covering the patterns that trip people up most. Some questions use coded symbols (like @, #, $) in place of >, <, =, ≥, ≤ — always check the legend given at the start of the question before solving anything. A chain like A > B ≥ C only gives a definite conclusion about the endpoints (A and C) if every link points the SAME direction. A > B ≥ C combines to A > C; a chain that reverses direction partway (like A > B < C) gives no definite relationship between A and C at all. When a strict relation (>) is proven between two letters, the non-strict version (≥) is also considered to follow, since "greater than" always implies "greater than or equal to". The reverse isn't true: proving only ≥ does not let you conclude the strict >. When you suspect no definite relationship can be proven, try to find two different valid number assignments that satisfy all the statements but give opposite results for the conclusion — if you can, neither conclusion follows. If you can even make the two letters exactly equal in a valid assignment, that rules out both "greater than" and "less than" as safe conclusions. The "either/or" special case: if the derived relationship between two letters is a non-strict one (A ≥ C, with no way to pin down whether it's strictly > or exactly =), then the pair of conclusions "A > C" and "A = C" together follow as "either I or II" — because ≥ by definition means one of those two must be true, even though neither alone is guaranteed. A chain can mix >, <, ≥, ≤ and = freely — as long as there is at least ONE strict link (> or <) anywhere in an otherwise-consistent-direction chain, the overall endpoint relationship comes out strict too, not just ≥ or ≤.

Examples

- Statements: A > B, B > C, C > D. Conclusions: I. A > D. II. B > D. Which of the conclusions logically follow? Solution: The whole chain points the same direction: A > B > C > D. Combining consistently: A > D (skipping through B and C), and B > D (skipping C). Both are forced by the chain. Answer: Both conclusions follow

- Statements: P ≥ Q, Q = R, R > S. Conclusions: I. P > S. II. P ≥ S. Which of the conclusions follow? Solution: Since Q = R, the chain becomes P ≥ R > S. Even in the boundary case where P equals R exactly, R > S still makes P > S strictly — so P > S is forced in every valid case. Since P > S is proven, the weaker P ≥ S is also always true (> always implies ≥). Both conclusions follow, with I being the exact relationship. Answer: Both conclusions follow
- Statements: X < Y, Y < Z, Z = W. Conclusions: I. X < W. II. X < Z. Which of the conclusions follow? Solution: X < Y < Z combines directly to X < Z — Conclusion II is forced. Since Z = W, substituting gives X < Z = W, so X < W too — Conclusion I is forced as well. Answer: Both conclusions follow
- Statements: A > B, C > B, C > D. Conclusions: I. A > D. II. D > A. Which of the conclusions follow? Solution: A and C both relate to B, but neither relates directly to D through a single consistent chain — A connects to B, and D connects to C, with no link bridging A and D together. Try a valid number assignment: B = 1, C = 10, A = 3, D = 3 satisfies every statement (3 > 1, 10 > 1, 10 > 3) but gives A = D exactly — ruling out both "A > D" and "D > A" as safe conclusions. Answer: Neither conclusion follows
- Statements: A ≥ B, B ≥ C. Conclusions: I. A > C. II. A = C. Which of the conclusions follow? Solution: A ≥ B ≥ C combines to A ≥ C — but this is only guaranteed as a non-strict relationship, since both links could be equalities (A = B = C, giving A = C) or could involve a strict step somewhere (e.g. A=3, B=2, C=1, giving A > C). Since neither "A > C" nor "A = C" is individually guaranteed, but A ≥ C IS guaranteed (and ≥ means one of those two must hold), the answer is "either I or II follows." Answer: Either Conclusion I or Conclusion II follows
- Statements: M ≤ N, N < O, O = P. Conclusions: I. M < P. II. M < O. Which of the conclusions follow? Solution: N < O and O = P combine to N < P. Since M ≤ N, even in the boundary case M = N, the strict N < P still forces M < P. So Conclusion I is forced. Similarly, M ≤ N < O forces M < O by the same logic. Conclusion II is forced too. Answer: Both conclusions follow
- In the statements, '@' means '>', '#' means '=', and '$' means '<'. Statements: A @ B, B # C, C $ D. Conclusions: I. A @ D. II. D @ A. Which of the conclusions follow (stated in plain terms)? Solution: Translating: A > B, B = C, C < D. Combining: A > B = C, and separately C < D — so both A and D are simply "greater than C," with no direct link established between A and D themselves. Try two valid assignments: (B=C=1, A=5, D=10) satisfies everything and gives D > A. But (B=C=1, A=100, D=2) also satisfies everything and gives A > D. Since both outcomes are possible, neither "A > D" nor "D > A" is guaranteed. Answer: Neither conclusion follows
- Practice: Statements: M > N, N ≥ O, O > P. Conclusions: I. M > P. II. N > P. Which of the conclusions follow? (Answer: Both conclusions follow)
- Practice: Statements: P = Q, Q < R, R = S. Conclusions: I. P < S. II. P < R. Which of the conclusions follow? (Answer: Both conclusions follow)
- Practice: Statements: X > Y, Z > Y, Z > W. Conclusions: I. X > W. II. W > X. Which of the conclusions follow? (Answer: Neither conclusion follows (Y is the shared reference point — there is no direct chain between X and W))
- Practice: Statements: P ≥ Q, Q ≥ R. Conclusions: I. P > R. II. P = R. Which of the conclusions follow? (Answer: Either Conclusion I or II follows (P ≥ R is guaranteed, but not which of the two it specifically is).)
- Practice: Statements: J ≤ K, K < L, L = M. Conclusions: I. J < M. II. J < L. Which of the conclusions follow? (Answer: Both conclusions follow (the strict K < L link forces strict results even though J ≤ K is non-strict).)
- Practice: In the statements, '*' means '>', '~' means '=', and '%' means '<'. Statements: A * B, B ~ C, C % D. Conclusions: I. A * D. II. D * A. Which of the conclusions follow (stated in plain terms)? (Answer: Neither conclusion follows — same structure as the "shared reference point" trap, just with coded symbols.)
- Practice: Statements: W ≥ X, X > Y, Y ≥ Z. Conclusions: I. W > Z. II. W ≥ Z. Which of the conclusions follow? (Answer: Both conclusions follow (the strict X > Y link in the middle forces W > Z even with ≥ at both ends).)

Quick revision: Some questions use coded symbols (like @, #, $) in place of >, <, =, ≥, ≤ — always check the legend given at the start of the question before solving anything; A chain like A > B ≥ C only gives a definite conclusion about the endpoints (A and C) if every link points the SAME direction. A > B ≥ C combines to A > C; a chain that reverses direction partway (like A > B < C) gives no definite relationship between A and C at all; When a strict relation (>) is proven between two letters, the non-strict version (≥) is also considered to follow, since "greater than" always implies "greater than or equal to". The reverse isn't true: proving only ≥ does not let you conclude the strict >; When you suspect no definite relationship can be proven, try to find two different valid number assignments that satisfy all the statements but give opposite results for the conclusion — if you can, neither conclusion follows. If you can even make the two letters exactly equal in a valid assignment, that rules out both "greater than" and "less than" as safe conclusions; The "either/or" special case: if the derived relationship between two letters is a non-strict one (A ≥ C, with no way to pin down whether it's strictly > or exactly =), then the pair of conclusions "A > C" and "A = C" together follow as "either I or II" — because ≥ by definition means one of those two must be true, even though neither alone is guaranteed; A chain can mix >, <, ≥, ≤ and = freely — as long as there is at least ONE strict link (> or <) anywhere in an otherwise-consistent-direction chain, the overall endpoint relationship comes out strict too, not just ≥ or ≤

Free practice questions: parikshasaathi.com/q/inequality/

Input-Output

Input-Output Solved Questions

An input-output machine rearranges a line of words and numbers through a fixed set of steps — once you know the rule, every question is just carefully applying it and reading off a position. Here's the approach, six fully worked examples using one shared input, and a few to try yourself. The machine's rule is fixed and usually stated (or shown through a solved example) — your job is to apply it exactly, step by step, not to guess a shortcut. Work one step at a time. Write out the full arrangement after each step before moving to the next — trying to jump straight to the final step in your head is where mistakes creep in. Count positions carefully, left to right, within the group the question asks about (e.g. "3rd number" means 3rd among the numbers only, not 3rd overall). In this lesson's machine: Step I moves all the words to the front, sorted in reverse-alphabetical order, while the numbers keep their original relative order unchanged, following behind. Step II (final) then sorts those numbers into descending order; the words stay exactly as Step I left them. If a question gives a different input but says it uses the "same machine" or "same rule," re-derive the whole arrangement from scratch using the stated rule — don't try to pattern-match against an earlier input's specific answer, since the actual words and numbers will differ.

Examples

- Input: 72 kite 19 drum 55 ant 8 wolf 34 bee. What does Step I look like? Solution: Words in the input: kite, drum, ant, wolf, bee. Sorted reverse-alphabetically: wolf, kite, drum, bee, ant. Numbers keep their original relative order from the input (72, 19, 55, 8, 34) and follow the words. Answer: wolf kite drum bee ant 72 19 55 8 34
- Using the same input (72 kite 19 drum 55 ant 8 wolf 34 bee), what does Step II — the final step — look like? Solution: Step II keeps the words exactly as in Step I (wolf, kite, drum, bee, ant) and sorts the numbers into descending order: 72, 55, 34, 19, 8. Answer: wolf kite drum bee ant 72 55 34 19 8
- Using the same input, in the final step, which number is exactly in the middle (3rd) among the five numbers? Solution: The numbers in the final step, left to right, are 72, 55, 34, 19, 8 — the 3rd one is 34. Answer: 34
- Using the same input, which word is third from the left in Step I? Solution: Step I's word order is wolf, kite, drum, bee, ant — the 3rd word is drum. Answer: drum
- Using the same input, which number is immediately to the right of 55 in the final step? Solution: The final step's number order, left to right, is 72, 55, 34, 19, 8 — immediately to the right of 55 is 34. Answer: 34
- Using the same input, how many words appear before the number 19 in the final step's full arrangement? Solution: The final arrangement is: wolf kite drum bee ant 72 55 34 19 8 — all 5 words come before the entire number block, so all 5 words are before 19. Answer: 5
- Practice: Using the same input (72 kite 19 drum 55 ant 8 wolf 34 bee), how many steps does this machine take to reach its final arrangement? (Answer: 2 steps)

- Practice: Using the same input, in Step I, which word is immediately to the left of "ant"? (Answer: bee)
- Practice: Using the same input, in the final step, what is the 2nd number from the left (within the number group)? (Answer: 55)
- Practice: Using the same input, what is the sum of the first and last numbers in the final step? (Answer: 80 (72 + 8))
- Practice: Using the same input, which step keeps the numbers in their original relative order from the input (rather than sorting them)? (Answer: Step I)

> **Quick revision:** The machine's rule is fixed and usually stated (or shown through a solved example) — your job is to apply it exactly, step by step, not to guess a shortcut; Work one step at a time. Write out the full arrangement after each step before moving to the next — trying to jump straight to the final step in your head is where mistakes creep in; Count positions carefully, left to right, within the group the question asks about (e.g. "3rd number" means 3rd among the numbers only, not 3rd overall); In this lesson's machine: Step I moves all the words to the front, sorted in reverse-alphabetical order, while the numbers keep their original relative order unchanged, following behind. Step II (final) then sorts those numbers into descending order; the words stay exactly as Step I left them; If a question gives a different input but says it uses the "same machine" or "same rule," re-derive the whole arrangement from scratch using the stated rule — don't try to pattern-match against an earlier input's specific answer, since the actual words and numbers will differ

Free practice questions: parikshasaathi.com/q/input-output/

Mathematical Operations

Mathematical Operations Solved Questions

These questions hand you a fake rulebook — "+ means ÷", "− means ×" — and ask you to compute an expression using the swapped meanings. The trick is purely mechanical: substitute carefully, then apply the normal order of operations. Here's the approach, six fully worked examples sharing one symbol key, and a few to try yourself. First, rewrite the whole expression substituting every symbol with its NEW meaning — do this as one clean pass before calculating anything, so you don't re-read the swapped meaning mid-calculation and make an error. Once substituted, solve using the normal order of operations: multiplication and division first (left to right), then addition and subtraction (left to right) — exactly like Simplification/BODMAS. Multiplication and division rank equally with each other, and addition and subtraction rank equally with each other — neither one in a pair automatically goes before the other. Double-check your substitution against the key once more before calculating — mixing up which symbol maps to which is the single most common mistake here, not the arithmetic itself. When a question has several multiplication/division symbols spread through the expression (not just one adjacent pair), resolve ALL of them left to right across the whole expression first, before touching any addition or subtraction — don't stop after the first × or ÷ you see.

Examples

- If '+' means '÷', '−' means '×', '×' means '+', and '÷' means '−', find the value of: 20 + 4 − 3 × 6 ÷ 2 Solution: Substitute: 20 ÷ 4 × 3 + 6 − 2. Division and multiplication first: 20 ÷ 4 = 5, then 5 × 3 = 15. Addition and subtraction: 15 + 6 = 21, then 21 − 2 = 19. Answer: 19
- Using the same key ('+'='÷', '−'='×', '×'='+', '÷'='−'), find the value of: 15 × 5 ÷ 10 − 2 + 4 Solution: Substitute: 15 + 5 − 10 × 2 ÷ 4. Multiplication and division first: 10 × 2 = 20, then 20 ÷ 4 = 5. Addition and subtraction: 15 + 5 = 20, then 20 − 5 = 15. Answer: 15
- Using the same key, find the value of: 12 + 6 − 4 × 3 ÷ 2 Solution: Substitute: 12 ÷ 6 × 4 + 3 − 2. Division and multiplication first: 12 ÷ 6 = 2, then 2 × 4 = 8. Addition and subtraction: 8 + 3 = 11, then 11 − 2 = 9. Answer: 9
- Using the same key, find the value of: 18 − 6 + 4 × 2 ÷ 1 Solution: Substitute: 18 × 6 ÷ 4 + 2 − 1. Multiplication and division first: 18 × 6 = 108, then 108 ÷ 4 = 27. Addition and subtraction: 27 + 2 = 29, then 29 − 1 = 28. Answer: 28
- Using the same key, find the value of: 12 + 4 − 5 × 2 ÷ 1 Solution: Substitute: 12 ÷ 4 × 5 + 2 − 1. Division and multiplication first, left to right: 12 ÷ 4 = 3, then 3 × 5 = 15. Addition and subtraction: 15 + 2 = 17, then 17 − 1 = 16. Answer: 16

- Using the same key, find the value of: 20 – 4 + 8 ÷ 3 × 2 Solution: Substitute: 20 × 4 ÷ 8 – 3 + 2. Multiplication and division first, left to right: 20 × 4 = 80, then 80 ÷ 8 = 10. Addition and subtraction: 10 – 3 = 7, then 7 + 2 = 9. Answer: 9
- Practice: Using the same key ('+'='÷', '–'='×', '×'='+', '÷'='–'), find the value of: 24 + 8 – 2 × 5 ÷ 1 (Answer: 10)
- Practice: Using the same key, find the value of: 16 + 8 × 6 – 2 ÷ 5 (Answer: 9)
- Practice: Using the same key, find the value of: 16 + 4 – 3 × 2 ÷ 1 (Answer: 13)
- Practice: Using the same key, find the value of: 24 + 6 × 2 ÷ 3 – 1 (Answer: 3 (24÷6=4, 3×1=3, so 4+2–3=3))
- Practice: Using the same key, find the value of: 18 – 3 × 4 ÷ 2 + 1 (Answer: 56 (18×3=54, 2÷1=2, so 54+4–2=56))

> **Quick revision:** First, rewrite the whole expression substituting every symbol with its NEW meaning — do this as one clean pass before calculating anything, so you don't re-read the swapped meaning mid-calculation and make an error; Once substituted, solve using the normal order of operations: multiplication and division first (left to right), then addition and subtraction (left to right) — exactly like Simplification/BODMAS; Multiplication and division rank equally with each other, and addition and subtraction rank equally with each other — neither one in a pair automatically goes before the other; Double-check your substitution against the key once more before calculating — mixing up which symbol maps to which is the single most common mistake here, not the arithmetic itself; When a question has several multiplication/division symbols spread through the expression (not just one adjacent pair), resolve ALL of them left to right across the whole expression first, before touching any addition or subtraction — don't stop after the first × or ÷ you see

Free practice questions: parikshasaathi.com/q/mathematical-operations/

Puzzles (Floor, Scheduling, Matrix)

Floor-Based Puzzle Solved Questions

Floor puzzles are Seating Arrangement turned on its side — the same clue-by-clue method works, just vertically instead of left-to-right. Here's the approach, six fully worked examples, and a few to try yourself. People or objects are assigned to floors of a building, numbered from bottom to top (always confirm which direction floor 1 is, since it's occasionally numbered the other way). The same clue types as Seating Arrangement apply: "immediately above/below" is exact; "somewhere above/below" only gives a direction, not an exact gap, unless a count is given ("exactly 2 floors above"). Start with whichever clue fixes an exact floor number first, before clues that only describe relationships between people. A common trap: "more than X floors above" gives a RANGE of possibilities, not a single answer, until another clue narrows it down. After placing everything the clues force directly, whatever floor or person is left has only one place to go. If a puzzle says one floor is left vacant (unoccupied), that floor still counts as a numbered floor in the building — it just has no person assigned to it. Don't renumber the remaining floors to skip it.

