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PREVIOUS YEAR PAPER • FULLY SOLVED

IPMAT Indore 2026

The complete question paper with step-by-step solutions, topic and difficulty tagging for every question, official cut-offs and revision notes.

90	360	120	3
QUESTIONS	MARKS	MINUTES	SECTIONS

Reading it is step one. **Attempting it is what moves the score.**

Attempt this paper on the exam interface →

or create a free login and start practising →

HOW TO USE THIS PAPER

Don't read it. Attempt it.

A solved paper is only worth what you do with it. Here is the order that actually builds a score — and what is in this PDF to support each step.

1. **Attempt first, in one sitting.** 40 minutes per section, no pausing, no looking ahead. Mark every question you guessed.
2. **Then check, question by question.** Every question here carries its area, topic and a difficulty rating out of 10 — so a wrong answer points at a topic, not just a mistake.
3. **Read the solution even when you were right.** The step-by-step method matters more than the answer; a lucky guess at difficulty 7 is a gap you have not found yet.
4. **Convert the gaps into practice.** List the topics you lost marks in, then take a short timed test on each one until the accuracy holds.

Question text, numbering, option order and answer key follow the official paper. Every solution and shortcut below is worked from first principles, and every answer was computed independently before being checked against the official key.

90

Every question solved

Full working for all 90 questions, not just an answer key.

T

Topic tagged

Area, topic and sub-topic on every question, so gaps are nameable.

Difficulty rated

A 1–10 rating per question — know what was fair to skip.

Cut-offs & notes

Official sectional cut-offs plus end-of-paper revision notes.

BEFORE YOU TURN THE PAGE

Attempt this exact paper, scored and ranked

The same paper is live on Scorebuddy as three sectional tests and one full test, on the real exam interface — with instant scoring and a question-wise analysis once you submit.

Open the paper →

Create a free login

THE PAPER

Pattern & cut-offs

IIM Indore · 4 May 2026 · 90 questions · 360 marks · 120 minutes

Exam pattern

Section	Questions	Type	Correct	Wrong	Time
Quantitative Ability — Short Answer	15	TITA	+4	0	40 min
Quantitative Ability — MCQ	30	MCQ (incl. a 5-question DI set)	+4	−1	40 min
Verbal Ability	45	MCQ (+ 5 TITA para jumbles)	+4	−1 / 0	40 min
Total	**90**		**360 marks**		**120 min**

Sections are **separately timed** — 40 minutes each, with no returning to a section once its time is over.

Cut-offs, category-wise

Minimum sectional marks, IPMAT Indore 2026. All three must be cleared, however high the total.

Category	QA (SA) /60	QA (MCQ) /120	VARC /180	Overall /360
General	28	27	111	166
EWS	16	17	79	112

Read this before quoting the numbers. The General and EWS rows above are the only ones two independent sources agree on. For NC-OBC, SC, ST and PwD the published figures differ between sources, so they are deliberately left out rather than printed with false confidence — check iimidr.ac.in for those. One widely reported figure for scale: of 17,916 candidates with a positive score, **838** cleared all three sectional cut-offs.

For reference, the 2025 General cut-offs were 24 / 28 / 112, so the 2026 bar moved up slightly in QA (SA) and down slightly in QA (MCQ) and VARC.

🧭 Cut-offs, seat counts, fees and deadlines for every UG management exam, in one place. UG Guide

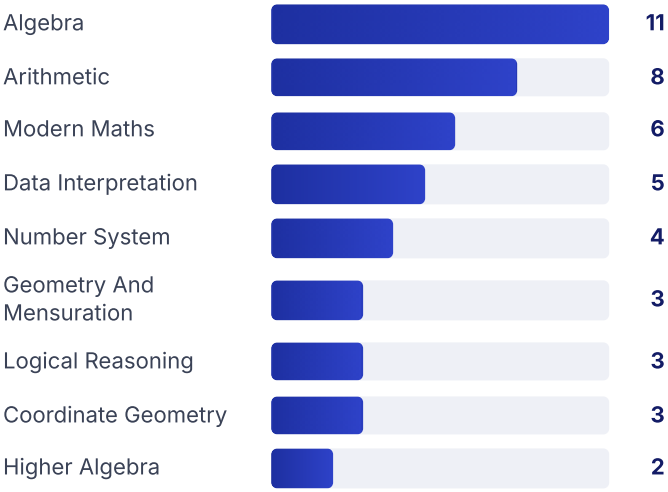
PAPER ANALYSIS

What IPMAT Indore 2026 actually asked

Every question in this PDF is tagged by area, topic and difficulty. Put together, the paper looks like this — and it is a fair map of what to prepare for.

40	5	45	5.8
QUANTITATIVE ABILITY	DATA INTERPRETATION	VERBAL & RC	AVERAGE DIFFICULTY / 10

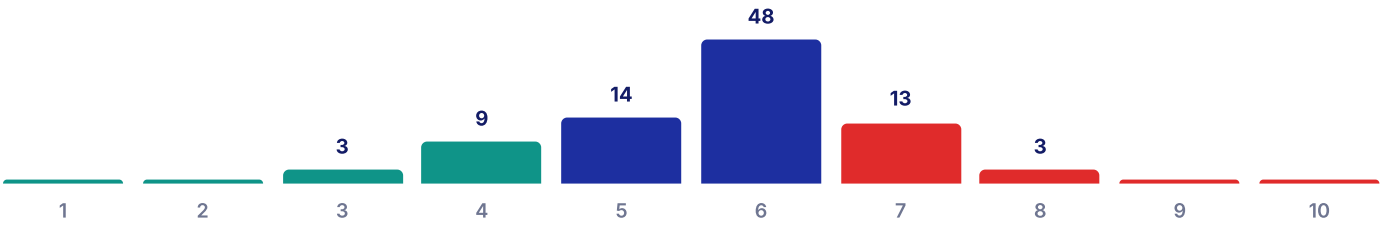
Quant & DI — where the marks sat



Verbal — where the marks sat



Difficulty spread across all 90 questions



Most of the paper sits at 5–7 out of 10. The paper is not won on the hardest questions — it is won by not dropping the ones rated 4 and below.

YOUR NEXT STEP

Turn this analysis into a study plan

Pick the topics that carry the most marks above, take a short timed test on each, and work down the list. Topic tests are built for exactly this.

Topic-wise tests →

Talk to a mentor

SECTION 1

QA-SA

Quantitative Ability — Short Answer

15	60	40 min	+4 / 0
QUESTIONS	MARKS	SECTIONAL LIMIT	MARKING

TITA

MOST ASKED HERE: Arithmetic **5** · Algebra **3** · Logical Reasoning **3** · Geometry And Mensuration **1** · Number System **1**

1 QA · GEOMETRY AND MENSURATION · QUADRILATERALS

5 /10

Let ABCD be a cyclic quadrilateral with AB = 15, BC = 20, CD = 24 and AC = 25. Then AD equals_____

ANSWER 7

SOLUTION

Step 1 — look at triangle ABC first. We know all three of its sides: $AB = 15$, $BC = 20$, $AC = 25$. Check whether they form a right triangle:

$15^2 + 20^2 = 225 + 400 = 625 = 25^2$

They do, so $\angle ABC = 90^\circ$, with AC as the hypotenuse.