Examples

- Five friends A, B, C, D and E live on five different floors of a building, numbered 1 (bottom) to 5 (top). A lives on floor 1. B lives immediately above A. D lives on floor 4. E lives immediately above D. Who lives on floor 3? Solution: A = 1. B = immediately above A = 2. D = 4 (given). E = immediately above D = 5. The only floor left, 3, must be C. Answer: C
- Four people P, Q, R and S live on four different floors, numbered 1 (bottom) to 4 (top). Q lives immediately above P. S lives on the topmost floor. R lives immediately below S. Which floor does P live on? Solution: S = 4 (topmost). R = immediately below S = 3. Only floors 1 and 2 remain for P and Q, with Q immediately above P — so P = 1, Q = 2. Answer: Floor 1
- Five people live on five floors numbered 1 to 5 from the bottom. A lives on floor 2. B lives exactly 2 floors above A. C lives on the floor immediately below B. Which floor does C live on? Solution: A = 2. B = A + 2 = 4 (exactly 2 floors above). C = B – 1 = 3 (immediately below B). Answer: Floor 3
- Four friends W, X, Y and Z live on four floors numbered 1 (bottom) to 4 (top). W lives on a floor higher than X but lower than Y. Z lives on the topmost floor. If X lives on floor 1, on which floor does W live? Solution: Z = 4 (topmost). X = 1 (given). W and Y must take the remaining floors, 2 and 3, with W lower than Y — so W = 2, Y = 3. Answer: Floor 2
- Five people P, Q, R, S and T live on five floors numbered 1 (bottom) to 5 (top). T lives on floor 4. Q lives immediately above T. P lives immediately below T. S lives immediately above R. On which floors do S and R live? Solution: T = 4. Q

= immediately above T = 5. P = immediately below T = 3. Only floors 1 and 2 remain, for R and S, with S immediately above R — so R = 1, S = 2. Answer: R on floor 1, S on floor 2

- Five people A, B, C and D, plus one vacant floor, occupy six floors of a building numbered 1 (bottom) to 6 (top) — one person per floor, except the vacant one. A lives on floor 2. B lives immediately above A. Floor 4 is vacant. C lives immediately above the vacant floor. D lives on the topmost floor. Who lives immediately below D? Solution: A = 2. B = immediately above A = 3. Floor 4 = vacant. C = immediately above the vacant floor = 5. D = 6 (topmost). The floor immediately below D (floor 6) is floor 5, which is C's floor. Answer: C
- Practice: Five people live on five floors numbered 1 to 5 from the bottom. P lives on floor 5. Q lives immediately below P. R lives on floor 1. S lives immediately above R. Which floor does T (the fifth person) live on? (Answer: Floor 3)
- Practice: Four people live on four floors numbered 1 (bottom) to 4 (top). A lives exactly 2 floors above B. B lives on floor 1. Which floor does A live on? (Answer: Floor 3)
- Practice: Five friends live on five floors numbered 1 to 5 from the bottom. M lives on floor 3. N lives immediately above M. O lives immediately below M. Which floors do N and O live on? (Answer: N on floor 4, O on floor 2)
- Practice: Four people occupy four floors numbered 1 (bottom) to 4 (top), one of which is vacant. A lives on floor 1. Floor 3 is vacant. B lives immediately above the vacant floor. Which floor does B live on? (Answer: Floor 4)
- Practice: Five people live on five floors numbered 1 to 5 from the bottom. V lives on floor 3. W lives exactly 2 floors below V. Which floor does W live on? (Answer: Floor 1)

> **Quick revision:** People or objects are assigned to floors of a building, numbered from bottom to top (always confirm which direction floor 1 is, since it's occasionally numbered the other way); The same clue types as Seating Arrangement apply: "immediately above/below" is exact; "somewhere above/below" only gives a direction, not an exact gap, unless a count is given ("exactly 2 floors above"); Start with whichever clue fixes an exact floor number first, before clues that only describe relationships between people; A common trap: "more than X floors above" gives a RANGE of possibilities, not a single answer, until another clue narrows it down. After placing everything the clues force directly, whatever floor or person is left has only one place to go; If a puzzle says one floor is left vacant (unoccupied), that floor still counts as a numbered floor in the building — it just has no person assigned to it. Don't renumber the remaining floors to skip it

Scheduling Puzzle Solved Questions

A scheduling puzzle assigns people to days (or months, or dates) using a handful of relational clues — the method is identical to Seating Arrangement, just on a calendar instead of a row of chairs. Here's the approach, one shared puzzle with six fully worked questions, and a few more to try yourself. Start with the most absolute clue (a fixed day, like "X visited on Friday") and place it first — relative clues are far easier to apply once you have one fixed anchor point. Apply "immediately before/after" clues next, since they fix a relationship between two specific slots rather than leaving multiple possibilities open. When a clue only narrows things down to a couple of options, write both down and keep applying the remaining clues to the SAME diagram — don't restart from scratch each time. Fill in the remaining people/days last, using elimination once enough slots are fixed — the final arrangement should satisfy every clue simultaneously, not just the one you used to place each entry. A negative clue ("X did NOT visit on Tuesday") usually only rules out one option rather than fixing a position by itself — save it for the end, to break a tie between the last two or three possibilities left after the positive clues are applied.

Examples

- Five friends — Aman, Bina, Chetan, Divya and Esha — visited a library on five different days of the same week, Monday to Friday, one person per day. Esha visited on Friday. Chetan visited immediately before Esha. Aman visited immediately before Chetan. Divya visited immediately after Bina. Bina did not visit on Tuesday. Who visited the library on Monday? Solution: Esha = Friday. Chetan (immediately before Esha) = Thursday. Aman (immediately before Chetan) = Wednesday. Remaining days, Monday and Tuesday, go to Bina and Divya. Divya is immediately after Bina — among Monday/Tuesday, that only works as Bina = Monday, Divya = Tuesday. So the full week is: Bina (Mon), Divya (Tue), Aman (Wed), Chetan (Thu), Esha (Fri). Answer: Bina
- Using the same puzzle and clues, who visited the library immediately after Aman? Solution: From the full arrangement — Bina (Mon), Divya (Tue), Aman (Wed), Chetan (Thu), Esha (Fri) — the day immediately after Aman's (Wednesday) is Thursday, which is Chetan. Answer: Chetan

- Using the same puzzle and clues, on which day did Divya visit the library? Solution: From the full arrangement, Divya visited on Tuesday. Answer: Tuesday
- Using the same puzzle and clues, how many people visited the library before Chetan? Solution: Chetan visited on Thursday. Before Thursday come Monday (Bina), Tuesday (Divya), and Wednesday (Aman) — three people. Answer: 3
- Using the same puzzle and clues, how many people visited the library after Divya? Solution: Divya visited on Tuesday. After Tuesday come Wednesday (Aman), Thursday (Chetan), and Friday (Esha) — three people. Answer: 3
- Using the same puzzle and clues, who visited the library exactly two days after Bina? Solution: Bina visited on Monday. Two days after Monday is Wednesday, which is Aman's day. Answer: Aman
- Practice: Using the same puzzle and clues, who visited the library last (on the final day among these five)? (Answer: Esha)
- Practice: Using the same puzzle and clues, on which day did Aman visit the library? (Answer: Wednesday)
- Practice: Using the same puzzle and clues, who visited the library immediately before Esha? (Answer: Chetan)
- Practice: Using the same puzzle and clues, on which day did Esha visit the library? (Answer: Friday)
- Practice: Using the same puzzle and clues, who visited the library immediately before Aman? (Answer: Divya)

> **Quick revision:** Start with the most absolute clue (a fixed day, like "X visited on Friday") and place it first — relative clues are far easier to apply once you have one fixed anchor point; Apply "immediately before/after" clues next, since they fix a relationship between two specific slots rather than leaving multiple possibilities open; When a clue only narrows things down to a couple of options, write both down and keep applying the remaining clues to the SAME diagram — don't restart from scratch each time; Fill in the remaining people/days last, using elimination once enough slots are fixed — the final arrangement should satisfy every clue simultaneously, not just the one you used to place each entry; A negative clue ("X did NOT visit on Tuesday") usually only rules out one option rather than fixing a position by itself — save it for the end, to break a tie between the last two or three possibilities left after the positive clues are applied

Comparison Puzzle Solved Questions

These puzzles give relative comparisons (taller than, shorter than, heavier than) instead of exact positions — the method is to convert every clue into one ordered chain, from the most extreme to the least. Here's the approach, one shared puzzle with six fully worked questions, and a few more to try yourself. Convert every comparison clue into a "greater than" chain using one consistent symbol as you read: "X is taller than Y" becomes X > Y. Combine chains that share a common person: if you know C > A and A > B, you can merge them into C > A > B without needing a separate clue connecting C and B directly. A clue giving an extreme ("D is the tallest") anchors one end of the whole chain — place it first, the same way an exact position anchors a Seating Arrangement. Once every person appears in one single merged chain, answering "who is taller than X" or "how many people are shorter than Y" is just reading positions off that chain. If two comparison chains don't share any common person, they can't be merged into one ordering — in that case, a question comparing someone from one chain to someone in the other genuinely "cannot be determined" unless another clue links them.

Examples

- Five friends — A, B, C, D and E — have different heights. A is taller than B. C is taller than A. D is taller than C. E is shorter than B. Who is the tallest among the five? Solution: Convert each clue into a chain: D > C (D taller than C), C > A (C taller than A), A > B (A taller than B), B > E (E shorter than B). Merging all of these into one chain: D > C > A > B > E. Answer: D
- Using the same puzzle and clues, who is the shortest among the five? Solution: From the full chain D > C > A > B > E, the last (shortest) person is E. Answer: E
- Using the same puzzle and clues, how many people are taller than B? Solution: From the chain D > C > A > B > E, the people before B are D, C and A — three people. Answer: 3
- Using the same puzzle and clues, who is taller than A but shorter than D? Solution: From the chain D > C > A > B > E, the person directly between D and A is C. Answer: C
- Using the same puzzle and clues, how many people are shorter than C? Solution: From the chain D > C > A > B > E, the people after C are A, B and E — three people. Answer: 3

- Using the same puzzle and clues, a sixth friend F is said to be taller than D. Where does F fit in the chain, and who is now the tallest? Solution: F > D slots F in at the very top of the existing chain: F > D > C > A > B > E. Answer: F is the tallest, placed above D
- Practice: Using the same puzzle and clues, who is the second tallest among the five? (Answer: C)
- Practice: Using the same puzzle and clues, how many people are shorter than C? (Answer: 3)
- Practice: Using the same puzzle and clues, who is immediately shorter than A? (Answer: B)
- Practice: Using the same puzzle and clues, who is the third tallest among the five? (Answer: A)
- Practice: Using the same puzzle and clues, how many people are taller than E? (Answer: 4 (all of D, C, A and B))

> **Quick revision:** Convert every comparison clue into a "greater than" chain using one consistent symbol as you read: "X is taller than Y" becomes X > Y; Combine chains that share a common person: if you know C > A and A > B, you can merge them into C > A > B without needing a separate clue connecting C and B directly; A clue giving an extreme ("D is the tallest") anchors one end of the whole chain — place it first, the same way an exact position anchors a Seating Arrangement; Once every person appears in one single merged chain, answering "who is taller than X" or "how many people are shorter than Y" is just reading positions off that chain; If two comparison chains don't share any common person, they can't be merged into one ordering — in that case, a question comparing someone from one chain to someone in the other genuinely "cannot be determined" unless another clue links them

Scheduling Puzzle: Month & Date

This is the Scheduling Puzzle method with a second attribute added — each person now has both a month AND a date to pin down, so every clue needs to be sorted into which attribute it actually fixes. Here's the approach, one shared puzzle with six fully worked questions, and a few more to try yourself. Keep two separate tracks — one for months, one for dates — and sort each clue into the track it actually constrains before trying to place anyone. Resolve the month track first if enough direct clues exist to fully fix it — a completely solved month track often turns an indirect date clue ("the person in January...") into a direct one instantly. A clue like "the person born in March" only becomes usable once you know who that is — revisit indirect clues after finishing the track they depend on, rather than trying to use them immediately. Fill in whatever is forced directly first in both tracks; the single remaining option in each track is then fixed by elimination, exactly as in a one-attribute Scheduling Puzzle. Once both tracks are solved, questions can mix the two attributes freely ("who is immediately after X by month" or "how many people come before Y by date") — answer these by reading positions off whichever single track the question actually asks about.

Examples

- Five people — A, B, C, D and E — visit a doctor in five different months (January, March, May, July, September) on five different dates (5th, 10th, 15th, 20th, 25th), one person per month and one per date. A visits in May. C visits in the month immediately after A. E visits in September. B visits in January. E visits on the 5th. A visits on the 10th. The person who visits in January visits on the 20th. The person who visits in March visits on the 15th. Who visits in January? Solution: Months: A = May. C is immediately after May, so C = July. E = September. B = January (given directly). The only month left, March, goes to D. Dates: E = 5th, A = 10th (given directly). The January person (B) visits on the 20th, so B = 20th. The March person (D) visits on the 15th, so D = 15th. The only date left, 25th, goes to C. Full arrangement — A: May/10th, B: January/20th, C: July/25th, D: March/15th, E: September/5th. Answer: B
- Using the same puzzle and clues, on which date does A visit? Solution: From the full arrangement, A visits on the 10th. Answer: 10th
- Using the same puzzle and clues, on which date does C visit? Solution: From the full arrangement, C visits on the 25th. Answer: 25th
- Using the same puzzle and clues, who visits in March? Solution: From the full arrangement, D visits in March. Answer: D
- Using the same puzzle and clues, who visits immediately after A, in month order? Solution: The month order is January, March, May, July, September. A visits in May; the month immediately after May is July, which is C. Answer: C
- Using the same puzzle and clues, how many people visit before D, in month order? Solution: The month order with people is: January (B), March (D), May (A), July (C), September (E). Only one person, B, visits before D. Answer: 1
- Practice: Using the same puzzle and clues, who visits in September? (Answer: E)

- Practice: Using the same puzzle and clues, on which date does E visit? (Answer: 5th)
- Practice: Using the same puzzle and clues, which month does the person who visits on the 20th visit in? (Answer: January)
- Practice: Using the same puzzle and clues, on which date does D visit? (Answer: 15th)
- Practice: Using the same puzzle and clues, who visits immediately before E, in month order? (Answer: C)

> **Quick revision:** Keep two separate tracks — one for months, one for dates — and sort each clue into the track it actually constrains before trying to place anyone; Resolve the month track first if enough direct clues exist to fully fix it — a completely solved month track often turns an indirect date clue ("the person in January...") into a direct one instantly; A clue like "the person born in March" only becomes usable once you know who that is — revisit indirect clues after finishing the track they depend on, rather than trying to use them immediately; Fill in whatever is forced directly first in both tracks; the single remaining option in each track is then fixed by elimination, exactly as in a one-attribute Scheduling Puzzle; Once both tracks are solved, questions can mix the two attributes freely ("who is immediately after X by month" or "how many people come before Y by date") — answer these by reading positions off whichever single track the question actually asks about

Matrix Puzzle Solved Questions

A matrix puzzle links two (or more) separate attributes to the same group of people — here, each person's city AND profession — so every clue narrows down one grid while the other stays open, and the two grids only lock together once enough clues combine. Here's the approach, one shared puzzle with six fully worked questions, and a few more to try yourself. Draw two grids (or one combined table): people down the side, cities across the top, professions across the top again — mark a clue with a tick (confirmed) or a cross (ruled out) in the matching cell as soon as you read it. A clue naming a person directly ("X lives in Delhi") fills a cell immediately. A clue linking two attributes ("the Doctor lives in Delhi") only fills a cell once you also know which person holds one of those two attributes. Work the direct clues first, then use elimination — once a person has one city ruled out, then another, then another, the last city left is confirmed, even without a clue stating it directly. Finish every grid with a count: four people, four cities, four professions — each used exactly once. If a city or profession is left unassigned at the end, a clue was misread. Treat both grids as connected, not separate puzzles — fixing one person's city often rules out an option in the profession grid for a different person (via a clue linking the two), so re-scan both grids after every new fact rather than solving one grid fully before touching the other.

Examples

- Four people — P, Q, R and S — each live in a different city (Delhi, Mumbai, Pune or Jaipur) and have a different profession (Doctor, Engineer, Teacher or Banker). The Doctor lives in Delhi. Q is the Engineer. R lives in Pune. S is not the Doctor and does not live in Delhi or Mumbai. The Teacher does not live in Jaipur. Who is the Doctor, and which city do they live in? Solution: Q is the Engineer (given directly), and R lives in Pune (given directly) — so R is not the Doctor, since the Doctor lives in Delhi. S is not the Doctor (given directly). That leaves only P who can be the Doctor. Since the Doctor lives in Delhi and P is the Doctor, P lives in Delhi. Answer: P, Delhi
- Using the same puzzle, which city does S live in? Solution: The four cities are Delhi, Mumbai, Pune and Jaipur. Delhi is P's and Pune is R's. S does not live in Delhi or Mumbai, so of the two cities left for Q and S (Mumbai and Jaipur), S must take Jaipur. That leaves Mumbai for Q. Answer: Jaipur
- Using the same puzzle, what is R's profession? Solution: The four professions are Doctor, Engineer, Teacher and Banker. P is the Doctor and Q is the Engineer, leaving Teacher and Banker for R and S. The Teacher does not live in Jaipur, and S lives in Jaipur — so S cannot be the Teacher, which makes S the Banker. That leaves Teacher for R. Answer: Teacher
- Using the same puzzle, which profession is paired with Mumbai? Solution: Mumbai belongs to Q. Q is the Engineer. Answer: Engineer
- Using the same puzzle, which profession is paired with Jaipur? Solution: Jaipur belongs to S. S is the Banker. Answer: Banker
- Using the same puzzle, how many people live in a city other than Delhi or Pune? Solution: Delhi is P's city and Pune is R's. The remaining cities, Mumbai and Jaipur, belong to Q and S — two people. Answer: 2

- Practice: Using the same puzzle, what is P's profession? (Answer: Doctor)
- Practice: Using the same puzzle, who is the Banker? (Answer: S)
- Practice: Using the same puzzle, which city is paired with the Teacher? (Answer: Pune)
- Practice: Using the same puzzle, which city is paired with the Engineer? (Answer: Mumbai)
- Practice: Using the same puzzle, who lives in Jaipur? (Answer: S)

> **Quick revision:** Draw two grids (or one combined table): people down the side, cities across the top, professions across the top again — mark a clue with a tick (confirmed) or a cross (ruled out) in the matching cell as soon as you read it; A clue naming a person directly ("X lives in Delhi") fills a cell immediately. A clue linking two attributes ("the Doctor lives in Delhi") only fills a cell once you also know which person holds one of those two attributes; Work the direct clues first, then use elimination — once a person has one city ruled out, then another, then another, the last city left is confirmed, even without a clue stating it directly; Finish every grid with a count: four people, four cities, four professions — each used exactly once. If a city or profession is left unassigned at the end, a clue was misread; Treat both grids as connected, not separate puzzles — fixing one person's city often rules out an option in the profession grid for a different person (via a clue linking the two), so re-scan both grids after every new fact rather than solving one grid fully before touching the other

Floor and Flat Puzzle Solved Questions

This is Floor-Based Puzzle with a second dimension added — each floor has more than one flat side by side, so a person isn't placed by floor alone, but by floor AND flat together. Here's the approach, one shared puzzle with six fully worked questions, and a few more to try yourself. Draw a grid: floors going up one axis, flats (Left/Right, or however many are given) going across the other — every person needs exactly one floor-and-flat cell, and every cell needs exactly one person. "Directly above/below" usually means the SAME flat position, one floor up or down — not just anywhere on the floor above. Check the question's own wording if it says otherwise. Work the clues that fix both floor AND flat first (the most restrictive). A clue that only rules something out ("not on floor 2 or 3") becomes useful once it leaves just one open cell. An edge case is often the key: if someone must be "directly above" another person who could be on the top floor, that's impossible — there's nothing above the top floor — so that placement gets ruled out immediately. A clue saying two people live "on the same floor" fixes only the floor they share, not which flat each takes — don't assume they're also on the same side unless the clue explicitly says so.

Examples

- Six friends — A, B, C, D, E and F — live in a 3-floor building (floor 1 at the bottom, floor 3 at the top), with two flats on each floor: Left and Right. A lives on floor 1, in the Left flat. D lives on floor 2, in the Right flat. E lives directly above C (same side, one floor up). F lives in a Right flat. B does not live on floor 2 or floor 3. C does not live in a Right flat. Which flat does C live in? Solution: A is on floor 1, Left (given). B does not live on floor 2 or 3, and floor 1's Left flat is already A's — so B must take floor 1, Right, the only cell left on floor 1. D is on floor 2, Right (given). C does not live in a Right flat, so C must be in a Left flat — on floor 2 or floor 3 (floor 1 is already full). E lives directly above C. Floor 3 is the top floor, so if C were on floor 3, there would be no floor above for E — impossible. So C must be on floor 2, Left. Answer: Floor 2, Left
- Using the same arrangement, which floor and flat does E live in? Solution: Since C is on floor 2, Left, and E lives directly above (same side, one floor up), E is on floor 3, Left. Answer: Floor 3, Left
- Using the same arrangement, which flat does F live in? Solution: Every other person is now placed — A, B, C, D and E fill five of the six cells, leaving only floor 3, Right for F, which matches the given clue that F lives in a Right flat. Answer: Floor 3, Right
- Using the same arrangement, who lives directly below F? Solution: F is on floor 3, Right. The cell directly below it, floor 2, Right, belongs to D. Answer: D
- Using the same arrangement, how many people live on floor 2? Solution: Floor 2 holds D (Right) and C (Left) — two people. Answer: 2
- Using the same arrangement, who lives in the Left flat on floor 3? Solution: Floor 3 holds E (Left) and F (Right) — the Left flat belongs to E. Answer: E
- Practice: Using the same arrangement, who else lives on floor 1 (with A)? (Answer: B)

- Practice: Using the same arrangement, which floor and flat does B live in? (Answer: Floor 1, Right)
- Practice: Using the same arrangement, who lives directly above A? (Answer: C)
- Practice: Using the same arrangement, which floor and flat does D live in? (Answer: Floor 2, Right)
- Practice: Using the same arrangement, who lives directly above B? (Answer: D)

> **Quick revision:** Draw a grid: floors going up one axis, flats (Left/Right, or however many are given) going across the other — every person needs exactly one floor-and-flat cell, and every cell needs exactly one person; "Directly above/below" usually means the SAME flat position, one floor up or down — not just anywhere on the floor above. Check the question's own wording if it says otherwise; Work the clues that fix both floor AND flat first (the most restrictive). A clue that only rules something out ("not on floor 2 or 3") becomes useful once it leaves just one open cell; An edge case is often the key: if someone must be "directly above" another person who could be on the top floor, that's impossible — there's nothing above the top floor — so that placement gets ruled out immediately; A clue saying two people live "on the same floor" fixes only the floor they share, not which flat each takes — don't assume they're also on the same side unless the clue explicitly says so

Ranking and Order

Ranking and Order Solved Questions

Ranking questions all hang off one small formula connecting rank from the top, rank from the bottom, and the total count — once that's automatic, these become quick points. Here's the concept, six fully worked examples, and a few to try yourself. The key formula: if a person's rank from the top is T and their rank from the bottom is B, in a group of N people total, then T + B = N + 1. Given any two of T, B, N, this gives you the third. "Rank from the top" and "rank from the start" usually mean the same thing — but check the wording carefully, since "top" can mean different things depending on whether the ranking is by marks, height, or finishing order. For relative-position clues ("A is 3 ranks above B", "there are 5 people between X and Y"), convert each clue into a number line of positions, the same way as Seating Arrangement, and resolve step by step. "Above" in rank means a BETTER (smaller/earlier) position number — being 5 ranks above someone ranked 20th means being ranked 15th, not 25th. A common mistake with "people between" clues: if there are exactly K people between X and Y, their position numbers differ by K + 1, not K — the gap counts the people in between, not the distance between the two positions themselves.

Examples

- In a class, Rohan ranks 12th from the top and 18th from the bottom. How many students are there in the class? Solution: Using T + B = N + 1: 12 + 18 = N + 1. N = 12 + 18 − 1 = 29. Answer: 29 students
- In a row of students, Priya is 8th from the left and 15th from the right. How many students are in the row? Solution: Using the same formula: N = 8 + 15 − 1 = 22. Answer: 22 students
- In a class of 40 students, Arjun ranks 15th from the top. What is his rank from the bottom? Solution: Rearranging T + B = N + 1 to solve for B: B = N − T + 1. B = 40 − 15 + 1 = 26. Answer: 26th from the bottom
- A is 5 ranks above B in a class of 35 students, and B's rank from the bottom is 20th. Find A's rank from the top. Solution: First find B's rank from the top: B = N − (rank from bottom) + 1 = 35 − 20 + 1 = 16th. A is 5 ranks above B, meaning A's rank number is 5 less (a better position): 16 − 5 = 11. Answer: 11th from the top
- In a row, there are 6 people between Aditi and Rahul. Aditi is 4th from the left, and Rahul is to the right of Aditi. Find Rahul's position from the left. Solution: 6 people between them means their positions differ by 6 + 1 = 7. Rahul, being to the right, is at a higher position number: 4 + 7 = 11. Answer: 11th from the left
- In a class of 45 students, Kiran ranks 10th from the bottom. What is his rank from the top? Solution: Rearranging T + B = N + 1 to solve for T: T = N − B + 1. T = 45 − 10 + 1 = 36. Answer: 36th from the top
- Practice: In a class, Simran ranks 9th from the top and 23rd from the bottom. How many students are in the class? (Answer: 31 students)
- Practice: In a row of 50 people, Karan is 19th from the left. What is his position from the right? (Answer: 32nd from the right)
- Practice: In a queue, Meena is 7 positions ahead of Suresh. If Suresh is 25th from the front, find Meena's position from the front. (Answer: 18th from the front)

- Practice: In a row, 8 people are seated between Rina and Tina. Rina is 5th from the left and Tina is to the right of Rina. Find Tina's position from the left. (Answer: 14th from the left (5 + 8 + 1 = 14))
- Practice: In a class of 55 students, Vikram ranks 22nd from the top. Find his rank from the bottom. (Answer: 34th from the bottom (55 – 22 + 1 = 34))

> **Quick revision:** The key formula: if a person's rank from the top is T and their rank from the bottom is B, in a group of N people total, then T + B = N + 1. Given any two of T, B, N, this gives you the third; "Rank from the top" and "rank from the start" usually mean the same thing — but check the wording carefully, since "top" can mean different things depending on whether the ranking is by marks, height, or finishing order; For relative-position clues ("A is 3 ranks above B", "there are 5 people between X and Y"), convert each clue into a number line of positions, the same way as Seating Arrangement, and resolve step by step; "Above" in rank means a BETTER (smaller/earlier) position number — being 5 ranks above someone ranked 20th means being ranked 15th, not 25th; A common mistake with "people between" clues: if there are exactly K people between X and Y, their position numbers differ by K + 1, not K — the gap counts the people in between, not the distance between the two positions themselves

Free practice questions: parikshasaathi.com/q/ranking-and-order/

Seating Arrangement

Seating Arrangement: filling the row

Seating Arrangement rewards working methodically far more than being clever. Sketch a row of blank slots (or a circle, for the circular variant), fill in whatever the clues force DIRECTLY and immediately, and use elimination for whatever's left.

Clue strength varies a lot, so work the strongest ones first: an absolute clue ("sits at the extreme left end", "sits third from the left") fixes an exact seat immediately. "Immediately to the right/left of X" is exact once X's seat is known. "X sits between Y and Z" means X is adjacent to BOTH — but check whether another clue tells you the order (Y-X-Z or Z-X-Y), since "between" alone doesn't say which side is which. "Exactly N people sit between X and Y" fixes the GAP but not which one is on the left.

Facing direction is a frequent trap: unless stated otherwise, assume everyone faces North, where a person's own left/right matches how the row looks on paper (left-to-right as written = their own left-to-right). If everyone faces SOUTH instead, every person's own left and right are the MIRROR of the diagram — their own right points toward what looks like the LEFT on paper. In "mixed direction" puzzles, only SOME people face South; apply the flip only to clues phrased from THAT person's own perspective, never to absolute clues like "extreme left end," which always describe the physical row regardless of facing.

Circular arrangements work the same way with one twist: there's no "extreme end," so every clue is relative to another person. When everyone faces the CENTER, a person's own right runs COUNTER-clockwise as you'd draw the table from above (the reverse of the usual map intuition) — because they're facing inward, not outward. "Opposite" only has one unambiguous seat when the total number of people is even.

Always finish with a count: every seat should end up with exactly one person. If a seat is unfilled or two clues conflict, a clue was misread or over-applied.

Examples

- Five friends A, B, C, D, E sit in a row, all facing North. A is at the extreme left end. B is immediately right of A. D is immediately right of C. E is between B and C. Working left to right: A, B, E, C, D — D is at the extreme right end.
- Everyone faces South. B is immediately to the right of A (as physically drawn — diagrams describe the row, not anyone's own perspective, unless a clue explicitly says "from X's own perspective").
- Six people sit around a circular table, facing the center. Fixing one person's seat as a reference (rotation doesn't matter), place the rest using only relative clues — "immediately right/left of X" or "opposite X" — since there's no "end" to anchor to directly.
- Facing the center, a person's own right runs counter-clockwise as drawn from above — the opposite of what a flat map suggests, because they're looking inward, not outward.

- In a mixed-direction row, A faces South while everyone else faces North. A clue like "the person to A's own right" must be read as physically to A's LEFT on the diagram — but "the person at the extreme left end" still means the actual leftmost seat, regardless of who's sitting there or which way they face.
- Exactly two people sit between P and Q. This fixes the GAP (positions differing by 3, counting both ends) but not which of P or Q is on the left — that needs a separate clue, like one of them being at a named end.
- X sits between Y and Z. This means X is adjacent to both — the order could be Y, X, Z or Z, X, Y left to right; a further clue (like Y being closer to a fixed end) is needed to pick one.
- After placing every person the clues fix directly, exactly one seat and one person should be left over — that pairing is forced by elimination, with no clue needed to state it outright.

> **Quick revision:** Fix absolute clues first, then relative ones. Default facing is North (left/right matches the diagram); South flips a person's own left/right; apply that flip only to perspective clues, never to "extreme end" clues. Circular: facing center, own-right = counter-clockwise as drawn.

Seating Arrangement Solved Questions

Seating Arrangement questions reward working methodically more than being clever — sketch a row of blank slots, fill in whatever the clues force directly, then use elimination for the rest. This page covers that approach, the left-from/right-from counting formula, and handling negative clues ("does not sit at either end"), with several fully worked examples. Start with whichever clue is most restrictive — one that fixes an exact position, like "sits at the extreme left end" — before clues that only describe relationships between people. "Immediately to the right/left of X" is exact (one specific seat, one specific side). "Between X and Y" means adjacent to both — but check whether another clue is needed to tell you the order (X then Y, or Y then X). Unless stated otherwise, assume everyone faces North. If a question says everyone faces South, each person’s own right and left are reversed relative to how the row is drawn left-to-right — this reversal is the single most common trap in this topic. After placing everything the clues force directly, whatever position or person is left over has only one place left to go — fill that in last, by elimination. If someone is given as "nth from the left end" AND "mth from the right end" of the same row, the total number of people in the row = n + m − 1 (the two counts both include that one person, so adding them double-counts them once). Negative clues ("X does not sit at either end," "X is not adjacent to Y") don't fix a position by themselves — use them only to rule out specific slots once the positive clues have already narrowed things down to a couple of possibilities.