Step 2 — use the cyclic property. In a cyclic quadrilateral, opposite angles add to 180°:

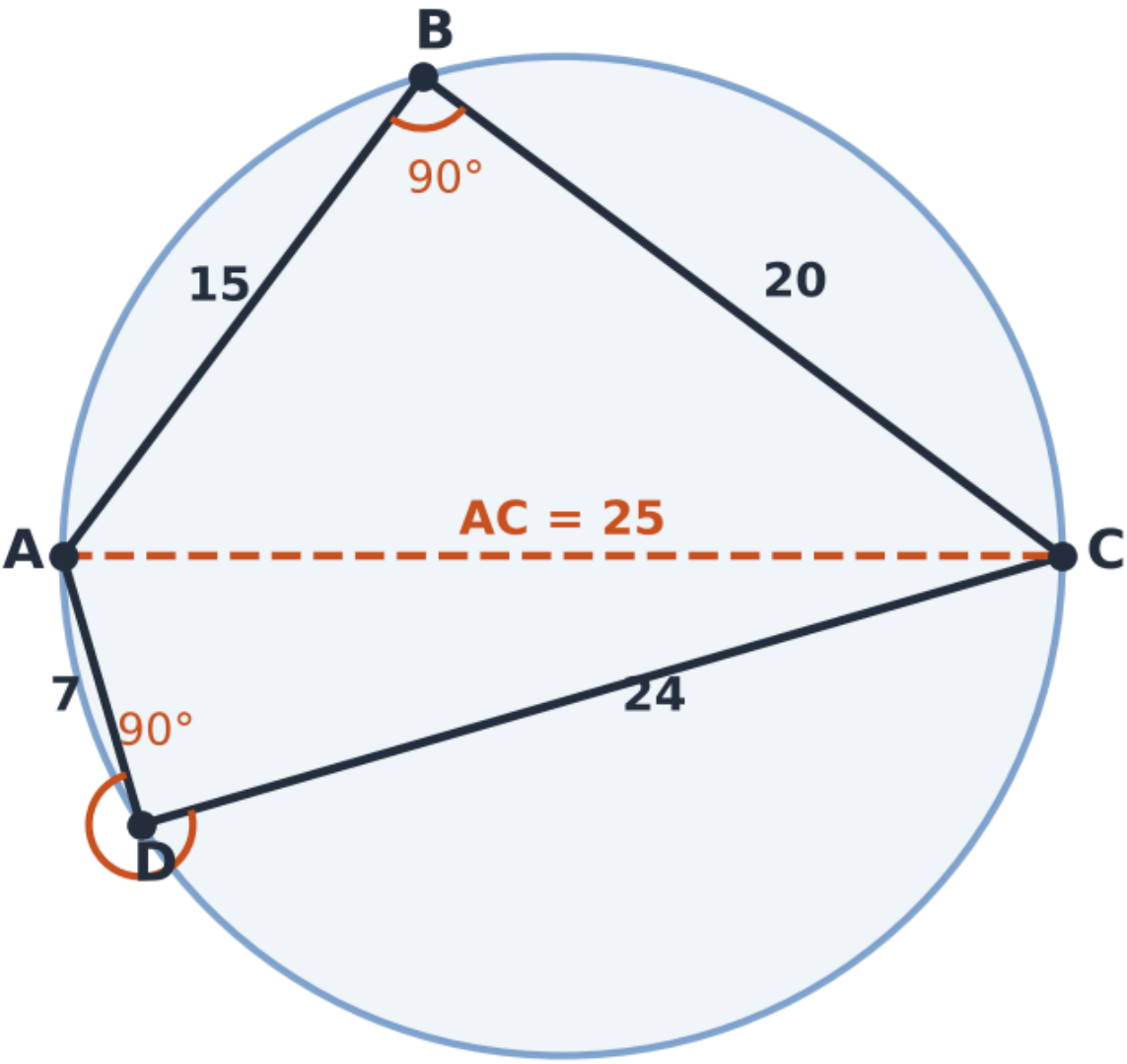
$\angle ADC = 180^\circ - \angle ABC = 180^\circ - 90^\circ = 90^\circ$

Step 3 — now triangle ADC is right-angled at D, with the same hypotenuse $AC = 25$:

$AD^2 + CD^2 = AC^2 \Rightarrow AD^2 = 625 - 24^2 = 625 - 576 = 49$

$AD = 7$

Notice 7–24–25 is the second Pythagorean triple hiding in this problem.



Answer: 7

Shortcut

Spot the triples. 15–20–25 is $5 \times (3, 4, 5)$, so $\angle B = 90^\circ$; the cyclic property instantly makes $\angle D = 90^\circ$; and 24–25 demands the 7–24–25 triple. **Answer in about ten seconds, with no algebra at all.**

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2 QA ARITHMETIC TIME SPEED AND DISTANCE ●●●○○○○○○○ 3 /10

A man starts walking from point A to point B at 4 km/hr. After 30 minutes, a woman starts from point A at 6 km/hr. If the woman reaches point B 20 minutes earlier than the man, then the distance between A and B in km is _____

ANSWER 10

SOLUTION

Step 1 — express both times. Let the distance be d km.

$$\text{Man's time} = \frac{d}{4} \text{ hours}, \qquad \text{Woman's time} = \frac{d}{6} \text{ hours}$$

Step 2 — work out the total time gap. The woman *starts* 30 minutes later **and** *finishes* 20 minutes earlier, so her journey is shorter by

$$30 + 20 = 50 \text{ minutes} = \frac{5}{6} \text{ hours}$$

Step 3 — form the equation.

$$\frac{d}{4} - \frac{d}{6} = \frac{5}{6}$$

Step 4 — solve. The left side is $d\left(\frac{3-2}{12}\right) = \frac{d}{12}$:

$$\frac{d}{12} = \frac{5}{6} \Rightarrow d = 10$$

Check: man takes $10/4 = 2.5$ h $= 150$ min; woman takes $10/6 \approx 100$ min but starts 30 min later, finishing at 130 min — exactly 20 min before him. ✓

Answer: 10

Shortcut

The only real trap is the time gap: it is $30 + 20 = 50$ minutes, not 20 and not 10. Once you see that, $\frac{d}{4} - \frac{d}{6} = \frac{d}{12}$ makes the arithmetic a single step.

---

3 QA ALGEBRA QUADRATIC EQUATIONS ●●●●●●○○○○ 6 /10

If x, y are real numbers and equations $x^2 - 12x + 35 = 0$ and $x^2 + ax + 105 = 0$ have at least one common root, then the minimum possible value of $y^2 + 4y - 5a$ is

ANSWER **106**

SOLUTION

Step 1 — factor the first equation.

$x^2 - 12x + 35 = (x-5)(x-7) = 0 \Rightarrow x = 5 \text{ or } 7$

Step 2 — the common root must be one of these. Substitute each into the second equation.

If $x = 5$: $25 + 5a + 105 = 0 \Rightarrow 5a = -130 \Rightarrow a = -26$

If $x = 7$: $49 + 7a + 105 = 0 \Rightarrow 7a = -154 \Rightarrow a = -22$

Step 3 — minimise the y part. Complete the square:

$y^2 + 4y = (y+2)^2 - 4 \geq -4$

so the smallest value of $y^2 + 4y$ is -4, at $y = -2$.

Step 4 — combine. The expression is $y^2 + 4y - 5a$, minimised as $-4 - 5a$:

- $a = -26$: $-4 + 130 = 126$
- $a = -22$: $-4 + 110 = 106$

The question asks for the **minimum possible** value over everything allowed, so take the smaller:

106

Answer: 106

Shortcut

Two separate minimisations, done independently: the y part bottoms out at -4 regardless of a, and then you simply pick whichever a makes $-5a$ smaller. Since a is negative, $-5a$ is positive, so you want the a **closer to zero** — that is -22.

---

4 QA ARITHMETIC PROFIT AND LOSS ●●●●●○○○○○ 5 /10

Ram purchased 3 oranges at Rs. 20 each and 5 mangoes at Rs. 38 each and then sold them by offering discounts of 25% and 20% on the fixed marked prices of oranges and mangoes, respectively. If he earned a profit of 50% on selling the oranges alone, and a total profit of 32% on selling all the fruits, then the marked price of each mango was _____

ANSWER 60

SOLUTION

Step 1 — cost prices.