Examples

- Five friends A, B, C, D and E are sitting in a row, all facing North. A is at the extreme left end. B is sitting to the immediate right of A. D is sitting to the immediate right of C. E is sitting between B and C. Who is sitting at the extreme right end? Solution: A is at position 1 (given). B is immediately right of A, so B is at position 2. E is between B and C, so E must be adjacent to B (position 2) — the only such open position is 3. So E is at position 3. D is immediately right of C, and the only two positions left are 4 and 5, so C is at 4 and D is at 5. Final order: A(1), B(2), E(3), C(4), D(5) — the extreme right end is D. Answer: D
- Five students P, Q, R, S and T are sitting in a row. T is at the extreme right end. Q is sitting third to the left of T. P is sitting immediately to the right of Q. S is sitting immediately to the right of P. Who is sitting at the extreme left end? Solution: T is at position 5 (given). Q is third to the left of T, so Q is at position 5 − 3 = 2. P is immediately right of Q, so P is at position 3. S is immediately right of P, so S is at position 4. Only position 1 is left, so R must be there. Final order: R(1), Q(2), P(3), S(4), T(5) — the extreme left end is R. Answer: R
- Five friends A, B, C, D and E are sitting in a row, all facing South. B is sitting to the immediate right of A. C is sitting to the immediate right of B. D is sitting to the immediate right of C. E is sitting to the immediate right of D. Arranged left to right as drawn in a diagram, who is at the extreme left end? Solution: Since everyone faces South, each person’s own "right" points toward the diagram’s LEFT, not its right — the reverse of the usual facing-North case. So each "immediately to the right of" step in the clues moves the next person further toward the diagram’s left: A is the reference point, B lands to A’s diagram-left, C lands further left than B, and so on. Following the full chain A → B → C → D → E, each one further left than the last, the diagram order left-to-right works out to E, D, C, B, A. Answer: E
- Four friends W, X, Y and Z are sitting in a row. Y is sitting between W and X. Z is sitting immediately to the right of X. Z is at the extreme right end. In which position (from the left) is Y sitting? Solution: Z is at position 4 (given). Z is

immediately right of X, so X is at position 3. Y is between W and X, so Y must be adjacent to X (position 3) — the only such open position is 2. So Y is at position 2. The only position left, 1, must be W. Final order: W(1), Y(2), X(3), Z(4) — Y is in the second position from the left. Answer: Second from the left

- In a row of friends, X is 4th from the left end and 6th from the right end. How many friends are in the row? Solution: Total = (position from left) + (position from right) − 1, since X is counted in both. = 4 + 6 − 1 = 9. Answer: 9 friends
- Five friends A, B, C, D and E sit in a row, all facing North. A sits at one of the ends. B is immediately to the right of A. C does not sit at either end. D is immediately to the left of E. Find the complete seating order. Solution: A is at an end: position 1 or 5. If A were at 5, "B immediately right of A" would need a 6th seat, which doesn't exist — so A is at position 1, and B is at position 2. Positions 3, 4, 5 remain for C, D, E. D is immediately left of E, so D and E occupy a consecutive pair: either (3,4) or (4,5). If D=3, E=4, then C=5 — but C cannot sit at an end, and 5 is an end, so this fails. If D=4, E=5, then C=3, which is not an end — this works. Final order: A(1), B(2), C(3), D(4), E(5). Answer: A, B, C, D, E (left to right)
- Five people sit in a row. M is between N and O. N is to the left of O. O is third from the left. P is immediately to the right of O, and Q is at the remaining position. Find the complete arrangement. Solution: "M is between N and O" with "N is to the left of O" means the three sit consecutively in the order N, M, O (left to right). O is 3rd from the left, so (working backward through the block) M is 2nd and N is 1st. P is immediately right of O (3rd), so P is 4th. The only position left, 5th, is Q. Answer: N, M, O, P, Q (left to right)
- Practice: Six students A, B, C, D, E and F sit in a row, all facing North. A is at the extreme left end. B is immediately right of A. F is at the extreme right end. E is immediately left of F. D is immediately left of E. In which position does C sit, and who are C's neighbours? (Answer: Third from the left, between B and D)
- Practice: Four friends P, Q, R and S sit in a row, all facing South. Q is immediately to the right of P. R is immediately to the right of Q. S is immediately to the right of R. Arranged left to right in a diagram, who is at the extreme left end? (Answer: S)
- Practice: Five friends J, K, L, M and N sit in a row. J is at the extreme left end. N is at the extreme right end. N is immediately to the right of M. L is sitting between K and M. Who is sitting exactly in the middle (third position)? (Answer: L)
- Practice: In a row, Y is 5th from the left end and 7th from the right end. How many people are in the row? (Answer: 11 people. 5 + 7 − 1.)
- Practice: Five friends A, B, C, D and E sit in a row, all facing North. E sits at one of the ends. D is immediately to the left of E. B does not sit at either end. A is immediately to the right of C. Find the complete seating order. (Answer: C, A, B, D, E. (E must be at position 5, since D needs a seat to its left; then testing C-A-B vs other orders in 1-2-3 shows only C(1),A(2),B(3) keeps B off the ends.))
- Practice: Five people sit in a row. M is between N and O. O is to the left of N. N is fourth from the left. P is immediately to the left of O, and Q is at the remaining position. Find the complete arrangement. (Answer: P, O, M, N, Q. (O-M-N is the consecutive block ending at N=4th, so O=2nd, M=3rd; P is 1st; Q is 5th.))
- Practice: In a row of people, K is 6th from the left and 8th from the right. If L is sitting exactly in the middle of the row, find L's position from the left. (Answer: 7th from the left. Total = 6+8−1 = 13 people; the middle position is (13+1)/2 = 7.)

Quick revision: Start with whichever clue is most restrictive — one that fixes an exact position, like "sits at the extreme left end" — before clues that only describe relationships between people; "Immediately to the right/left of X" is exact (one specific seat, one specific side). "Between X and Y" means adjacent to both — but check whether another clue is needed to tell you the order (X then Y, or Y then X); Unless stated otherwise, assume everyone faces North. If a question says everyone faces South, each person's own right and left are reversed relative to how the row is drawn left-to-right — this reversal is the single most common trap in this topic; After placing everything the clues force directly, whatever position or person is left over has only one place left to go — fill that in last, by elimination; If someone is given as "nth from the left end" AND "mth from the right end" of the same row, the total number of people in the row = n + m − 1 (the two counts both include that one person, so adding them double-counts them once); Negative clues ("X does not sit at either end," "X is not adjacent to Y") don't fix a position by themselves — use them only to rule out specific slots once the positive clues have already narrowed things down to a couple of possibilities

Double Row Seating Solved Questions

Two rows face each other, and every clue about one row has a mirror effect on the other — the method is still Seating Arrangement's clue-by-clue elimination, just tracking two rows and the "faces" relationship between them. Here's the approach, one shared puzzle with six fully worked questions, and a few more to try yourself. Draw two parallel rows of blank slots. Unless stated otherwise, the person in a given position in one row faces the person in the SAME position (counted from the same side) in the other row. Place the most restrictive clues first — an exact end position ("sits at the extreme left of Row 1") — exactly as in single-row Seating Arrangement. A "faces" clue links one slot in Row 1 directly to one slot in Row 2 — use it to transfer information you've already fixed in one row across to the other. Fill in whatever is forced directly by the clues first; the last remaining person for the last remaining slot in each row is then fixed by elimination. Always read the specific facing rule the puzzle gives rather than assuming same-position facing by default — some puzzles explicitly reverse it (position 1 in Row 1 facing the LAST position in Row 2 instead).

Examples

- Four people — A, B, C and D — sit in Row 1, facing South. Four people — P, Q, R and S — sit in Row 2, facing North, each directly facing one person in Row 1. A sits at the extreme left end of Row 1. D sits at the extreme right end of Row 1. B sits second from the left in Row 1. Q faces A. P sits immediately to the right of Q in Row 2. R faces D. Who sits at the extreme right end of Row 1? Solution: Row 1: A is at position 1 (extreme left), D is at position 4 (extreme right), B is at position 2 — by elimination, C is at position 3. Row 2: Q faces A, so Q is at position 1. P is immediately right of Q, so P is at position 2. R faces D, so R is at position 4 — by elimination, S is at position 3. Full arrangement — Row 1: A, B, C, D. Row 2: Q, P, S, R. Answer: D
- Using the same puzzle and clues, who faces B? Solution: From the full arrangement, B is at position 2 in Row 1, and the person at position 2 in Row 2 is P. Answer: P
- Using the same puzzle and clues, who sits immediately to the left of C in Row 1? Solution: From the full arrangement — A, B, C, D — the person immediately to the left of C (position 3) is B (position 2). Answer: B
- Using the same puzzle and clues, who faces the person sitting second from the left in Row 1? Solution: The person second from the left in Row 1 is B (position 2), and the person facing position 2 in Row 2 is P. Answer: P
- Using the same puzzle and clues, who sits second from the right in Row 2? Solution: Row 2, left to right, is Q, P, S, R — counted from the right, the 2nd position is S. Answer: S
- Using the same puzzle and clues, how many people sit between B and D in Row 1? Solution: Row 1 is A, B, C, D — B is at position 2 and D is at position 4, so only C (position 3) sits between them — one person. Answer: 1
- Practice: Using the same puzzle and clues, who sits at the extreme left end of Row 1? (Answer: A)
- Practice: Using the same puzzle and clues, who faces D? (Answer: R)
- Practice: Using the same puzzle and clues, who sits between Q and S in Row 2? (Answer: P)
- Practice: Using the same puzzle and clues, who sits immediately to the left of R in Row 2? (Answer: S)
- Practice: Using the same puzzle and clues, who faces C? (Answer: S)

> **Quick revision:** Draw two parallel rows of blank slots. Unless stated otherwise, the person in a given position in one row faces the person in the SAME position (counted from the same side) in the other row; Place the most restrictive clues first — an exact end position ("sits at the extreme left of Row 1") — exactly as in single-row Seating Arrangement; A "faces" clue links one slot in Row 1 directly to one slot in Row 2 — use it to transfer information you've already fixed in one row across to the other; Fill in whatever is forced directly by the clues first; the last remaining person for the last remaining slot in each row is then fixed by elimination; Always read the specific facing rule the puzzle gives rather than assuming same-position facing by default — some puzzles explicitly reverse it (position 1 in Row 1 facing the LAST position in Row 2 instead)

Circular Seating Arrangement

A circular table has no "ends," so clues are always relative to another person — not an absolute position — and left/right flips depending on whether everyone faces the center or faces outward. Here's the approach, one shared puzzle with six fully worked questions, and a few more to try yourself. There's no "extreme left" or "extreme right" on a circle — every clue describes a position relative to someone else (immediately left/right of X, opposite X), never an

absolute seat number. When everyone faces the CENTER, a seated person's own right hand points in the counter-clockwise direction as seen from above — the opposite of what a top-down map suggests. (If everyone faced outward instead, right would match clockwise.) "Opposite" only has a single, unambiguous seat when the total number of people is even — directly across the circle. With an odd number of people, no seat is exactly opposite another, so well-posed questions avoid relying on it. Fix one person's seat as a reference point (position doesn't matter which, since the whole arrangement can be rotated), then place everyone else by their stated relationship to that person or to each other.

Examples

- Six people — A, B, C, D, E and F — sit around a circular table, all facing the center. A sits immediately to the right of B. C sits immediately to the left of B. D sits directly opposite B. E sits immediately to the right of D. F sits immediately to the left of D. Who sits immediately to the right of A? Solution: Fix B's seat as a reference. Since everyone faces the center, "right" runs counter-clockwise: A (immediately right of B) is the next seat counter-clockwise from B, and C (immediately left of B) is the next seat clockwise from B. D is directly opposite B. E (immediately right of D) is the next seat counter-clockwise from D; F (immediately left of D) is the next seat clockwise from D. Going clockwise around the table: B, C, E, D, F, A — and back to B. The seat immediately to the right (counter-clockwise) of A is F. Answer: F
- Using the same arrangement, who sits directly opposite E? Solution: From the full clockwise order — B, C, E, D, F, A — E and A are three seats apart in either direction, which is directly opposite on a table of six. Answer: A
- Using the same arrangement, who sits immediately to the left of A? Solution: "Left" runs clockwise when facing the center. The next seat clockwise from A, going back to the start of the order (B, C, E, D, F, A), is B. Answer: B
- Using the same arrangement, how many people sit between C and F, counting clockwise starting from C? Solution: From the clockwise order B, C, E, D, F, A: starting right after C and moving clockwise, E and D come before reaching F — 2 people. Answer: 2
- Using the same arrangement, how many people sit between D and A, counting counter-clockwise starting from D? Solution: Moving counter-clockwise from D (the reverse of the clockwise order B, C, E, D, F, A) visits E, then C, then B, then A — so E, C and B sit between D and A. Answer: 3
- Using the same arrangement, who sits two seats to the right of C? Solution: "Right" moves counter-clockwise. One seat right of C is B; two seats right of C is A. Answer: A
- Practice: Using the same arrangement, who sits directly opposite A? (Answer: E)
- Practice: Using the same arrangement, who sits immediately to the left of F? (Answer: A)
- Practice: Using the same arrangement, how many people sit between B and D, counting clockwise starting from B? (Answer: 2)
- Practice: Using the same arrangement, who sits two seats to the left of E? (Answer: F)
- Practice: Using the same arrangement, how many people sit between A and D, counting clockwise starting from A? (Answer: 3)

> **Quick revision:** There's no "extreme left" or "extreme right" on a circle — every clue describes a position relative to someone else (immediately left/right of X, opposite X), never an absolute seat number; When everyone faces the CENTER, a seated person's own right hand points in the counter-clockwise direction as seen from above — the opposite of what a top-down map suggests. (If everyone faced outward instead, right would match clockwise.); "Opposite" only has a single, unambiguous seat when the total number of people is even — directly across the circle. With an odd number of people, no seat is exactly opposite another, so well-posed questions avoid relying on it; Fix one person's seat as a reference point (position doesn't matter which, since the whole arrangement can be rotated), then place everyone else by their stated relationship to that person or to each other

Mixed-Direction Seating Arrangement

Most seating arrangement questions have everyone facing the same way, but some mix it up — a few people face North and others face South, so "immediately to X's right" depends on which way X personally faces, not on the row as drawn on paper. Here's the approach, one shared puzzle with six fully worked questions, and a few more to try yourself. Always separate "physical" position (the row as drawn, left to right on the page) from a person's "own" right/left — the two only match when that person faces North (the usual default). When a person faces South, their

own right and left are reversed relative to the row as drawn: their own right points to the physical LEFT, and their own left points to the physical RIGHT. A clue like "the extreme left end" or "third from the left" is always about the physical row, never about anyone's own perspective — only "immediately to X's right/left" depends on which way X faces. Check every person's facing direction before answering a perspective-based question — reading "right" as the physical right when the person actually faces South is the single most common mistake in this topic. When several people face South, apply the left-right reversal to EACH of them individually based on their own facing direction — don't assume the whole row's perspective flips together just because more than one person faces South.

Examples

- Five friends — A, B, C, D and E — sit in a row. All of them face North, except A, who faces South. C sits at the extreme left end. A sits third from the left. The person sitting to the immediate right of A, from A's own perspective, is E. D sits at the extreme right end. B sits immediately to the left of D. Who sits second from the left? Solution: C is at position 1 (extreme left) and A is at position 3 (third from the left). A faces South, so A's own right points to the physical LEFT — the immediate right of A, from A's own perspective, is therefore physically at position 2, not position 4. That person is E, so E is at position 2. D is at position 5 (extreme right), and B sits immediately to its left, so B is at position 4. The full physical order is: C (1), E (2), A (3), B (4), D (5). Position 2 is E. Answer: E
- Using the same arrangement, who sits immediately to the physical left of A (regardless of which way anyone faces)? Solution: From the full order C, E, A, B, D, A is at position 3. The person physically immediately to its left, at position 2, is E. Answer: E
- Using the same arrangement, who faces South? Solution: Only A was stated to face South; everyone else faces North. Answer: A
- Using the same arrangement, from B's own perspective, who sits immediately to B's right? Solution: B faces North (everyone except A does), so B's own right matches the physical right. B is at position 4; the physical position immediately to its right, position 5, is D. Answer: D
- Using the same arrangement, from D's own perspective, who sits immediately to D's left? Solution: D faces North (only A faces South), so D's own left matches the physical left. D is at position 5; the physical position immediately to its left, position 4, is B. Answer: B
- Using the same arrangement, how many people sit between A and D (physical positions)? Solution: A is at position 3 and D is at position 5 — only position 4, B, sits between them. Answer: 1
- Practice: Using the same arrangement, from C's own perspective, who sits immediately to C's right? (Answer: E)
- Practice: Using the same arrangement, who sits at the extreme right end? (Answer: D)
- Practice: Using the same arrangement, from A's own perspective, who sits immediately to A's left? (Answer: B)
- Practice: Using the same arrangement, who sits third from the right (physical position)? (Answer: A)
- Practice: Using the same arrangement, from E's own perspective, who sits immediately to E's left? (Answer: C)

> **Quick revision:** Always separate "physical" position (the row as drawn, left to right on the page) from a person's "own" right/left — the two only match when that person faces North (the usual default); When a person faces South, their own right and left are reversed relative to the row as drawn: their own right points to the physical LEFT, and their own left points to the physical RIGHT; A clue like "the extreme left end" or "third from the left" is always about the physical row, never about anyone's own perspective — only "immediately to X's right/left" depends on which way X faces; Check every person's facing direction before answering a perspective-based question — reading "right" as the physical right when the person actually faces South is the single most common mistake in this topic; When several people face South, apply the left-right reversal to EACH of them individually based on their own facing direction — don't assume the whole row's perspective flips together just because more than one person faces South

Free practice questions: parikshasaathi.com/q/seating-arrangement/

Statement-Based Reasoning

Statement and Assumption Solved Questions

An assumption is something the speaker must be silently taking for granted for their statement to make sense — not something they said, and not a conclusion drawn from what they said. Here's the approach, six fully worked examples covering the patterns that come up most, and a few to try yourself. Test each candidate assumption by asking: "if this were FALSE, would the statement still make sense?" If the statement falls apart or becomes pointless without it, it IS a necessary assumption. If the statement still works fine without it, it is NOT. Don't confuse an assumption with the stated content itself (what the speaker directly said) or with a conclusion drawn from the statement — an assumption is specifically something unstated that the statement silently depends on. Notices, signs and advertisements almost always assume there's a reason for issuing them — that at least some people might otherwise do the opposite, or that some people would be interested. They do NOT usually assume guaranteed universal compliance or interest. A request or question usually assumes the listener is capable of fulfilling it, or likely to know the answer — that's why that specific request was made to that specific person. A policy or decision statement ("the government/company/school should/has decided to do X") assumes that X is at least feasible to carry out — it does not automatically assume X will work perfectly or that everyone affected will respond in a particular way.

Examples

- Statement: "Admissions open for the new batch. Apply now!" — a coaching institute's advertisement. Assumptions: I. Some people would be interested in applying. II. The new batch has already started. Solution: I: Advertisements only make sense if there's a potential audience interested in what's offered — without that, advertising would be pointless. This is assumed. II: "Admissions open" suggests the batch has NOT started yet, if anything — this isn't assumed, and even contradicts the statement. Answer: Only assumption I is valid
- Statement: "Keep off the grass." — a sign in a park. Assumptions: I. Some people might walk on the grass if not told not to. II. All visitors will obey the sign. Solution: I: A sign like this is put up precisely because there's a real possibility people would otherwise walk on the grass. This is assumed. II: Putting up a sign doesn't require assuming 100% compliance — signs exist because not everyone obeys by default, with or without one. Answer: Only assumption I is valid
- Statement: "The company has decided to increase the price of its product from next month." Assumptions: I. Customers will stop buying the product due to the price increase. II. The company needs more profit to survive. Solution: I: Deciding to raise the price doesn't assume customers will STOP buying — if anything, the opposite (that enough customers will keep buying) is what would make the decision sensible. II: The statement doesn't require this specific reason — there could be many other reasons (rising costs, higher demand) for a price increase, so this isn't a necessary assumption. Answer: Neither assumption is valid
- Statement: "What time does the next train to Delhi leave?" — asked by a passenger at a railway inquiry counter. Assumptions: I. The person asked is likely to know the train timings. II. There is a next train to Delhi. Solution: I: Asking a specific question at an inquiry counter assumes that counter can plausibly answer it — that's the whole reason to ask there. II: Asking "what time does the NEXT train leave" presupposes there is one — otherwise the question wouldn't make sense in that form. Answer: Both assumptions are valid
- Statement: "Buy our new smartphone, now available with a 2-year warranty." — an advertisement. Assumptions: I. Some customers value a longer warranty period. II. All customers will buy the smartphone because of the warranty. Solution: I: Highlighting the warranty as a selling point only makes sense if at least some buyers care about it. This is assumed. II: An advertisement doesn't assume every single customer will buy — that's a far stronger claim than the statement needs. Answer: Only assumption I is valid
- Statement: "The school has decided to introduce a new online portal for submitting homework." Assumptions: I. Students have access to the internet and a device to use the portal. II. The current method of submitting homework has some drawback. Solution: I: An online portal is unusable without internet access and a device — the decision necessarily assumes students can get online. This is assumed. II: Deciding to introduce a new system in place of an existing one assumes there's some reason for the change — otherwise the decision wouldn't make sense. This is also assumed. Answer: Both assumptions are valid

- Practice: Statement: "Please do not disturb. Meeting in progress." — a sign on a conference room door. Assumptions: I. Someone might otherwise enter and disturb the meeting. II. The meeting will continue for the rest of the day. (Answer: Only assumption I is valid)
- Practice: Statement: "All employees must submit their annual reports by Friday." Assumptions: I. Some employees have not yet submitted their reports. II. All employees are capable of completing their reports by Friday. (Answer: Only assumption II is valid)
- Practice: Statement: "Mumbai is the financial capital of India." Assumptions: I. Some cities in India are not financial capitals. II. The speaker has visited Mumbai. (Answer: Only assumption I is valid)
- Practice: Statement: "Please maintain silence in the library." — a notice. Assumptions: I. Some people might talk if not asked not to. II. The library is always completely silent. (Answer: Only assumption I is valid)
- Practice: Statement: "The company will give a 10% bonus to employees who complete the project before the deadline." Assumptions: I. Some employees are capable of completing the project before the deadline. II. All employees will try to finish early because of the bonus. (Answer: Only assumption I is valid)

> **Quick revision:** Test each candidate assumption by asking: "if this were FALSE, would the statement still make sense?" If the statement falls apart or becomes pointless without it, it IS a necessary assumption. If the statement still works fine without it, it is NOT; Don't confuse an assumption with the stated content itself (what the speaker directly said) or with a conclusion drawn from the statement — an assumption is specifically something unstated that the statement silently depends on; Notices, signs and advertisements almost always assume there's a reason for issuing them — that at least some people might otherwise do the opposite, or that some people would be interested. They do NOT usually assume guaranteed universal compliance or interest; A request or question usually assumes the listener is capable of fulfilling it, or likely to know the answer — that's why that specific request was made to that specific person; A policy or decision statement ("the government/company/school should/has decided to do X") assumes that X is at least feasible to carry out — it does not automatically assume X will work perfectly or that everyone affected will respond in a particular way

Statement and Conclusion Solved Questions

A conclusion "follows" only if it's a direct, inevitable restatement or combination of what the statement already says — nothing borrowed from outside knowledge or common sense. Here's the approach, six fully worked examples, and a few to try yourself. Unlike Syllogism (general class relationships like "All A are B") or Statement and Assumption (unstated premises), Statement and Conclusion gives factual statements and asks which conclusions follow directly from them alone. A conclusion follows only if it's a direct, inevitable restatement or combination of what the statement already says — not something merely probable, common-sense, or requiring outside information. Be suspicious of conclusions that go beyond the statement's scope — adding a cause, a comparison, or a generalisation the statement itself never made is the most common trap. The statement saying X happened doesn't mean it said X happened BECAUSE of Y. When multiple statements are given together, check whether the conclusion validly combines them (like chaining two comparisons) rather than assuming a connection the statements never actually established. An "either...or" statement logically guarantees that if one of the two named things is ruled out, the other must hold — but it does NOT guarantee both happen together, unless the statement explicitly says so.

Examples

- Statement: "The number of applicants for the exam this year is 20% higher than last year." Conclusions: I. More people are interested in the exam this year than last year. II. The exam has become more difficult this year. Solution: I: Applying is a direct measure of interest, so more applicants directly means more interest — this follows. II: The statement says nothing about difficulty; that's an unstated guess about cause, not what was actually said. Answer: Only conclusion I follows
- Statement: "All the 50 employees of the company attended the training session held last week." Conclusions: I. The company has 50 employees. II. The training session was held last week. Solution: I: Directly stated ("the 50 employees"). II: Directly stated ("held last week"). Answer: Both conclusions follow
- Statement: "Company X's profits increased for three consecutive years, but fell sharply in the fourth year." Conclusions: I. The company faced some problem in the fourth year. II. The company's management changed in the fourth year. Solution: I: A profit fall doesn't directly prove any specific "problem" — it could result from many things (a one-time

policy change, a deliberate price cut), so this isn't a direct logical derivation. II: The statement says nothing about management at all; this is entirely unsupported. Answer: Neither conclusion follows

- Statement: "Ramesh is taller than Suresh, and Suresh is taller than Mohan." Conclusions: I. Ramesh is taller than Mohan. II. Mohan is the shortest among the three. Solution: I: Combining Ramesh > Suresh > Mohan directly gives Ramesh > Mohan. II: Mohan sits at the bottom of the full established order among exactly these three, so Mohan is directly the shortest. Answer: Both conclusions follow
- Statement: "Out of 500 candidates who appeared for an exam, 320 were men and the rest were women." Conclusions: I. 180 women appeared for the exam. II. The exam was more difficult for the women candidates. Solution: I: 500 − 320 = 180 — a direct arithmetic restatement of the given numbers. This follows. II: The statement gives no information about difficulty for either group; this is entirely unsupported. Answer: Only conclusion I follows
- Statement: "Either the manager or the supervisor will attend tomorrow's meeting." Conclusions: I. If the manager does not attend, the supervisor will attend. II. Both the manager and the supervisor will attend. Solution: I: An "either...or" statement guarantees that if one option is ruled out, the other must happen — this follows directly. II: The statement only guarantees at least one of them attends, not that both do — this goes beyond what was said. Answer: Only conclusion I follows
- Practice: Statement: "The price of petrol has been reduced by the government with effect from Monday." Conclusions: I. The price of petrol was higher before Monday. II. People will buy more petrol from Monday onwards. (Answer: Only conclusion I follows)
- Practice: Statement: "Of the 100 students who appeared for the exam, 80 passed." Conclusions: I. 20 students failed the exam. II. All 100 students studied equally hard. (Answer: Only conclusion I follows)
- Practice: Statement: "City A receives more annual rainfall than City B, and City B receives more annual rainfall than City C." Conclusions: I. City A receives more rainfall than City C. II. City C receives the least rainfall among the three. (Answer: Both conclusions follow)
- Practice: Statement: "City P has a population of 2 lakh, and City Q has a population of 3.5 lakh." Conclusions: I. City Q is more populated than City P. II. City P will have as large a population as City Q within 5 years. (Answer: Only conclusion I follows)
- Practice: Statement: "Either the fan or the air conditioner in the room is malfunctioning." Conclusions: I. If the fan is not malfunctioning, the air conditioner is. II. Neither the fan nor the air conditioner is malfunctioning. (Answer: Only conclusion I follows)

> **Quick revision:** Unlike Syllogism (general class relationships like "All A are B") or Statement and Assumption (unstated premises), Statement and Conclusion gives factual statements and asks which conclusions follow directly from them alone; A conclusion follows only if it's a direct, inevitable restatement or combination of what the statement already says — not something merely probable, common-sense, or requiring outside information; Be suspicious of conclusions that go beyond the statement's scope — adding a cause, a comparison, or a generalisation the statement itself never made is the most common trap. The statement saying X happened doesn't mean it said X happened BECAUSE of Y; When multiple statements are given together, check whether the conclusion validly combines them (like chaining two comparisons) rather than assuming a connection the statements never actually established; An "either...or" statement logically guarantees that if one of the two named things is ruled out, the other must hold — but it does NOT guarantee both happen together, unless the statement explicitly says so

Course of Action Solved Questions

A course of action is judged by whether it's a practical, proportionate response to the specific problem described — not whether it sounds like a nice idea in general. Here's the approach, six fully worked examples covering the patterns that come up most, and a few to try yourself. A valid course of action must be practical (actually implementable, not vague), directly related to the stated problem (not a tangent), and reasonable given only the information in the statement — not something requiring facts that aren't stated. A course of action framed as "ban/shut down/eliminate X entirely" is often too extreme to be the best response, unless the statement specifically supports something that drastic — moderate, targeted actions are usually favoured over sweeping ones. Don't confuse a course of action with a conclusion (which describes what IS or WILL happen) or an assumption (something taken for granted) — a course of action is specifically about what SHOULD BE DONE in response. When

a proposed action's scale is wildly out of proportion to the scale of the problem described (a permanent ban over a minor, fixable issue), that mismatch is usually the clearest sign it doesn't follow. An action that only manages the symptom (like a warning or a temporary fix) rather than removing the root cause can still follow, as long as it's a reasonable, proportionate response to exactly what the statement describes — the test is proportion and relevance, not whether it's the most thorough possible fix.

Examples

- Statement: "Many students in the school have been falling sick due to contaminated water from the school's old water tank." Courses of Action: I. The school should get the water tank cleaned and the water tested regularly. II. The school should be shut down permanently. Solution: I: Directly and practically addresses the stated cause (the contaminated tank). This follows. II: Permanently shutting the school is a disproportionate response to a fixable maintenance problem. This does not follow. Answer: Only course of action I follows
- Statement: "The number of road accidents at a particular junction has increased significantly over the past year." Courses of Action: I. The traffic police should install proper signals and signage at the junction. II. All vehicles should be banned from using that road permanently. Solution: I: A direct, proportionate step to reduce accidents at that specific junction. This follows. II: Banning all vehicles permanently is an extreme overreaction not justified by an accident-rate problem. This does not follow. Answer: Only course of action I follows
- Statement: "Sales of the company's flagship product have declined for three consecutive quarters." Courses of Action: I. The company should investigate customer feedback and competitor offerings to understand the decline. II. The company should launch a marketing campaign highlighting the product's existing strengths. Solution: I: Investigating causes before acting is a sensible first step. This follows. II: A marketing campaign is also a standard, proportionate business response that can run alongside the investigation. This follows too. Answer: Both courses of action follow
- Statement: "A particular stationery item's price has increased slightly due to a rise in raw material costs." Courses of Action: I. The government should impose a complete ban on the sale of that item. II. The company should permanently stop manufacturing all its other products too. Solution: I: A government ban over a slight, cost-driven price increase is wildly disproportionate. This does not follow. II: Stopping all other products has nothing to do with this one item's price — a complete non-sequitur. This does not follow. Answer: Neither course of action follows
- Statement: "Many commuters have complained about overcrowding on a particular bus route during peak hours." Courses of Action: I. The transport authority should increase the frequency of buses on that route during peak hours. II. The transport authority should permanently discontinue that bus route. Solution: I: A direct, proportionate step that targets exactly the described problem (overcrowding at peak hours). This follows. II: Discontinuing the route removes commuters' only option and worsens crowding on alternatives — the opposite of a reasonable response. This does not follow. Answer: Only course of action I follows
- Statement: "A particular medicine has been found to cause mild side effects in a small percentage of patients." Courses of Action: I. The manufacturer should add a clear warning label listing the known side effects. II. The government should ban the medicine completely. Solution: I: A proportionate, standard response to a known but mild and infrequent risk — informs patients without removing a medicine that helps most of them. This follows. II: A complete ban over mild side effects in only a small percentage of patients is far more drastic than the problem warrants. This does not follow. Answer: Only course of action I follows
- Practice: Statement: "A bridge connecting two villages has developed minor cracks after years of use." Courses of Action: I. The bridge should be permanently closed and never used again. II. The bridge should be inspected by engineers and repaired if needed. (Answer: Only course of action II follows)
- Practice: Statement: "Many employees have complained about the lack of proper ventilation in the office building." Courses of Action: I. The management should install proper ventilation systems in the building. II. The office should relocate to an entirely new city. (Answer: Only course of action I follows)
- Practice: Statement: "A school has noticed that many students are arriving late due to traffic congestion near the main gate." Courses of Action: I. The school should consider adjusting the start time slightly to avoid peak traffic hours. II. The school should coordinate with local traffic police to manage congestion near the gate during school hours. (Answer: Both courses of action follow)
- Practice: Statement: "Customer complaints about delayed deliveries have increased for an e-commerce company over the last quarter." Courses of Action: I. The company should review and strengthen its logistics and delivery partner network. II. The company should shut down its online operations permanently. (Answer: Only course of action I follows)

- Practice: Statement: "A viral infection has been spreading in one locality of a city." Courses of Action: I. The health department should run awareness campaigns and set up medical check-up camps in that locality. II. The entire city should be placed under a permanent lockdown. (Answer: Only course of action I follows)

> **Quick revision:** A valid course of action must be practical (actually implementable, not vague), directly related to the stated problem (not a tangent), and reasonable given only the information in the statement — not something requiring facts that aren't stated; A course of action framed as "ban/shut down/eliminate X entirely" is often too extreme to be the best response, unless the statement specifically supports something that drastic — moderate, targeted actions are usually favoured over sweeping ones; Don't confuse a course of action with a conclusion (which describes what IS or WILL happen) or an assumption (something taken for granted) — a course of action is specifically about what SHOULD BE DONE in response; When a proposed action's scale is wildly out of proportion to the scale of the problem described (a permanent ban over a minor, fixable issue), that mismatch is usually the clearest sign it doesn't follow; An action that only manages the symptom (like a warning or a temporary fix) rather than removing the root cause can still follow, as long as it's a reasonable, proportionate response to exactly what the statement describes — the test is proportion and relevance, not whether it's the most thorough possible fix

Statement and Argument Solved Questions

A strong argument gives a specific, weighty reason that directly addresses the question — a weak argument is vague, trivial, or beside the point, even if it sounds reasonable on first read. Here's the approach, six fully worked examples covering each possible pattern, and a few to try yourself. A strong argument must be both relevant to the question and important/weighty — a real, practical consequence or reason, not a passing preference or a superficial point. An argument that states a general truism, a vague preference ("people like X"), or a throwaway comparison to something unrelated is weak, even if it isn't factually wrong. An argument that doesn't actually address the specific question asked — or answers a different, broader question — is weak, however reasonable it sounds standing alone. Judge "yes" and "no" arguments independently of each other — a question can have a strong case on both sides, on neither side, or on only one. An argument built on a vague, unspecified fear ("it could be misused," "something might go wrong") is weak unless it explains specifically how or why that risk is likely — a specific, named consequence is strong; a generic worry is not.