$\text{Oranges} = 3 \times 20 = 60, \quad \text{Mangoes} = 5 \times 38 = 190, \quad \text{Total} = 250$

Step 2 — use the 50% profit on oranges.

$\text{SP of oranges} = 60 \times 1.5 = 90$

A 25% discount means he receives 75% of the marked price:

$0.75 \times MP_{\text{oranges}} = 90 \Rightarrow MP_{\text{oranges}} = 120$

Step 3 — use the 32% overall profit.

$\text{Total SP} = 250 \times 1.32 = 330 \Rightarrow \text{SP of mangoes} = 330 - 90 = 240$

Step 4 — undo the 20% discount. He receives 80% of the marked price:

$0.80 \times MP_{\text{mangoes}} = 240 \Rightarrow MP_{\text{mangoes}} = 300$

Step 5 — per mango. There are 5 mangoes:

$\frac{300}{5} = 60$

Answer: 60

Shortcut

Work in totals and only divide by 5 at the very end — carrying "per mango" through the whole calculation is where people slip. Also note the orange marked price (120) is never actually needed; only its selling price of 90 matters.

---

5 QA NUMBER SYSTEM REMAINDER THEOREM ●●●●●○○○○○ 5 /10

The remainder when $7^{103} + 7^{101}$ is divided by 9 is ___

ANSWER 2

SOLUTION

Step 1 — factor out the smaller power.

$7^{103} + 7^{101} = 7^{101}\left(7^2 + 1\right) = 7^{101} \times 50$

Step 2 — find the cycle of 7 modulo 9.

$7^1 \equiv 7, \qquad 7^2 \equiv 49 \equiv 4, \qquad 7^3 \equiv 28 \equiv 1 \ (mod\, 9)$

The powers repeat every **3** steps.

Step 3 — reduce the exponent. $101 = 3 \times 33 + 2$, so

$7^{101} \equiv 7^2 \equiv 4 \ (mod\, 9)$

Step 4 — handle the other factor. $50 = 45 + 5 \equiv 5 \ (mod\, 9)$.

Step 5 — multiply.

$7^{101} \times 50 \equiv 4 \times 5 = 20 \equiv 2 \ (mod\, 9)$

Answer: 2

Shortcut

Factoring first is what makes this quick — $7^{101}\left(7^2 + 1\right)$ turns two large powers into one. And $7^3 \equiv 1 \ (mod\, 9)$ is worth memorising: it collapses any power of 7 to one of three values.

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6 QA ARITHMETIC RATIO AND PROPORTION ●●●●●●○○○○ 6 /10

In a company, initially the ratio of the foreign and domestic workers was 5 : 8. When some foreign and 12 domestic workers left the company, this ratio became 2 : 3. Later, when 10 more foreign workers were replaced by 10 new domestic workers, this ratio became 3 : 7. The initial number of domestic workers in the company was _____

ANSWER 72

SOLUTION

Step 1 — set up with one multiplier. Let the initial counts be $5k$ foreign and $8k$ domestic, and let f foreign workers leave alongside the 12 domestic ones.

Step 2 — the first change.

$\frac{5k - f}{8k - 12} = \frac{2}{3} \Rightarrow 15k - 3f = 16k - 24 \Rightarrow 3f = 24 - k$

Step 3 — the second change. "Replaced" means 10 leave the foreign side and 10 join the domestic side:

$\frac{5k - f - 10}{8k - 12 + 10} = \frac{3}{7} \Rightarrow 7\left(5k - f - 10\right) = 3\left(8k - 2\right)$

$35k - 7f - 70 = 24k - 6 \Rightarrow 11k - 7f = 64$

Step 4 — substitute. From Step 2, $f = \frac{24 - k}{3}$:

$11k - \frac{7\left(24 - k\right)}{3} = 64 \Rightarrow 33k - 168 + 7k = 192 \Rightarrow 40k = 360 \Rightarrow k = 9$

Step 5 — answer the question asked.

$\text{Initial domestic} = 8k = 72$

Check: start $45 : 72$. Then $f = 5$ leave with 12 domestic $\rightarrow 40 : 60 = 2 : 3$ ✓. Then $30 : 70 = 3 : 7$ ✓

Answer: 72

Shortcut

Two traps. First, "replaced" changes **both** sides — -10 foreign and $+10$ domestic. Second, the question wants the initial **domestic** count $8k$, not k and not the foreign count. Write down what you are solving for before you start.

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7 QA HIGHER ALGEBRA MATRICES AND DETERMINANTS 7 /10

Let $M = \begin{bmatrix} 1 & 1 & 1 \\ a & b & c \\ a^2 & b^2 & c^2 \end{bmatrix}$ where a, b and c are real numbers such that $a+b+c=0$ and $abc \neq 0$. If $\det M = 0$, then the maximum possible value of $\frac{a^2+b^2}{c^2}$ is _____

ANSWER 5

SOLUTION

Step 1 — recognise the Vandermonde determinant. For this standard matrix,

$$\det M = (b-a)(c-a)(c-b)$$

Step 2 — read off what $\det M = 0$ means. A product is zero only if a factor is zero, so **two of a, b, c must be equal**. (They cannot all be zero, since $abc \neq 0$.)

Step 3 — try each case against $a+b+c=0$.

Case $a=b$: then $2a+c=0 \Rightarrow c=-2a$.

$$\frac{a^2+b^2}{c^2} = \frac{2a^2}{4a^2} = \frac{1}{2}$$

Case $b=c$: then $a=-2b$, and $c=b$.

$$\frac{a^2+b^2}{c^2} = \frac{4b^2+b^2}{b^2} = 5$$

Case $a=c$: then $b=-2a$, and $c=a$.

$$\frac{a^2+b^2}{c^2} = \frac{a^2+4a^2}{a^2} = 5$$

Step 4 — take the maximum.

$$\max = 5$$

Answer: 5

Shortcut

Two facts do all the work: the Vandermonde form makes $\det M = 0$ mean "two variables are equal", and the denominator is c^2, so you want c to be the **small** one. That is the case where c equals one of the others and the third is $-2c$, giving $(4+1)/1 = 5$ immediately.

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8 QA ARITHMETIC SIMPLE INTEREST AND COMPOUND INTEREST 4 /10

Savitri borrowed 10000 rupees from a bank for a period of two years at a fixed interest rate of 10% per annum, compounded semi-annually, and paid back 5025 rupees at the end of first year. Then, the amount, in rupees, to be paid at the end of second year is_____

ANSWER 6615

SOLUTION

Step 1 — convert to the compounding period. 10% per annum compounded **semi-annually** means

$$\text{rate per half-year} = 5\%, \qquad \text{periods per year} = 2$$

Step 2 — grow the loan through year 1 (two half-year periods):

$$10000 \times (1.05)^2 = 10000 \times 1.1025 = 11025$$

Step 3 — subtract the repayment.

$$11025 - 5025 = 6000$$

Step 4 — grow the balance through year 2 (two more periods):

$$6000 \times (1.05)^2 = 6000 \times 1.1025 = 6615$$

Answer: 6615

Shortcut

The repayment of 5025 is chosen so the balance lands on a round 6000 — if your year-1 figure isn't 11025, you have used 10% instead of 5% per period. After that it is one multiplication by 1.1025.

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9 QA ARITHMETIC PERCENTAGE 6 /10

The Celsius scale of temperature can be converted to Fahrenheit scale using the relationship $F = 1.8C + 32$, where F and C are temperature recorded in degrees Fahrenheit and Celsius, respectively. Ajay noted down the temperature of a chemical reaction as x degrees Fahrenheit but reported it as x degrees Celsius by mistake. If this led to a recording of the temperature that was 144% higher than the actual temperature in Celsius scale, then x equals ___

ANSWER 122

SOLUTION

Step 1 — identify the two numbers being compared.