Examples

- Statement: Should voting be made mandatory for all eligible citizens? Arguments: I. Yes, mandatory voting would increase voter turnout and ensure governments better reflect the will of the majority. II. No, people should be free to do whatever they want. Solution: I: Gives a specific, weighty reason — better representation through higher turnout. Strong. II: A vague generalization about freedom that doesn't engage with the specific tradeoffs of mandatory voting. Weak. Answer: Only argument I is strong
- Statement: Should smoking be banned in all public places? Arguments: I. No, people have been smoking for centuries, so it should continue. II. Yes, passive smoking harms the health of non-smokers who have no choice in the matter. Solution: I: Tradition alone isn't a reason to continue something with proven harms — this doesn't engage with the actual issue. Weak. II: A specific, weighty harm to non-consenting third parties — directly relevant to why a ban might be justified. Strong. Answer: Only argument II is strong
- Statement: Should schools introduce compulsory computer education from an early age? Arguments: I. Yes, early exposure to technology will better prepare students for a digital economy. II. No, it would require significant investment in infrastructure and teacher training that many schools cannot currently afford. Solution: I: A specific, weighty future benefit directly tied to the proposal. Strong. II: A specific, weighty practical constraint directly tied to the proposal. Strong. Answer: Both arguments are strong
- Statement: Should the government increase funding for space research? Arguments: I. Yes, because space is vast and interesting. II. No, because other countries also fund space research. Solution: I: "Interesting" isn't a weighty justification for a funding priority — too vague. Weak. II: Other countries' funding choices don't address whether this government should increase its own funding. Weak. Answer: Neither argument is strong
- Statement: Should the use of private vehicles be restricted in city centres? Arguments: I. Yes, it would reduce traffic congestion and air pollution in densely populated areas. II. No, because some people might not like the restriction. Solution: I: Names specific, weighty, measurable consequences (congestion, pollution) directly tied to the proposal.

Strong. II: "Might not like it" is a vague personal reaction, not a weighty practical consequence. Weak. Answer: Only argument I is strong

- Statement: Should higher education be made completely free for all students? Arguments: I. Yes, it would make education accessible to economically weaker sections who currently cannot afford it. II. No, it would require the government to allocate significantly more funds, which could affect other essential public services. Solution: I: A specific, weighty benefit (access for those currently priced out) directly tied to the proposal. Strong. II: A specific, weighty cost (funding tradeoffs against other services) directly tied to the proposal. Strong. Answer: Both arguments are strong
- Practice: Statement: Should plastic bags be banned in retail stores? Arguments: I. Yes, plastic bags take hundreds of years to decompose and cause significant environmental harm. II. No, people like using plastic bags. (Answer: Only argument I is strong)
- Practice: Statement: Should employees be allowed to work from home permanently? Arguments: I. Yes, it reduces commuting time and increases work-life balance for employees. II. No, it can reduce spontaneous collaboration and weaken team cohesion over time. (Answer: Both arguments are strong)
- Practice: Statement: Should the city build a new stadium? Arguments: I. Yes, because sports are fun. II. No, because the old stadium already exists. (Answer: Neither argument is strong)
- Practice: Statement: Should companies be required to publicly disclose their environmental impact? Arguments: I. Yes, it would hold companies accountable and help consumers make informed choices. II. No, because the information might be misused. (Answer: Only argument I is strong)
- Practice: Statement: Should remote work be made a permanent option for all office employees? Arguments: I. Yes, it reduces commuting costs and time for employees. II. No, because some managers personally prefer seeing employees in the office. (Answer: Only argument I is strong)

> **Quick revision:** A strong argument must be both relevant to the question and important/weighty — a real, practical consequence or reason, not a passing preference or a superficial point; An argument that states a general truism, a vague preference ("people like X"), or a throwaway comparison to something unrelated is weak, even if it isn't factually wrong; An argument that doesn't actually address the specific question asked — or answers a different, broader question — is weak, however reasonable it sounds standing alone; Judge "yes" and "no" arguments independently of each other — a question can have a strong case on both sides, on neither side, or on only one; An argument built on a vague, unspecified fear ("it could be misused," "something might go wrong") is weak unless it explains specifically how or why that risk is likely — a specific, named consequence is strong; a generic worry is not

Cause and Effect Solved Questions

Given two statements, the question is how they relate: does one cause the other, are they both effects of some third, unstated cause, or are they simply unrelated? Here's the approach, six fully worked examples covering each pattern, and a few to try yourself. If statement II describes something that would naturally and directly result from statement I, then I is the cause and II is the effect. If the direction is reversed — I is the kind of thing that would naturally result from II — then II is the cause and I is the effect. If both statements describe similar, simultaneous outcomes (like two unrelated institutions closing on the same days) that are too similar to be coincidence but neither directly causes the other, they're likely both effects of some common, unstated cause. If the two statements describe genuinely separate, unrelated events with no plausible causal link either way and no obvious shared trigger, they're independent of each other. The ORDER the statements are given in doesn't decide which is the cause — a statement describing the effect is sometimes listed first. Always judge the direction by which event could plausibly produce the other, not by which one appears as "I".

Examples

- I. A company announced a significant price cut on its flagship product. II. Sales of the product increased sharply over the following month. Solution: A price cut naturally and directly leads to higher sales — this is a textbook direct cause-and-effect pairing in this order. Answer: I is the cause and II is its effect
- I. Several low-lying areas in a region were flooded. II. The region experienced heavy rainfall for three consecutive days. Solution: Heavy rainfall is what naturally causes flooding — here, the cause (II) is stated second and the effect (I) is stated first, so it's the reverse pairing. Answer: II is the cause and I is its effect

- I. Schools in a district remained closed for two days. II. Government offices in the same district also remained closed for the same two days. Solution: Neither closing directly causes the other — schools don't close because offices do, or vice versa. Both closing on the exact same days strongly suggests a shared, unstated trigger (such as a district-wide weather warning or a declared local holiday). Answer: Both I and II are effects of some common cause
- I. The company's sales team exceeded its quarterly target. II. The company's new office building was completed ahead of schedule. Solution: These describe two separate departments' unrelated outcomes, with no plausible causal link between them and no obvious shared trigger — they're simply independent events. Answer: I and II are independent events
- I. A particular factory started using new, more efficient machinery last month. II. The factory's production output increased noticeably this month. Solution: Installing more efficient machinery is exactly the kind of change that naturally and directly raises output soon after — a textbook direct cause-and-effect pairing in this order. Answer: I is the cause and II is its effect
- I. Two of a company's factories, in different states, both reported a dip in output during the same week. II. Both states experienced an unusually severe heatwave during that week. Solution: A severe heatwave naturally causes reduced factory output (heat-related safety limits, power cuts, shorter shifts) — here the cause (II) is stated second and the effect (I) is stated first, so it's the reverse pairing. Answer: II is the cause and I is its effect
- Practice: I. The government increased the import duty on a certain category of electronics. II. The retail price of that electronics category rose in the following weeks. (Answer: I is the cause and II is its effect)
- Practice: I. Several flights were delayed at an airport. II. Train services on nearby routes were also disrupted around the same time. (Answer: Both I and II are effects of some common cause)
- Practice: I. A cafe near an office introduced a new menu item. II. The office's annual sports day was rescheduled to the following month. (Answer: I and II are independent events)
- Practice: I. A particular online retailer offered a large discount during a festival sale. II. The retailer recorded its highest-ever single-day sales during that festival sale. (Answer: I is the cause and II is its effect)
- Practice: I. A city recorded an unusually high number of hospital visits for heat-related illness one week. II. The city experienced an intense heatwave that same week. (Answer: II is the cause and I is its effect)

> **Quick revision:** If statement II describes something that would naturally and directly result from statement I, then I is the cause and II is the effect; If the direction is reversed — I is the kind of thing that would naturally result from II — then II is the cause and I is the effect; If both statements describe similar, simultaneous outcomes (like two unrelated institutions closing on the same days) that are too similar to be coincidence but neither directly causes the other, they're likely both effects of some common, unstated cause; If the two statements describe genuinely separate, unrelated events with no plausible causal link either way and no obvious shared trigger, they're independent of each other; The ORDER the statements are given in doesn't decide which is the cause — a statement describing the effect is sometimes listed first. Always judge the direction by which event could plausibly produce the other, not by which one appears as "I"

Revision sheet

Every lesson’s quick-revision box in one place, for the last read before the exam.

Analogies: Meaning, Letters, Numbers and Figures	Preserve A→B as C→D; use stated word meanings and explicit letter/number rules; for figures track shape, count, position, orientation and fill.
Analogy Solved Questions	Name the relationship between the first pair in words before looking at the options — "tool used by," "type of," "opposite of," "part of" — a vague sense of "these are related somehow" leads to the wrong option; Apply that exact same relationship, in the exact same direction (first word → second word), to the third word. Reversing the direction partway through is a common mistake; For number analogies, check standard operations in order: a fixed addition/subtraction, a fixed multiplication/division, then squares or cubes; If more than one option seems plausible, go back and restate the relationship more precisely — a precise relationship usually rules out all but one option; Letter analogies apply the same alphabet-position shift or pattern to each letter of a word, exactly like Coding-Decoding — e.g. if the first pair shows every letter moved forward by a fixed number of places, apply that same shift letter-by-letter to the new word; Collective-noun analogies pair a specific group-name with what it's a group OF (a "Bouquet" is a group of "Flowers") — name the group-type relationship explicitly rather than just sensing the words are connected; Watch for two relationships that look similar on the surface but aren't logically the same type — "Author is to Book" (a creator and their creation) is a different kind of relationship from "Teacher is to Student" (a role and the person it acts upon), even though both pairs describe two things professionally linked to each other
Blood relations: reading a family statement	Build the family tree step by step, tracking generation and gender for every person. "My father's only son" (no brothers) = the speaker. A person can't be their own grandfather's son — that phrase always points to the generation between them. In-law relations arise only through marriage, not blood.
Blood Relation Solved Questions	Trace one relationship at a time. Convert each clue into a small family-tree sketch (even mentally) before jumping to the answer; "Only son" / "only daughter" is a strong clue — it tells you there’s exactly one person matching that description, which usually lets you identify a specific person rather than a category; Watch whose perspective the sentence is told from — "my mother’s mother" is the speaker’s grandmother, not the listener’s; Memorize the common compound chains instead of re-deriving them every time: father's/mother's son = brother; father's/mother's daughter = sister; mother's brother = maternal uncle; father's brother = paternal uncle; a spouse's sibling = brother-in-law/sister-in-law; Unless a question specifically says "step," "half" or "adopted," assume every sibling relation is a full (same-parents) relation — this is what makes statements like "A and B are sisters, so they share the same brothers" valid; For "how many members in this family" questions, list every person named along with their known relation to one fixed reference person, then count the list — don't try to track the count in your head while reading; Watch for the "generation-skip" trick: a clue like "A's father is B's son" doesn't make B a sibling of A's father — it makes B A's grandparent, since B is the PARENT of A's father; After finding the final relationship, re-check it against both people's genders and generations implied by the question — a "daughter" answer requires a female, and a "grandfather" answer requires someone one generation above a parent

Family Tree (Blood Relations)	Build the tree top to bottom as you read each clue — the oldest generation at the top, their children below, their children's children below that; Mark every person's gender the moment it's given (directly, or implied by a word like "husband," "sister," or "son") — the final relationship name (uncle vs aunt, grandson vs granddaughter) always depends on it; A married-in person (a husband or wife who isn't a blood descendant) still belongs on the tree at their spouse's generation level, connected sideways rather than by a line of descent; Once the tree is drawn, read relationships directly off it by counting generations and tracing the connecting line — this is far more reliable than trying to reason through a long relationship chain in your head; A "how many X are mentioned" question only counts people the clues actually name or clearly establish — don't assume additional unmentioned siblings, spouses or children exist just because a real family might plausibly have them
Classification: finding the odd one out	Test a candidate rule against EVERY item, not just two. Common rule families: category membership, prime/composite/square, a hidden arithmetic link within each item, and structural properties (curved vs straight edges, etc.).
Classification (Odd One Out)	Look for the rule that groups most of the items: a shared category, a shared mathematical property (prime, perfect square, even), a shared word-pattern, or a shared relationship between parts of each item; Check EVERY item against your hypothesized rule before answering — if your rule only explains 3 of 4 items and leaves a different one out than you expected, the rule itself is wrong, not just your answer; When items could be grouped more than one way, the correct rule is the one that cleanly separates exactly ONE item from the rest — if a rule leaves two items looking "odd", that's not the intended rule; For pairs or sets of numbers, check the relationship within each pair first (ratio, difference, square, sum) before comparing across pairs — the odd one out usually breaks that specific internal relationship; If every item seems to belong to the same obvious category (all animals, all shapes) and no meaning-based rule separates one of them, look for a hidden structural rule instead — letter count, number of sides, or a shared sub-property within that category
Odd Pair Out Solved Questions	Check the relationship within each pair individually first (does the second number look like a square, cube, a simple multiple, or a product of the first number with something?) before comparing across pairs; Test your hypothesized relationship against every pair, not just the first two — a rule that fits three out of four pairs (and breaks only on the fourth) is the intended rule; Common relationships to try, in order: second = first^2, second = first^3, second = first × a fixed number, second = first × (first + a fixed number); Once you've confirmed a relationship holds for three pairs, calculate what the fourth pair's second number SHOULD be under that same relationship — this confirms the odd pair with certainty, rather than just a hunch; Not every pair relationship is multiplicative — if squares, cubes and multiples all fail, check a simple additive one instead: second = first + a fixed number, or first + second = a fixed total
Logical Sequence of Words Solved Questions	First identify what kind of order is being asked for — size/hierarchy (smallest to largest), a real-world process (what logically happens first), or dictionary (alphabetical) order; For hierarchy questions, think of the real-world containment: a smaller unit sits inside a larger one (a village is inside a block, a block inside a district), and that containment gives the order directly; For process questions, think through the real sequence of events as they'd actually happen, step by step, rather than guessing from how important or familiar each word sounds; For dictionary order, compare words letter by letter at the first point they differ — and when one word is an exact prefix of another (like "Broth" and "Brother"), the shorter word always comes first; Decide the category from the actual words given, not from how the question is phrased — a set of words can look like it needs a process order but actually only has a clean hierarchy (or vice versa), so check what the words themselves describe before committing

Letter Group Classification	Convert every letter to its position number (A=1, B=2, … Z=26) first, exactly as in Alphabet Series — comparing numbers is far less error-prone than counting letters in your head; Find the gap between consecutive letters in each group (second − first, third − second). Three groups sharing the same gap pattern point to the rule; the fourth group deviates from it; Check the FULL gap pattern, not just the first gap — a group can match on the first gap and still be the odd one out if its second gap is different; Once you've found the shared gap pattern from three groups, verify it explains all three completely before concluding the fourth is odd — this avoids locking onto a coincidental partial match; Gaps can run backward too (letters decreasing, like T, R, P with a −2, −2 pattern) — treat a negative gap the same way as a positive one; don't assume every group moves forward through the alphabet
Coding-Decoding: letter shifting	Identify the code type from the example first: letter-shift (compare first letters), mirror (A↔Z pairing), position-number (A=1…Z=26), or word-substitution (match the common word to the common code-word across two sentences). Re-derive the exact rule every time, never assume it carries over.
Coding-Decoding Solved Questions	Shift ciphers: every letter moves forward or backward by the same fixed number of places in the alphabet (e.g., CAT → DBU is a +1 shift on every letter); Mirror/reverse-alphabet codes: each letter is replaced by the letter the same distance from the OTHER end of the alphabet (A↔Z, B↔Y, C↔X, and so on); Numeric codes: each letter is replaced by its position number in the alphabet (A=1, B=2, … Z=26), or by some fixed arithmetic on that position; Word-substitution codes: whole words (not letters) are swapped for code-words, usually shown across two coded sentences that share a word — matching the repeated word to the repeated code cracks it; Some codes use a NON-uniform shift that depends on each letter's position in the word (e.g., 1st letter +1, 2nd letter +2, 3rd letter +3) rather than one constant amount — always check your guessed rule against EVERY letter of the given example before applying it, since a shift that looks constant for the first two letters can break on the third; A few questions reverse the order of the word's letters first and then apply a simple shift (the order you do these two steps in doesn't change the final result, since shifting is applied letter-by-letter regardless of position) — if a plain constant shift doesn't fit, check whether reversing the word first reveals one; After decoding, verify your answer by reversing your own rule on it — if that doesn't get you back to the original word or letter from the question, the rule you used was wrong
Coded Relationships Solved Questions	Decode one symbol at a time, converting each into a plain-language relationship ("P + Q" becomes "P is the mother of Q") before trying to combine them; Draw or mentally build a small family tree exactly like a plain-language Blood Relations question — the only difference here is that the relationships arrive in coded form; Track gender carefully: a relationship like "brother of" or "son of" tells you the first person's gender directly, which is often the key to naming the final relationship correctly (uncle vs aunt, nephew vs niece); Work through the chain in the order given, converting the full expression into a short family-tree sketch before naming the final relationship — don't try to jump straight to the answer; When the chain has three coded links instead of two, decode and sketch them one link at a time, updating the same family tree as you go — trying to hold all three relationships in your head at once is where mistakes happen
Direction Sense: plotting the path	Plot as coordinates: North=+y, East=+x. Right turn = 90° clockwise from current facing; left = 90° anticlockwise. Distance = $\sqrt{(x^2+y^2)}$. Only name an exact direction if the final point sits on one axis.

Direction Sense Solved Questions	Treat East-West as one axis and North-South as the other, like a graph. Facing North, a right turn points you East and a left turn points you West; A right turn rotates your facing direction 90° clockwise (N→E→S→W→N); a left turn rotates it 90° counter-clockwise (N→W→S→E→N). A U-turn reverses it completely; For "how far from the start" questions, add up the net distance travelled along each axis separately, then apply the Pythagorean theorem: shortest distance = $\sqrt{(\text{net east-west}^2 + \text{net north-south}^2)}$; For "which direction from the start" questions, the signs of the net east-west and net north-south displacement tell you directly which way to point — and if both are non-zero and equal, the answer is an intercardinal direction (e.g. North-East); Shadow-direction questions use the sun's position instead of turns: in the morning the sun is in the East, so shadows fall towards the West; in the evening the sun is in the West, so shadows fall towards the East. Once you know which way the shadow falls, and whether that's to the person's left or right, you can work out which way they're facing; "Distance from the start" always means the straight-line (beeline) distance, found from the NET displacement via the Pythagorean theorem — this is different from the total distance actually walked, which is just the sum of every individual leg of the path; If a question doesn't explicitly say the person starts facing North, don't assume it — read the very first stated direction and build every later turn from that
Series completion: finding the pattern	Check in order: constant difference (arithmetic) → differences-of-differences (quadratic) → constant ratio (geometric) → interleaved sub-sequences → Fibonacci-style sums. Verify the pattern against every given term, not just the first few.
Alphabet series: converting letters to positions	Convert letters to positions (A=1…Z=26), solve as a number series using the same pattern-finding techniques, convert back to a letter. Watch for wraparound past Z (subtract 26) or before A (add 26). In two-letter terms, verify each position's pattern independently.
Number Series Solved Questions	First check the simple difference between consecutive terms. If that’s constant, you have a plain arithmetic series; If the plain difference isn’t constant, check whether the DIFFERENCES themselves follow a pattern (e.g., 3, 5, 7, 9, …) — this catches series built from squares, cubes or similar formulas; If differences don’t help, check the ratio between consecutive terms (geometric series), or try splitting the series into its odd-position and even-position terms separately — many series are really two simpler series interleaved; Always check your guessed pattern against every given term, not just the first two or three — a pattern that fits the start can still break later in the sequence; Some series repeat a two-operation CYCLE rather than alternating between two fixed amounts on the raw numbers — e.g. "×2, then −3", over and over. If neither a constant difference nor a constant ratio fits, check whether consecutive PAIRS of steps repeat the same two operations; A few series are built from squares, cubes or prime numbers, sometimes with a constant added: if the gaps between terms grow in a clean, evenly-increasing way (like 2, 3, 4, 5, … apart), suspect a square-based series (since consecutive squares differ by consecutive odd numbers, offset by a constant doesn't change that pattern of growth); check cubes or the prime list directly if the terms look familiar
Alphabet Series Solved Questions	Convert every letter to its position number first (A=1, B=2, … Z=26). Solve the resulting number pattern exactly as you would for Number Series, then convert the final answer back to a letter; Common patterns: a fixed gap between letters (skip 1, skip 2…), an increasing or decreasing gap (mirroring Number Series’ "differences of differences"), two interleaved sequences running at once, or blocks of consecutive letters whose starting points follow their own pattern; Some series alternate forward and backward movement (e.g., +3 then −1, repeating) — treat this the same as an alternating-operations Number Series pattern, just in letter-position space; Watch for a position going past 26 or below 1 — in that case the series wraps around the alphabet (26 wraps to 1, or 1 wraps to 26), though this is relatively rare and worth double-checking for before assuming a pattern is broken; Write the position number above or beside each letter as you go, rather than tracking it mentally — this is the single biggest time-saver, especially past J (10) or T (20), where mental counting becomes unreliable under exam pressure

Wrong Number Series Solved Questions	Check the differences between consecutive terms first. If they form a recognisable pattern themselves (constant, or increasing by a fixed amount, or odd numbers), one term breaking that pattern is your answer; If differences don't reveal a pattern, check the ratio between consecutive terms — a geometric series (each term × a fixed number) is common, and a wrong term will show an inconsistent ratio; Check against a known formula family — squares (1, 4, 9, 16, 25, …), n^2 + a constant, or n(n+1) — since several standard series are built directly from one of these; Once you spot the pattern from the terms that DO fit, calculate what the odd-one-out term should have been, rather than just naming which position looks wrong — this confirms your pattern is actually correct; If neither a constant difference nor a constant ratio fits, check whether the DIFFERENCES themselves form a geometric pattern (doubling each time) — common in series built by repeatedly adding a growing amount
Alphanumeric Series Solved Questions	Split each term into its letter part and its number part, and track them as two separate sequences — don't try to find one pattern connecting both at once; Solve the letter sequence exactly like Alphabet Series: convert to position numbers (A=1, B=2, …) and find the gap between consecutive positions; Solve the number sequence exactly like Number Series: check the difference, the ratio, or a formula family (squares, n(n+1), doubling) between consecutive terms; Once you've found both patterns separately, apply each one once more to get the letter and the number of the missing term, then combine them into the final answer; The letter and number parts don't have to move in the same direction or at the same rate — one can increase while the other decreases, or one can use a fixed gap while the other multiplies; solve each strictly on its own evidence
Letter Pairs with Equal Alphabet Gap	For any two letters in the word, "letters between them in the word" = (their position gap in the word) − 1. For two letters three spots apart in the word, that's 2 letters between them; "Letters between them in the alphabet" = (the difference between their alphabet positions, A=1 … Z=26) − 1. For B and E, positions 2 and 5, that's 2 letters between them (C, D); Check every pair of letters in the word (not just adjacent ones), and count a pair when the word-gap equals the alphabet-gap; Work systematically: list each letter's position in the word and its alphabet position side by side first, then compare gaps pair by pair — trying to do this from memory invites errors; This rule only meaningfully applies to pairs of two DIFFERENT letters — if a word repeats the same letter, that letter paired with its other occurrence has no real "alphabet gap" to compare, so focus on pairs of distinct letter values
Syllogism: conclusions from statements	A conclusion follows only if true in EVERY valid diagram. "All" chains transfer directly; "Some" statements never guarantee overlap beyond what's stated. "No A are B" is symmetric with "No B are A". Every category named in the statements is assumed to have at least one member (SSC/IBPS convention), so "All A are B" also gives "Some B are A" — but never "All B are A".
Syllogism Solved Questions	Treat every statement as 100% true, no matter how odd it sounds ("All cats are dogs" is a valid statement for this question) — judge conclusions purely on logic, not on what you know about the real world; Four statement types matter: "All A are B", "No A are B", "Some A are B", and "Some A are not B"; "Some A are B" can always be flipped to "Some B are A" — this conversion is always valid. But "All A are B" can NOT be flipped to "All B are A" — that is a classic trap. "All A are B" can only be weakened to "Some B are A" (these questions assume A has at least one member); Sketch a quick Venn diagram for each conclusion and check whether it holds in every possible arrangement of the circles, not just the most obvious one. If you can draw even one valid arrangement where the conclusion is false, it does not follow; The "either/or" special case: if two conclusions are exact complements of each other (one says "No X are Y", the other says "Some X are Y" — between them, they cover every possibility, since the X-Y overlap is either zero or not), and NEITHER follows on its own, check whether at least one of them must still be true. If so, the answer is "Either conclusion I or II follows," even though neither follows individually; With three statements chained together, work out what the first two combine to tell you, and only then bring in the third — don't try to combine all three at once. A chain of "All...All..." stays strong all the way through, but a "Some" anywhere in the chain usually breaks it: the "some" overlap isn't guaranteed to land inside the earlier subset relationship

Syllogism: Possibility Cases	A possibility conclusion ("it is possible that...") is valid if you can draw even ONE diagram consistent with the statements where it holds — it does not need to hold in every diagram, unlike a regular "definitely follows" conclusion; A possibility conclusion is NOT valid only when it's impossible in every single diagram consistent with the statements — meaning the statements actively rule it out, not just fail to guarantee it; Two "Some" statements, or a "Some" combined with another statement, usually leave real freedom in how the circles overlap — this is where both a positive and a negative possibility often turn out valid at once; When one category is fully nested inside another that's fully separate from a third (an "All" chained into a "No"), the nested category and the separate one can never overlap in any diagram — ruling out any possibility conclusion that requires them to; When two categories have NO statement linking them directly or transitively, their relationship is completely unconstrained — in that case, both "some X are Y" and "no X are Y" are typically valid possibilities at once, since nothing in the statements rules either one out
Venn Diagram: inclusion-exclusion	Two sets: $\|A \text{ or } B\| = \|A\|+\|B\|-\|A \cap B\|$. Three sets: add the triple-overlap back once after subtracting all three pairwise overlaps. "Only A" and "exactly two" both need the triple-overlap removed from the relevant pairwise terms. Sanity check: no negative counts, "at least one" ≤ total.
Venn Diagram Solved Questions	If some people belong to group A, some to group B, and some to BOTH, the number who belong to A or B is A + B – (both) — not simply A + B, which double-counts the overlap; To find how many belong to EXACTLY one group (not both), subtract the "both" count from each group's total: only A = A – both, only B = B – both; For three overlapping groups, every pairwise "both" count given usually includes people in all three — the formula is: total in at least one = $A + B + C - (A \cap B) - (B \cap C) - (A \cap C) + (A \cap B \cap C)$, adding the all-three group back once since it got subtracted three times in the pairwise terms; "Neither" (people in none of the groups) = Total people – (number in at least one group); To find how many belong to EXACTLY TWO of three groups (not all three), subtract three times the triple-overlap from the sum of the pairwise overlaps: exactly-two = $(A \cap B + B \cap C + A \cap C) - 3 \times (A \cap B \cap C)$ — each triple-overlap person is counted in all three pairwise terms, so it must come out three times, not once
Set Theory Solved Questions	For two sets: $\|A \cup B\| = \|A\| + \|B\| - \|A \cap B\|$ — adding the two group sizes directly double-counts whoever is in both, so the overlap is subtracted back out once; "At least one" means the union, $\|A \cup B\|$. "Neither" means everyone outside the union: Total – $\|A \cup B\|$; "Only A" (in A but not B) = $\|A\| - \|A \cap B\|$. "Exactly one of A or B" = $\|A \cup B\| - \|A \cap B\|$ (the union, minus whoever is in both); Draw two overlapping circles and fill in the overlap number first — the "only A" and "only B" regions are then whatever's left in each circle after removing the overlap; For three sets, the formula extends (inclusion-exclusion): $\|A \cup B \cup C\| = \|A\|+\|B\|+\|C\| - \|A \cap B\| - \|B \cap C\| - \|A \cap C\| + \|A \cap B \cap C\|$. Each pairwise overlap gets subtracted once, but the people in all three groups get removed three times by those subtractions, so the "all three" count is added back once to correct for that; "Exactly two" of three groups = (sum of the three pairwise intersections) – 3 × (all three) — each pairwise intersection includes the "all three" people, so subtracting 3 times that count removes them from each of the three pairwise totals; For a three-circle Venn diagram, fill in the centre (all three) first, then each pairwise-only region, then each single-group-only region — working from the most overlapped region outward avoids double-counting
Calendar: counting odd days	Odd days: normal year = 1, leap year = 2. Leap year rule: divisible by 4, but century years (ending 00) need divisibility by 400. Shift the reference weekday forward by (days gap mod 7) for a later date, or backward for an earlier date. A gap that's a multiple of 7 always lands on the same weekday.

Calendar (Day of the Week)	A normal year has 365 days = 52 weeks + 1 extra day, so it contributes 1 "odd day". A leap year has 366 days, contributing 2 odd days; A year is a leap year if it's divisible by 4 — EXCEPT a century year (ending in 00), which is a leap year only if it's also divisible by 400. (So 2000 was a leap year, but 1900 was not — this century exception is the most commonly tested trap.); To find the day of the week for a target date given a known reference date: count the number of days between them, find the remainder when divided by 7 (the odd days), then shift the reference day forward by that many days; For same-date, different-year questions, you can skip counting individual days — just add up one odd day per normal year and two per leap year between the two dates; When counting the day-gap across multiple months, use each month's ACTUAL length (30, 31, or 28/29 for February) — forgetting that February has 29 days in a leap year is a common source of a one-day error; For a gap spanning several years that aren't a simple "same date" comparison, just add up each year's odd-day contribution one year at a time (1 for a normal year, 2 for a leap year) rather than looking for a shortcut — this always works and avoids relying on a half-remembered rule of thumb
Clock: the angle between the hands	Hour hand: 30H + 0.5M degrees. Minute hand: 6M degrees. Angle = |difference|, take the smaller of it and 360 minus it. Hands coincide 11 times, are opposite 11 times, and are at right angles 22 times, every 12 hours. Watch for the 5-6 o'clock boundary case for "opposite."
Clock (Angle Between Hands)	The minute hand completes 360° in 60 minutes, so it moves 6° every minute. The hour hand completes 360° in 12 hours (720 minutes), so it moves 0.5° every minute — it creeps forward steadily, not staying fixed at the hour mark; At M minutes past H o'clock: minute-hand angle (from 12) = 6 × M degrees. Hour-hand angle (from 12) = 30 × H + 0.5 × M degrees; Angle between the hands = the absolute difference between those two angles. If that difference is more than 180°, subtract it from 360° — "the angle between the hands" always means the smaller of the two possible angles; For "when are the hands opposite" (180° apart) or "when do they overlap" (0° apart) questions within a given hour, set up the equation using the formulas above and solve for M directly, rather than trying to picture it; "When do the hands coincide" uses the exact same setup as "opposite," just solving minute-angle = hour-angle (difference of 0) instead of a difference of 180; "When are the hands at right angles" (90° apart) usually has TWO valid moments within most hours — once while the hour hand is still ahead by 90°, and once after the faster minute hand has gained all the way past it to be 90° ahead instead. Check both cases (hour-angle − minute-angle = 90, and minute-angle − hour-angle = 90) if the question doesn't specify which one it wants; Mirror-image clock questions use a fixed rule: if a clock's reflection in a (vertical) mirror shows a certain time, the real time = 11:60 minus the mirror-shown time (11:60 is just a convenient way to write 12:00 that avoids borrowing when subtracting the minutes)
Cubes and Dice Solved Questions	The core rule: on a standard die, numbers on opposite faces always sum to 7 (1↔6, 2↔5, 3↔4); To find a face opposite a given number, subtract it from 7; The six faces of one die always sum to 1+2+3+4+5+6 = 21 — a fast way to find the total of several hidden faces is "21 minus whatever's visible," instead of adding up each hidden face individually; When two dice are joined face-to-face, the two touching faces are both hidden — find their sum, then subtract it from the combined total (42 for two dice) to get everything visible on the outside; Scope of the seven rule: use it only when a standard die is specified. An arbitrary numbered cube can have a different arrangement; infer its opposites from the views or net instead; A cube has six faces. Each face has four neighbours and one opposite. Faces seen together at a corner are adjacent, never opposite. If four neighbours of a face are known, the remaining label must be opposite; For a net, fold mentally around a chosen base. Do not assume that squares separated on the flat sheet are opposite after folding. In a strip A–B–C–D with E above B and F below B, opposite pairs are A/C, B/D and E/F; For a cube painted on all six outer faces and cut into n × n × n equal cubes (n ≥ 2): three painted faces = 8 corners; exactly two = 12(n − 2); exactly one = 6(n − 2)²; none = (n − 2)³; These counts assume every outer face was painted before cutting. For n = 1 there is just one cube with six painted faces; do not use the corner formula. For partial painting, count the affected faces and edges separately; Check the count: all categories must add up to n³. A corner belongs to three faces, so counting each face independently would count it three times