- The **actual** temperature in Celsius is C, where $x = 1.8C + 32$ (since x was the Fahrenheit reading).
- The **reported** temperature in Celsius is the number x itself.

Step 2 — translate "144% higher". Higher *by* 144% means the reported value is 244% of the actual:

$$x = C(1 + 1.44) = 2.44\,C$$

Step 3 — substitute $C = \frac{x-32}{1.8}$.

$$x = 2.44 \times \frac{x - 32}{1.8}$$

Step 4 — solve.

$1.8x = 2.44x - 78.08 \Rightarrow 0.64x = 78.08 \Rightarrow x = 122$

Check: 122°F is $(122 - 32)/1.8 = 50^\circ$C, and 122 is indeed 144% more than 50. ✓

Answer: 122

Shortcut

"144% higher" means multiply by 2.44, not 1.44 — that single word costs more marks than the algebra. Spot that $122^\circ\text{F} = 50^\circ\text{C}$ and the check is instant.

Want this paper scored, ranked and analysed? Attempt it on the exam interface. Take the test

10 QA LOGICAL REASONING DEDUCTIVE REASONING 6 /10

The number of ways in which a pair of friends can be chosen for a trip from those who like Adventure Sports is ___

ANSWER 3

SOLUTION

Step 1 — list what is possible. With three activities, a person can like one, two or all three. The two-activity subsets are exactly three:

$\{\text{CS}, \text{SH}\}, \quad \{\text{CS}, \text{AS}\}, \quad \{\text{SH}, \text{AS}\}$

Step 2 — place A, B and E. All three like exactly two activities, and no two friends share the same set. There are only three two-activity sets, so **A, B and E take all three of them**, one each (in some order we cannot determine — and never need to).

Step 3 — place D. Given directly: D likes only Countryside Sightseeing, a one-activity set.

Step 4 — place C. C likes *more* activities than D, so C likes two or three. But every two-activity set is already used by A, B and E, and no two friends may match. Therefore

$\text{C likes all three activities.}$

Step 5 — the complete picture.

Friend	Activities liked	How many
A, B, E	the three two-activity sets, one each	2 each
C	Countryside Sightseeing, Shopping, Adventure Sports	3
D	Countryside Sightseeing only	1

Although we cannot say *which* pair each of A, B and E likes, every question below depends only on **counts**, which are fully determined.

Who likes Adventure Sports?

- Of the three two-activity sets, **two** contain Adventure Sports: $\{\text{CS}, \text{AS}\}$ and $\{\text{SH}, \text{AS}\}$. So two of A, B, E qualify.
- C likes all three, so C qualifies.
- D likes only Countryside Sightseeing, so D does not.

Total $= 2 + 1 = 3$ friends

Choosing a pair from them:

$$\binom{3}{2} = 3$$

Answer: 3

Shortcut

You never need to know which friend likes what — only how many like Adventure Sports. Two of the three pairs contain AS, plus C, giving 3 people and $\binom{3}{2} = 3$ pairs.

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11 QA MODERN MATHS PERMUTATION AND COMBINATION ●●●●●●○○○ 6 /10

The number of ways in which three distinct integers can be chosen from the set $\{1, 2, ..., 9\}$ such that their product is divisible by 4, is ___

ANSWER 54

SOLUTION

Step 1 — count everything, then subtract. Total selections:

$$\binom{9}{3} = 84$$

Step 2 — classify by powers of 2. Among 1 to 9:

- odd numbers: $1, 3, 5, 7, 9$ — five of them, contributing no factor of 2
- 2 and 6 — contribute exactly **one** factor of 2
- 4 and 8 — contribute **two or more** factors of 2

The product is divisible by 4 when the total power of 2 is at least 2.

Step 3 — count the failures instead. The product is *not* divisible by 4 only if the total power of 2 is 0 or 1:

All three odd: $\binom{5}{3} = 10$

Exactly one even, and that even is 2 or 6 (two odds alongside): $2 \times \binom{5}{2} = 2 \times 10 = 20$

(If the single even were 4 or 8 it would already supply 2^2, and two evens always give at least 2^2.)

Not divisible by $4 = 10 + 20 = 30$

Step 4 — subtract.

$84 - 30 = 54$

Answer: 54

Shortcut

Always count the complement here — "divisible by 4" splits into several cases, but "not divisible by 4" has just two. The key insight is that 4 and 8 are worth two factors of 2 on their own, so only 2 and 6 can appear alone and still fail.

Refers to the LR set above.

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12 QA LOGICAL REASONING DEDUCTIVE REASONING 6 /10

The number of friends who like both Shopping and Adventure Sports is _____

ANSWER 2

SOLUTION

Step 1 — list what is possible. With three activities, a person can like one, two or all three. The two-activity subsets are exactly three:

$$\{\mathrm{CS}, \mathrm{SH}\}, \quad \{\mathrm{CS}, \mathrm{AS}\}, \quad \{\mathrm{SH}, \mathrm{AS}\}$$

Step 2 — place A, B and E. All three like exactly two activities, and no two friends share the same set. There are only three two-activity sets, so **A, B and E take all three of them**, one each (in some order we cannot determine — and never need to).

Step 3 — place D. Given directly: D likes only Countryside Sightseeing, a one-activity set.

Step 4 — place C. C likes *more* activities than D, so C likes two or three. But every two-activity set is already used by A, B and E, and no two friends may match. Therefore

$$\mathrm{C\ likes\ all\ three\ activities.}$$

Step 5 — the complete picture.

Friend	Activities liked	How many
A, B, E	the three two-activity sets, one each	2 each
C	Countryside Sightseeing, Shopping, Adventure Sports	3
D	Countryside Sightseeing only	1

Although we cannot say *which* pair each of A, B and E likes, every question below depends only on **counts**, which are fully determined.

Who likes *both* Shopping and Adventure Sports?

- Among the two-activity sets, exactly **one** is $\{\mathrm{SH}, \mathrm{AS}\}$ — so one of A, B, E.
- C likes all three, so C also likes both.
- D likes only Countryside Sightseeing — no.

$$1 + 1 = 2$$

Answer: 2

Shortcut

"Both" includes the person who likes **all three** — forgetting C is the standard slip. One two-activity set plus C gives 2.

13 QA ALGEBRA SEQUENCES AND SERIES 5 /10

Let S denote an arithmetic progression whose first term is either 132 or 158, and the common difference is an even integer less than 10. If the n^{th} term of S is 174, then the number of possible distinct values of n is ___

ANSWER 5

SOLUTION

Step 1 — write the condition. With first term a and common difference d:

$a + (n-1)\,d = 174 \Rightarrow (n-1)\,d = 174 - a$

Since $174 > a$ in both cases, d must be positive; the even positive values below 10 are $d \in \{2, 4, 6, 8\}$.

Step 2 — case $a = 132$. Then $(n-1)\,d = 42$:

d	$42/d$	n
2	21	**22**
4	10.5	not an integer
6	7	**8**
8	5.25	not an integer

Step 3 — case $a = 158$. Then $(n-1)\,d = 16$:

d	$16/d$	n
2	8	**9**
4	4	**5**
6	2.67	not an integer
8	2	**3**

Step 4 — collect the distinct values.

$n \in \{22,\ 8,\ 9,\ 5,\ 3\} \Rightarrow 5$ values

Answer: 5

Shortcut

This is a divisor hunt, not an AP question: you need d to divide $174 - a$. So compute 42 and 16, then just ask which of $2, 4, 6, 8$ divide each. Two divisors for 42, three for 16.

Refers to the LR set above.

14 QA LOGICAL REASONING DEDUCTIVE REASONING 6 /10

The number of friends that like Countryside Sightseeing is _____

ANSWER 4

SOLUTION

Step 1 — list what is possible. With three activities, a person can like one, two or all three. The two-activity subsets are exactly three:

$\{\text{CS}, \text{SH}\}, \quad \{\text{CS}, \text{AS}\}, \quad \{\text{SH}, \text{AS}\}$

Step 2 — place A, B and E. All three like exactly two activities, and no two friends share the same set. There are only three two-activity sets, so **A, B and E take all three of them**, one each (in some order we cannot determine — and never need to).

Step 3 — place D. Given directly: D likes only Countryside Sightseeing, a one-activity set.

Step 4 — place C. C likes *more* activities than D, so C likes two or three. But every two-activity set is already used by A, B and E, and no two friends may match. Therefore

$\text{C likes all three activities.}$

Step 5 — the complete picture.

Friend	Activities liked	How many
A, B, E	the three two-activity sets, one each	2 each
C	Countryside Sightseeing, Shopping, Adventure Sports	3
D	Countryside Sightseeing only	1

Although we cannot say *which* pair each of A, B and E likes, every question below depends only on **counts**, which are fully determined.

Who likes Countryside Sightseeing?

- Two of the three two-activity sets contain CS: $\{\text{CS}, \text{SH}\}$ and $\{\text{CS}, \text{AS}\}$ — two of A, B, E.
- C likes all three — yes.
- D likes only Countryside Sightseeing — yes.

$2 + 1 + 1 = 4$

Answer: 4

Shortcut

Count by category: two of the pairs, plus C (all three), plus D (CS only). Only one of A, B, E is excluded — the one who likes $\{\text{SH}, \text{AS}\}$.

15 QA ALGEBRA INEQUALITIES & MODULUS 6 /10

If n is an integer such that $\frac{|n+6|-|n-3|}{\sqrt{100-n^3}} \geq 0$, then the number of possible values of n is

ANSWER 6

SOLUTION

Step 1 — deal with the denominator first. For the square root to be defined *and* non-zero we need

$100 - n^3 > 0 \Rightarrow n^3 < 100$

Since $4^3 = 64 < 100$ but $5^3 = 125 > 100$, this gives $n \leq 4$. Note the denominator is then **positive**.

Step 2 — so the sign is decided by the numerator.

$|n+6| \geq |n-3|$

Step 3 — square both sides (both are non-negative, so this is safe):

$(n+6)^2 \geq (n-3)^2$

$n^2 + 12n + 36 \geq n^2 - 6n + 9$

$18n \geq -27 \Rightarrow n \geq -1.5$

For integers, $n \geq -1$.

Step 4 — combine both conditions.

$-1 \leq n \leq 4 \Rightarrow n \in \{-1, 0, 1, 2, 3, 4\}$

6 values

Answer: 6

Shortcut

Check the denominator before touching the modulus — it is what caps n at 4, and it is positive throughout, so the inequality reduces to the numerator alone. Then $|n+6| \geq |n-3|$ just says n is closer to -6... no, *farther from* -6 than from 3 is false; squaring is the safe one-line route.

COMMON DATA SET

Five friends – Countryside Sightseeing, Shopping and Adventure Sports

Five friends A, B, C, D, and E go on a trip together. Each of them likes at least one of the following three activities: Countryside Sightseeing, Shopping, and Adventure Sports such that:

- No two friends like exactly the same set of activities.
- A, B and E like exactly two activities each.
- D likes only Countryside Sightseeing.
- C likes more number of activities compared to D.

This set covers Q10, Q12, Q14.

ATTEMPT THIS SECTION

Type the answer, like the real thing

Short-answer questions give no options to work backwards from and carry no negative marking — the only way to build that reflex is to practise on the same interface. Attempt this paper section by section, timed, and get an instant score with a question-wise analysis.

Attempt QA (SA) →

Free login

SECTION 2

QA-MCQ

Quantitative Ability — MCQ

30	120	40 min	+4 / −1
QUESTIONS	MARKS	SECTIONAL LIMIT	MARKING

MCQ (incl. a 5-question DI set)

MOST ASKED HERE: Algebra 8 · Modern Maths 5 · Data Interpretation 5 · Arithmetic 3 · Number System 3

16 QA ARITHMETIC TIME SPEED AND DISTANCE ●●●●●●●○○ 7 /10

Two locations A and B are at diametrically opposite ends of a circular track. Rekha starts running along the track from location A in the clockwise direction. Sajal starts running simultaneously along the track in the anticlockwise direction from location B. If the length of the circular track is 14 km, and the speeds of Rekha and Sajal are in the ratio 5 : 2, then the distance, in km, travelled by Rekha, when they meet at location B for the first time, is

(A) 35
(B) 49
(C) 7
(D) 21

ANSWER (a) 35

SOLUTION

Step 1 — note the geometry. A and B are diametrically opposite on a 14 km track, so the arc from A to B is 7 km either way.

Step 2 — when is each runner at B?

Rekha starts at A, so she reaches B after 7 km, then every full lap after that:

$$\text{Rekha's distance at B} = 7 + 14k, \qquad k = 0, 1, 2, \ldots$$

Sajal starts **at** B, so he returns to B after each complete lap:

$$\text{Sajal's distance at B} = 14m, \qquad m = 1, 2, \ldots$$

Step 3 — they must be there at the same time. With speeds $5v$ and $2v$:

$$\frac{7 + 14k}{5v} = \frac{14m}{2v} \Rightarrow \frac{7 + 14k}{5} = 7m \Rightarrow 1 + 2k = 5m$$

Step 4 — find the smallest solution. Try $m = 1$: $1 + 2k = 5 \Rightarrow k = 2$. ✓

$$\text{Rekha's distance} = 7 + 14\,(2) = 35 \text{ km}$$

Check: time $= 35/(5v) = 7/v$; Sajal covers $2v \times 7/v = 14$ km = one full lap, so he is back at B. ✓

Answer: (a) — 35

Shortcut

The condition is not "they meet" but "they meet **at B**", so write down separately when each is at B and match the times. Since their speeds are $5:2$, in the time Rekha covers 35 km Sajal covers 14 — exactly one lap. Checking the ratio against the options gets you there fast.

---

17 QA NUMBER SYSTEM HCF AND LCM ●●●●●●●○○○ 7 /10

The number of integers n such that $1 \le n \le 10^7$ and $\gcd\left(n, 10^7\right) = 10^3$ is _____.

(A) 5000 (B) 2000

(C) 3000 (D) **4000**

ANSWER (d) 4000

SOLUTION

Step 1 — write n in terms of the required gcd. If $\gcd\left(n, 10^7\right) = 10^3$, then 10^3 divides n, so put $n = 10^3 m$

Step 2 — translate the gcd condition onto m. Since $10^7 = 10^3 \times 10^4$,

$$\gcd\left(10^3 m,\ 10^3 \cdot 10^4\right) = 10^3 \gcd\left(m, 10^4\right) = 10^3 \ \Rightarrow\ \gcd\left(m, 10^4\right) = 1$$

So m must share no factor of 2 or 5 with 10^4 — that is, m must be **coprime to 10**.

Step 3 — find the range of m. From $n \le 10^7$ we get $m \le 10^4$.

Step 4 — count integers up to 10^4 coprime to 10. Remove multiples of 2 and of 5:

$$10^4 \times \left(1 - \frac{1}{2}\right)\left(1 - \frac{1}{5}\right) = 10^4 \times \frac{1}{2} \times \frac{4}{5} = 4000$$

Answer: (d) — 4000

Shortcut

Every "gcd equals d" question becomes "write $n = dm$ and make m coprime to the rest". Here that leaves counting numbers up to 10^4 coprime to 10, which is just $\frac{1}{2} \times \frac{4}{5}$ of them — 40%, so 4000.