Data Sufficiency Solved Questions	These questions give a question plus two numbered Statements, and ask whether the statements provide ENOUGH information to answer it — you're judging sufficiency, not computing the final answer; Standard answer choices: Statement I alone is sufficient (but not II); Statement II alone is sufficient (but not I); both together are needed (neither alone works); either statement alone is sufficient; or even both together are not sufficient; Evaluate each statement completely independently first, as if the other didn't exist — mixing information from both before checking each one alone is the most common mistake here; "Sufficient" means you could, in principle, pin down a single definite answer — it doesn't mean you have to finish the arithmetic. If a statement sets up a valid equation or relationship with exactly one solution, it's sufficient even without computing the final number; A statement that merely restates general background knowledge, or a special case of information already implied by the question itself, adds nothing new — don't mistake a statement sounding informative for it actually narrowing down the answer
Inequality: chains and counterexamples	A chain combines validly only if every link points the same direction; a direction reversal breaks the connection between the endpoints. Strict (>) implies weak (≥), never the reverse. To disprove a conclusion, find two valid assignments giving opposite results — or one where the two sides are exactly equal.
Inequality (Coded Inequality)	Some questions use coded symbols (like @, #, $) in place of >, <, =, ≥, ≤ — always check the legend given at the start of the question before solving anything; A chain like A > B ≥ C only gives a definite conclusion about the endpoints (A and C) if every link points the SAME direction. A > B ≥ C combines to A > C; a chain that reverses direction partway (like A > B < C) gives no definite relationship between A and C at all; When a strict relation (>) is proven between two letters, the non-strict version (≥) is also considered to follow, since "greater than" always implies "greater than or equal to". The reverse isn't true: proving only ≥ does not let you conclude the strict >; When you suspect no definite relationship can be proven, try to find two different valid number assignments that satisfy all the statements but give opposite results for the conclusion — if you can, neither conclusion follows. If you can even make the two letters exactly equal in a valid assignment, that rules out both "greater than" and "less than" as safe conclusions; The "either/or" special case: if the derived relationship between two letters is a non-strict one (A ≥ C, with no way to pin down whether it's strictly > or exactly =), then the pair of conclusions "A > C" and "A = C" together follow as "either I or II" — because ≥ by definition means one of those two must be true, even though neither alone is guaranteed; A chain can mix >, <, ≥, ≤ and = freely — as long as there is at least ONE strict link (> or <) anywhere in an otherwise-consistent-direction chain, the overall endpoint relationship comes out strict too, not just ≥ or ≤
Input-Output Solved Questions	The machine's rule is fixed and usually stated (or shown through a solved example) — your job is to apply it exactly, step by step, not to guess a shortcut; Work one step at a time. Write out the full arrangement after each step before moving to the next — trying to jump straight to the final step in your head is where mistakes creep in; Count positions carefully, left to right, within the group the question asks about (e.g. "3rd number" means 3rd among the numbers only, not 3rd overall); In this lesson's machine: Step I moves all the words to the front, sorted in reverse-alphabetical order, while the numbers keep their original relative order unchanged, following behind. Step II (final) then sorts those numbers into descending order; the words stay exactly as Step I left them; If a question gives a different input but says it uses the "same machine" or "same rule," re-derive the whole arrangement from scratch using the stated rule — don't try to pattern-match against an earlier input's specific answer, since the actual words and numbers will differ

Mathematical Operations Solved Questions	First, rewrite the whole expression substituting every symbol with its NEW meaning — do this as one clean pass before calculating anything, so you don't re-read the swapped meaning mid-calculation and make an error; Once substituted, solve using the normal order of operations: multiplication and division first (left to right), then addition and subtraction (left to right) — exactly like Simplification/BODMAS; Multiplication and division rank equally with each other, and addition and subtraction rank equally with each other — neither one in a pair automatically goes before the other; Double-check your substitution against the key once more before calculating — mixing up which symbol maps to which is the single most common mistake here, not the arithmetic itself; When a question has several multiplication/division symbols spread through the expression (not just one adjacent pair), resolve ALL of them left to right across the whole expression first, before touching any addition or subtraction — don't stop after the first × or ÷ you see
Floor-Based Puzzle Solved Questions	People or objects are assigned to floors of a building, numbered from bottom to top (always confirm which direction floor 1 is, since it's occasionally numbered the other way); The same clue types as Seating Arrangement apply: "immediately above/below" is exact; "somewhere above/below" only gives a direction, not an exact gap, unless a count is given ("exactly 2 floors above"); Start with whichever clue fixes an exact floor number first, before clues that only describe relationships between people; A common trap: "more than X floors above" gives a RANGE of possibilities, not a single answer, until another clue narrows it down. After placing everything the clues force directly, whatever floor or person is left has only one place to go; If a puzzle says one floor is left vacant (unoccupied), that floor still counts as a numbered floor in the building — it just has no person assigned to it. Don't renumber the remaining floors to skip it
Scheduling Puzzle Solved Questions	Start with the most absolute clue (a fixed day, like "X visited on Friday") and place it first — relative clues are far easier to apply once you have one fixed anchor point; Apply "immediately before/after" clues next, since they fix a relationship between two specific slots rather than leaving multiple possibilities open; When a clue only narrows things down to a couple of options, write both down and keep applying the remaining clues to the SAME diagram — don't restart from scratch each time; Fill in the remaining people/days last, using elimination once enough slots are fixed — the final arrangement should satisfy every clue simultaneously, not just the one you used to place each entry; A negative clue ("X did NOT visit on Tuesday") usually only rules out one option rather than fixing a position by itself — save it for the end, to break a tie between the last two or three possibilities left after the positive clues are applied
Comparison Puzzle Solved Questions	Convert every comparison clue into a "greater than" chain using one consistent symbol as you read: "X is taller than Y" becomes X > Y; Combine chains that share a common person: if you know C > A and A > B, you can merge them into C > A > B without needing a separate clue connecting C and B directly; A clue giving an extreme ("D is the tallest") anchors one end of the whole chain — place it first, the same way an exact position anchors a Seating Arrangement; Once every person appears in one single merged chain, answering "who is taller than X" or "how many people are shorter than Y" is just reading positions off that chain; If two comparison chains don't share any common person, they can't be merged into one ordering — in that case, a question comparing someone from one chain to someone in the other genuinely "cannot be determined" unless another clue links them
Scheduling Puzzle: Month & Date	Keep two separate tracks — one for months, one for dates — and sort each clue into the track it actually constrains before trying to place anyone; Resolve the month track first if enough direct clues exist to fully fix it — a completely solved month track often turns an indirect date clue ("the person in January...") into a direct one instantly; A clue like "the person born in March" only becomes usable once you know who that is — revisit indirect clues after finishing the track they depend on, rather than trying to use them immediately; Fill in whatever is forced directly first in both tracks; the single remaining option in each track is then fixed by elimination, exactly as in a one-attribute Scheduling Puzzle; Once both tracks are solved, questions can mix the two attributes freely ("who is immediately after X by month" or "how many people come before Y by date") — answer these by reading positions off whichever single track the question actually asks about

Matrix Puzzle Solved Questions	Draw two grids (or one combined table): people down the side, cities across the top, professions across the top again — mark a clue with a tick (confirmed) or a cross (ruled out) in the matching cell as soon as you read it; A clue naming a person directly ("X lives in Delhi") fills a cell immediately. A clue linking two attributes ("the Doctor lives in Delhi") only fills a cell once you also know which person holds one of those two attributes; Work the direct clues first, then use elimination — once a person has one city ruled out, then another, then another, the last city left is confirmed, even without a clue stating it directly; Finish every grid with a count: four people, four cities, four professions — each used exactly once. If a city or profession is left unassigned at the end, a clue was misread; Treat both grids as connected, not separate puzzles — fixing one person's city often rules out an option in the profession grid for a different person (via a clue linking the two), so re-scan both grids after every new fact rather than solving one grid fully before touching the other
Floor and Flat Puzzle Solved Questions	Draw a grid: floors going up one axis, flats (Left/Right, or however many are given) going across the other — every person needs exactly one floor-and-flat cell, and every cell needs exactly one person; "Directly above/below" usually means the SAME flat position, one floor up or down — not just anywhere on the floor above. Check the question's own wording if it says otherwise; Work the clues that fix both floor AND flat first (the most restrictive). A clue that only rules something out ("not on floor 2 or 3") becomes useful once it leaves just one open cell; An edge case is often the key: if someone must be "directly above" another person who could be on the top floor, that's impossible — there's nothing above the top floor — so that placement gets ruled out immediately; A clue saying two people live "on the same floor" fixes only the floor they share, not which flat each takes — don't assume they're also on the same side unless the clue explicitly says so
Ranking and Order Solved Questions	The key formula: if a person's rank from the top is T and their rank from the bottom is B, in a group of N people total, then T + B = N + 1. Given any two of T, B, N, this gives you the third; "Rank from the top" and "rank from the start" usually mean the same thing — but check the wording carefully, since "top" can mean different things depending on whether the ranking is by marks, height, or finishing order; For relative-position clues ("A is 3 ranks above B", "there are 5 people between X and Y"), convert each clue into a number line of positions, the same way as Seating Arrangement, and resolve step by step; "Above" in rank means a BETTER (smaller/earlier) position number — being 5 ranks above someone ranked 20th means being ranked 15th, not 25th; A common mistake with "people between" clues: if there are exactly K people between X and Y, their position numbers differ by K + 1, not K — the gap counts the people in between, not the distance between the two positions themselves
Seating Arrangement: filling the row	Fix absolute clues first, then relative ones. Default facing is North (left/right matches the diagram); South flips a person's own left/right; apply that flip only to perspective clues, never to "extreme end" clues. Circular: facing center, own-right = counter-clockwise as drawn.
Seating Arrangement Solved Questions	Start with whichever clue is most restrictive — one that fixes an exact position, like "sits at the extreme left end" — before clues that only describe relationships between people; "Immediately to the right/left of X" is exact (one specific seat, one specific side). "Between X and Y" means adjacent to both — but check whether another clue is needed to tell you the order (X then Y, or Y then X); Unless stated otherwise, assume everyone faces North. If a question says everyone faces South, each person's own right and left are reversed relative to how the row is drawn left-to-right — this reversal is the single most common trap in this topic; After placing everything the clues force directly, whatever position or person is left over has only one place left to go — fill that in last, by elimination; If someone is given as "nth from the left end" AND "mth from the right end" of the same row, the total number of people in the row = n + m − 1 (the two counts both include that one person, so adding them double-counts them once); Negative clues ("X does not sit at either end," "X is not adjacent to Y") don't fix a position by themselves — use them only to rule out specific slots once the positive clues have already narrowed things down to a couple of possibilities

Double Row Seating Solved Questions	Draw two parallel rows of blank slots. Unless stated otherwise, the person in a given position in one row faces the person in the SAME position (counted from the same side) in the other row; Place the most restrictive clues first — an exact end position ("sits at the extreme left of Row 1") — exactly as in single-row Seating Arrangement; A "faces" clue links one slot in Row 1 directly to one slot in Row 2 — use it to transfer information you've already fixed in one row across to the other; Fill in whatever is forced directly by the clues first; the last remaining person for the last remaining slot in each row is then fixed by elimination; Always read the specific facing rule the puzzle gives rather than assuming same-position facing by default — some puzzles explicitly reverse it (position 1 in Row 1 facing the LAST position in Row 2 instead)
Circular Seating Arrangement	There's no "extreme left" or "extreme right" on a circle — every clue describes a position relative to someone else (immediately left/right of X, opposite X), never an absolute seat number; When everyone faces the CENTER, a seated person's own right hand points in the counter-clockwise direction as seen from above — the opposite of what a top-down map suggests. (If everyone faced outward instead, right would match clockwise.); "Opposite" only has a single, unambiguous seat when the total number of people is even — directly across the circle. With an odd number of people, no seat is exactly opposite another, so well-posed questions avoid relying on it; Fix one person's seat as a reference point (position doesn't matter which, since the whole arrangement can be rotated), then place everyone else by their stated relationship to that person or to each other
Mixed-Direction Seating Arrangement	Always separate "physical" position (the row as drawn, left to right on the page) from a person's "own" right/left — the two only match when that person faces North (the usual default); When a person faces South, their own right and left are reversed relative to the row as drawn: their own right points to the physical LEFT, and their own left points to the physical RIGHT; A clue like "the extreme left end" or "third from the left" is always about the physical row, never about anyone's own perspective — only "immediately to X's right/left" depends on which way X faces; Check every person's facing direction before answering a perspective-based question — reading "right" as the physical right when the person actually faces South is the single most common mistake in this topic; When several people face South, apply the left-right reversal to EACH of them individually based on their own facing direction — don't assume the whole row's perspective flips together just because more than one person faces South
Statement and Assumption Solved Questions	Test each candidate assumption by asking: "if this were FALSE, would the statement still make sense?" If the statement falls apart or becomes pointless without it, it IS a necessary assumption. If the statement still works fine without it, it is NOT; Don't confuse an assumption with the stated content itself (what the speaker directly said) or with a conclusion drawn from the statement — an assumption is specifically something unstated that the statement silently depends on; Notices, signs and advertisements almost always assume there's a reason for issuing them — that at least some people might otherwise do the opposite, or that some people would be interested. They do NOT usually assume guaranteed universal compliance or interest; A request or question usually assumes the listener is capable of fulfilling it, or likely to know the answer — that's why that specific request was made to that specific person; A policy or decision statement ("the government/company/school should/has decided to do X") assumes that X is at least feasible to carry out — it does not automatically assume X will work perfectly or that everyone affected will respond in a particular way

Statement and Conclusion Solved Questions	Unlike Syllogism (general class relationships like "All A are B") or Statement and Assumption (unstated premises), Statement and Conclusion gives factual statements and asks which conclusions follow directly from them alone; A conclusion follows only if it's a direct, inevitable restatement or combination of what the statement already says — not something merely probable, common-sense, or requiring outside information; Be suspicious of conclusions that go beyond the statement's scope — adding a cause, a comparison, or a generalisation the statement itself never made is the most common trap. The statement saying X happened doesn't mean it said X happened BECAUSE of Y; When multiple statements are given together, check whether the conclusion validly combines them (like chaining two comparisons) rather than assuming a connection the statements never actually established; An "either...or" statement logically guarantees that if one of the two named things is ruled out, the other must hold — but it does NOT guarantee both happen together, unless the statement explicitly says so
Course of Action Solved Questions	A valid course of action must be practical (actually implementable, not vague), directly related to the stated problem (not a tangent), and reasonable given only the information in the statement — not something requiring facts that aren't stated; A course of action framed as "ban/shut down/eliminate X entirely" is often too extreme to be the best response, unless the statement specifically supports something that drastic — moderate, targeted actions are usually favoured over sweeping ones; Don't confuse a course of action with a conclusion (which describes what IS or WILL happen) or an assumption (something taken for granted) — a course of action is specifically about what SHOULD BE DONE in response; When a proposed action's scale is wildly out of proportion to the scale of the problem described (a permanent ban over a minor, fixable issue), that mismatch is usually the clearest sign it doesn't follow; An action that only manages the symptom (like a warning or a temporary fix) rather than removing the root cause can still follow, as long as it's a reasonable, proportionate response to exactly what the statement describes — the test is proportion and relevance, not whether it's the most thorough possible fix
Statement and Argument Solved Questions	A strong argument must be both relevant to the question and important/weighty — a real, practical consequence or reason, not a passing preference or a superficial point; An argument that states a general truism, a vague preference ("people like X"), or a throwaway comparison to something unrelated is weak, even if it isn't factually wrong; An argument that doesn't actually address the specific question asked — or answers a different, broader question — is weak, however reasonable it sounds standing alone; Judge "yes" and "no" arguments independently of each other — a question can have a strong case on both sides, on neither side, or on only one; An argument built on a vague, unspecified fear ("it could be misused," "something might go wrong") is weak unless it explains specifically how or why that risk is likely — a specific, named consequence is strong; a generic worry is not
Cause and Effect Solved Questions	If statement II describes something that would naturally and directly result from statement I, then I is the cause and II is the effect; If the direction is reversed — I is the kind of thing that would naturally result from II — then II is the cause and I is the effect; If both statements describe similar, simultaneous outcomes (like two unrelated institutions closing on the same days) that are too similar to be coincidence but neither directly causes the other, they're likely both effects of some common, unstated cause; If the two statements describe genuinely separate, unrelated events with no plausible causal link either way and no obvious shared trigger, they're independent of each other; The ORDER the statements are given in doesn't decide which is the cause — a statement describing the effect is sometimes listed first. Always judge the direction by which event could plausibly produce the other, not by which one appears as "I"

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