---

18 QA ARITHMETIC TIME AND WORK ●●●●●○○○○○ 5 /10

Painter A can paint a building in 12 days while Painter B can paint it in 16 days. If A and B work on alternate days, and A starts the work on the first day, then the number of days required to paint the building is

(A) $7\frac{6}{7}$ (B) $13\frac{2}{3}$

(C) $13\frac{3}{4}$ (D) $13\frac{1}{2}$

ANSWER (b) $13\frac{2}{3}$

SOLUTION

Step 1 — put the work on a common scale. Take the building as $lcm\ (12, 16) = 48$ units.

$$\text{A's rate} = \frac{48}{12} = 4 \text{ units/day}, \qquad \text{B's rate} = \frac{48}{16} = 3 \text{ units/day}$$

Step 2 — look at a two-day block. A works day 1, B day 2:

$4 + 3 = 7$ units every 2 days

Step 3 — run as many full blocks as possible.

6 blocks $= 12$ days $= 42$ units

Remaining: $48 - 42 = 6$ units.

Step 4 — finish off day by day. Day 13 is A's turn: she adds 4 units, total 46. Remaining 2 units.

Day 14 is B's turn, at 3 units/day:

$$\text{time needed} = \frac{2}{3} \text{ of a day}$$

Step 5 — total.

$$13 + \frac{2}{3} = 13\frac{2}{3} \text{ days}$$

Answer: (b) — $13\frac{2}{3}$

Shortcut

Never divide 48 by the two-day average — alternate-day problems must be run in blocks and then finished one day at a time, because the last worker may not need a full day. The fractional part always comes from the final partial day.

---

19 QA COORDINATE GEOMETRY CIRCLES ●●●●●●●○○○ 7 /10

Let $ABCD$ be a rectangle with $AB = 72$ cm and $BC = 30$ cm. A circle passing through points A and C cuts the side AB at P such that $AP = 56$ cm. The radius, in cm, of the circle is

(A) $\frac{220}{5}$ (B) $\frac{216}{5}$

(C) $\frac{221}{5}$ (D) $\frac{441}{10}$

ANSWER (c) $\frac{221}{5}$

SOLUTION

Step 1 — set coordinates. Put $A = (0,0)$, $B = (72,0)$, $C = (72,30)$, $D = (0,30)$. Then P lies on AB with $AP = 56$, so $P = (56,0)$.

The circle passes through $A(0,0)$, $P(56,0)$ and $C(72,30)$.

Step 2 — use the general circle equation. Let

$x^2 + y^2 + Dx + Ey + F = 0$

Through $A(0,0)$ *:* $F = 0$.

Through $P(56,0)$ *:* $56^2 + 56D = 0 \Rightarrow D = -56$.

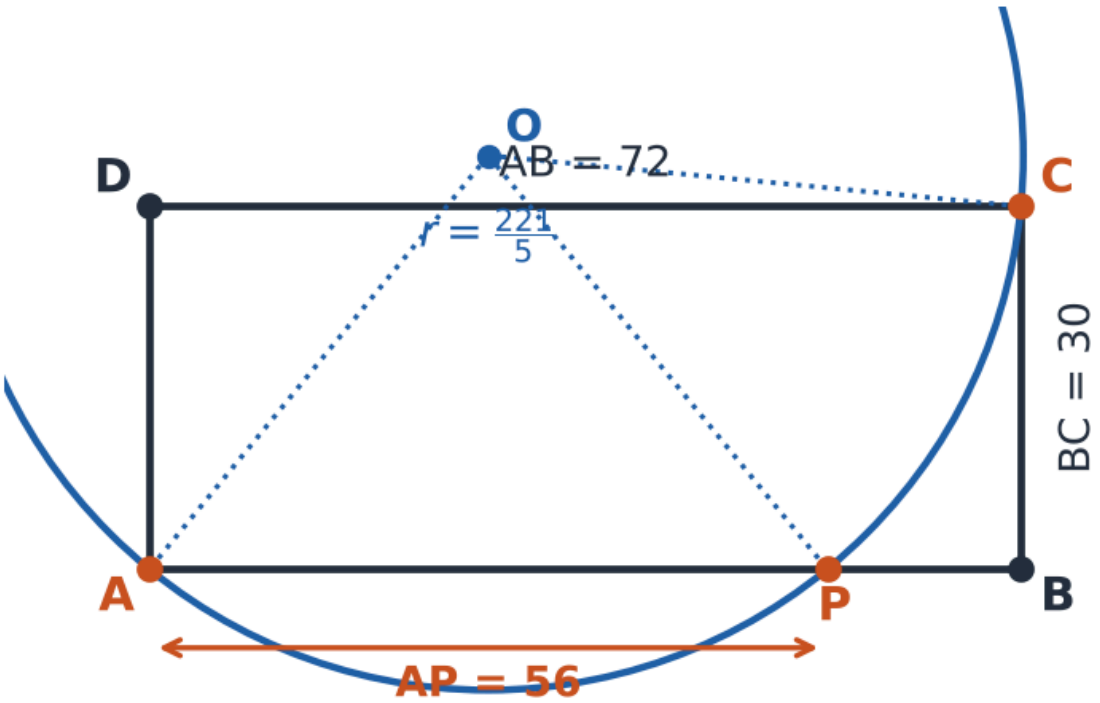
Through $C(72,30)$ *:*

$$5184 + 900 - 56(72) + 30E = 0 \Rightarrow 6084 - 4032 + 30E = 0 \Rightarrow E = -\frac{342}{5}$$

Step 3 — radius formula.

$$r = \frac{1}{2}\sqrt{D^2 + E^2 - 4F} = \frac{1}{2}\sqrt{3136 + \frac{116964}{25}} = \frac{1}{2}\sqrt{\frac{78400 + 116964}{25}}$$

$$= \frac{1}{2} \cdot \frac{\sqrt{195364}}{5} = \frac{1}{2} \cdot \frac{442}{5} = \frac{221}{5}$$



Answer: (c) — $\frac{221}{5}$

Shortcut

Because A and P both sit on the x-axis, the centre lies on the vertical line $x = 28$ (their perpendicular bisector). Then one distance equation in the remaining unknown finishes it — faster than the general-equation route, and it avoids the big square root.

---

20 QA HIGHER ALGEBRA MATRICES AND DETERMINANTS ●●●●○○○○○○ 4 /10

If $A = \begin{bmatrix} 1 & 1 \\ 0 & 1 \end{bmatrix}$, then the determinant of $A + A^2 + A^3 + \cdots + A^{13}$ is

(A) 91 (B) 13

(C) 169 (D) 26

ANSWER (c) 169

SOLUTION

Step 1 — find the pattern in the powers.

$$A^2 = \begin{bmatrix} 1 & 2 \\ 0 & 1 \end{bmatrix}, \quad A^3 = \begin{bmatrix} 1 & 3 \\ 0 & 1 \end{bmatrix}, \quad \ldots \quad A^n = \begin{bmatrix} 1 & n \\ 0 & 1 \end{bmatrix}$$

(Each multiplication by A simply adds 1 to the top-right entry.)

Step 2 — add the first 13 powers.

$$\sum_{n=1}^{13} A^n = \begin{bmatrix} 13 & 1+2+\cdots+13 \\ 0 & 13 \end{bmatrix} = \begin{bmatrix} 13 & 91 \\ 0 & 13 \end{bmatrix}$$

using $1+2+\cdots+13 = \frac{13\times 14}{2} = 91$.

Step 3 — take the determinant. For an upper-triangular matrix it is the product of the diagonal:

$13 \times 13 = 169$

Answer: (c) — 169

Shortcut

The matrix is upper triangular with 1s on the diagonal, so the sum is upper triangular with 13s on the diagonal and the determinant is 13^2 — the top-right entry 91 never matters. Option (a) 91 is there to catch anyone who computes the sum and stops.

---

21 QA COORDINATE GEOMETRY CIRCLES ●●●●●●○○○○ 6 /10

Let the circle $x^2+y^2 = 2ax+2by$ intersect the x-axis at point $A\,(\,\alpha, 0\,)$ and y-axis at point $B\,(\,0, \beta\,)$, where $\alpha\beta \neq 0$. If the point $C\,(\,p, q\,)$ lies on the chord AB, then $\frac{p+\alpha}{a} + \frac{q+\beta}{b}$ equals

(A) 3 (B) 4

(C) 2 (D) 6

ANSWER (d) 6

SOLUTION

Step 1 — find the intercepts. Write the circle as $x^2+y^2-2ax-2by = 0$ (it passes through the origin).

On the x-axis ($y=0$): $x^2-2ax=0 \Rightarrow x=0$ or $x=2a$, so $\alpha = 2a$.

On the y-axis ($x=0$): $y^2-2by=0 \Rightarrow y=0$ or $y=2b$, so $\beta = 2b$.

Step 2 — write the chord AB. It joins $(\,2a, 0\,)$ and $(\,0, 2b\,)$, so in intercept form:

$$\frac{x}{2a} + \frac{y}{2b} = 1$$

Step 3 — use the fact that $C\,(\,p, q\,)$ lies on it.

$$\frac{p}{2a} + \frac{q}{2b} = 1 \;\Rightarrow\; \frac{p}{a} + \frac{q}{b} = 2$$

Step 4 — assemble the required expression.

$$\frac{p+\alpha}{a} + \frac{q+\beta}{b} = \frac{p+2a}{a} + \frac{q+2b}{b} = \left(\frac{p}{a}+\frac{q}{b}\right) + 2 + 2 = 2+4 = 6$$

Answer: (d) — 6

Shortcut

Everything collapses once you see $\alpha = 2a$ and $\beta = 2b$. Then $\frac{\alpha}{a} + \frac{\beta}{b} = 4$ outright, and the chord condition supplies the remaining 2. No coordinates for C are ever needed.

---

22 QA MODERN MATHS PROBABILITY 6 /10

Three dice are thrown simultaneously and the sum of the three numbers appearing on the top faces of the dice is found to be 10. The probability that these three numbers are distinct, is

(A) $\frac{3}{4}$ (B) $\frac{2}{3}$

(C) $\frac{3}{5}$ (D) $\frac{1}{2}$

ANSWER (b) $\frac{2}{3}$

SOLUTION

This is a **conditional** probability: the sample space is already restricted to sums of 10.

Step 1 — count all ordered triples summing to 10. Substituting $a' = a - 1$ etc., we need $a' + b' + c' = 7$ with each between 0 and 5:

$$\binom{9}{2} - 3\binom{3}{2} = 36 - 9 = 27$$

(The subtraction removes cases where one variable exceeds 5.)

Step 2 — count those with all three distinct. Find the sets of three distinct values from 1–6 summing to 10:

$\{1,3,6\}, \quad \{1,4,5\}, \quad \{2,3,5\}$

Each set can be arranged in $3! = 6$ ways:

$3 \times 6 = 18$

Step 3 — divide.

$$P = \frac{18}{27} = \frac{2}{3}$$

Answer: (b) — $\frac{2}{3}$

Shortcut

The denominator is 27, not 216 — the sum of 10 is **given**, so it is conditional. Then list only the distinct-value *sets* (just three of them) and multiply by 6. The repeats you are excluding are $\{2,2,6\}$, $\{4,4,2\}$, $\{3,3,4\}$ and $\{1,1,8\}$ (impossible).

---

23 QA ALGEBRA FUNCTIONS 8 /10

If x is a real number such that $\max\ (\ \min\ (x, 2-x)\ ,\ x-4,\ 2x-8\ ) = \pi - 3$, then the number of possible values of x is

(A) 4 (B) 6

(C) 5 (D) 3

ANSWER (d) 3

SOLUTION

Write $c = \pi - 3 \approx 0.1416$, a small positive number. We need the **largest** of three quantities to equal c, which means one of them equals c and the other two are at most c.

Step 1 — the candidate $\min\ (x, 2-x)\ = c$**.** This min equals x when $x \leq 1$ and $2 - x$ when $x > 1$:

- $x = c \approx 0.142$. Check the others: $x - 4 \approx -3.86 \leq c$ ✓, $2x - 8 \approx -7.7 \leq c$ ✓ — **valid**
- $x = 2 - c \approx 1.858$. Then $x - 4 \approx -2.14$ ✓, $2x - 8 \approx -4.28$ ✓ — **valid**

Step 2 — the candidate $x - 4 = c$, i.e. $x = c + 4 \approx 4.142$. But then

$2x - 8 \approx 0.283 > c$

so the maximum would exceed c — **rejected**.

Step 3 — the candidate $2x - 8 = c$, i.e. $x = \frac{c+8}{2} \approx 4.071$. Then

$x - 4 \approx 0.071 \leq c$ ✓, $\min(x, 2 - x) = 2 - x \approx -2.07 \leq c$ ✓

— **valid**

Step 4 — count.

$x \approx 0.142,\ 1.858,\ 4.071 \Rightarrow 3$ values

Answer: (d) — 3

Shortcut

Treat it as three candidate equations and **verify each against the other two** — that rejection step is the whole question. The $\min$ branch naturally gives two solutions (one on each side of its peak at $x = 1$), and of the two linear branches only the steeper one survives.

---

24 QA MODERN MATHS SET THEORY AND VENN DIAGRAMS 7 /10

In a class, 25% of all students read news from the Internet. Moreover, 45% of all students read news from printed newspaper. Further, 20% of all students read news from both the Internet and printed newspaper and they do not play video games. It is also known that 30% of the students who do not read news play video games. The minimum percentage of students who do not play video games is

(A) 25 percent
(B) 45 percent
(C) **55 percent**
(D) 35 percent

ANSWER **(c) 55 percent**

SOLUTION

Take the class as 100 students.

Step 1 — the news readers. With $I = 25$ and $P = 45$,

$|I \cup P| = 25 + 45 - |I \cap P| = 70 - |I \cap P|$

Step 2 — the non-readers.

$\text{non-readers} = 100 - |I \cup P| = 30 + |I \cap P|$

Step 3 — who definitely does not play video games?

- The 20 students who read **both** and do not play games.
- 70% of the non-readers (since 30% of them do play).

$\text{don't play} \geq 20 + 0.7\,(30 + |I \cap P|)$

Step 4 — minimise. The expression grows with $|I \cap P|$, so take it as small as possible. We are told 20% read both and don't play games, so

$|I \cap P| \geq 20$

Putting $|I \cap P| = 20$:

$20 + 0.7\,(\,50\,) \;= 20 + 35 = 55$

Answer: (c) — 55 percent

Shortcut

The phrase "minimum percentage" tells you to push the overlap to its smallest legal value, which the 20% clause pins at exactly 20. After that it is one line: the 20 guaranteed non-players plus 70% of the 50 non-readers.

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25 QA ALGEBRA GRAPHS AND TRANSFORMATIONS ●●●●●●○○○○ 6 /10

The equation $2^x - x^2 = 0$ has

(A) exactly two real solutions

(B) **exactly three real solutions**

(C) exactly one real solution

(D) no real solution

ANSWER **(b) exactly three real solutions**

SOLUTION

Step 1 — rewrite as an intersection problem.

$2^x = x^2$

so we are asking how many times the curve $y = 2^x$ meets $y = x^2$.

Step 2 — find the obvious solutions.

$x = 2$: $\quad 2^2 = 4 = 2^2$ ✓ $\qquad\qquad$ $x = 4$: $\quad 2^4 = 16 = 4^2$ ✓

Step 3 — do not stop there — check negative x. For $x < 0$:

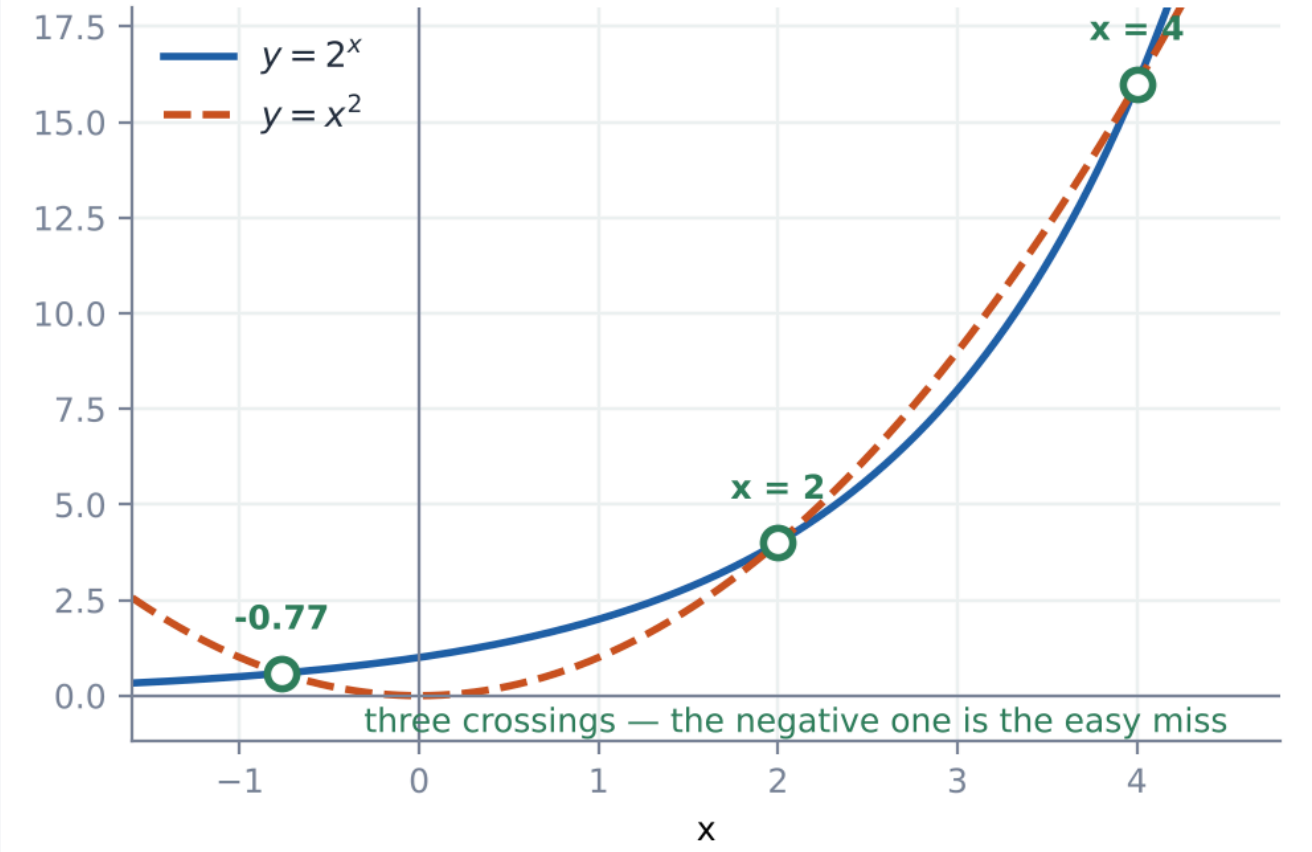
- 2^x is small and positive, falling towards 0
- x^2 is positive and rising as x becomes more negative

At $x = 0$: $2^0 = 1 > 0 = x^2$. At $x = -1$: $2^{-1} = 0.5 < 1 = x^2$.

The difference changes sign between -1 and 0, so there is a **third** root there (near $x \approx -0.767$).

Step 4 — confirm there are no more. For $x > 4$ the exponential grows faster and stays above x^2 forever, and between the roots the curves cross cleanly.

exactly three real solutions



Answer: (b) — exactly three real solutions

Shortcut

Everyone finds $x = 2$ and $x = 4$ and picks "two". The mark is in remembering that x^2 is defined for negative x while 2^x stays positive — guaranteeing one crossing on the left. **Sketch the two curves; never solve this one algebraically.**

---

26 QA ALGEBRA SEQUENCES AND SERIES 8 /10

Gita starts from point A and walks 1000 m east. She then walks 800 m north, followed by 640 m west and 512 m south, reaching point B. After this, she continues moving in the same cyclic order: east, north, west, south, with each successive movement 20% shorter than the previous one. After infinitely many such moves, approximately how far in meters will Gita be from her starting point A?

(A) 765
(B) 800
(C) 781
(D) 711

ANSWER (c) 781

SOLUTION

Step 1 — identify the ratio. Each leg is 80% of the previous one, so $r = 0.8$ (check: $1000 \to 800 \to 640 \to 512$ ✓).

Step 2 — group the legs by direction. Directions repeat every 4 moves, so each direction forms a GP with ratio r^4.

East (moves 1, 5, 9, ...): $\frac{1000}{1-r^4}$

West (moves 3, 7, ...): $\frac{1000r^2}{1-r^4}$

$$\text{Net east} = \frac{1000\,(1-r^2)}{1-r^4} = \frac{1000}{1+r^2} = \frac{1000}{1.64} \approx 609.76$$

using $1-r^4 = (1-r^2)(1+r^2)$.

Step 3 — same for north/south.

$$\text{Net north} = \frac{1000r}{1+r^2} = \frac{800}{1.64} \approx 487.80$$

Step 4 — combine the two perpendicular displacements.

$$\sqrt{609.76^2 + 487.80^2} = \sqrt{371,808 + 237,949} \approx \sqrt{609,757} \approx 781$$

Answer: (c) — 781

Shortcut

The factorisation $1-r^4 = (1-r^2)(1+r^2)$ turns four infinite sums into the single tidy result $\frac{\text{first leg}}{1+r^2}$ for each axis. Note the net north is exactly $0.8\times$ the net east, so the displacement vector has the same $5:4$ shape as the first two legs.

---

27 QA ALGEBRA POLYNOMIALS AND HIGHER DEGREE EQUATIONS 7 /10

The number of values a can take such that $x^4 + ax^3 + (3a-4)x^2 + 2(a-1)x - 4$ can be expressed as a product of two quadratic polynomials, $x^2 + px + 2$ and $x^2 + qx - 2$, where p and q are real, is

(A) 3 (B) 0

(C) 2 (D) 1

ANSWER (d) 1

SOLUTION

Step 1 — multiply the two quadratics out.

$$(x^2+px+2)(x^2+qx-2)$$
$$= x^4 + (p+q)x^3 + (pq-2+2)x^2 + (2q-2p)x - 4$$
$$= x^4 + (p+q)x^3 + pqx^2 + 2(q-p)x - 4$$

Note the x^2 coefficient is simply pq — the $+2$ and -2 cancel.

Step 2 — match coefficients.

$$p+q = a \quad \ldots (i)$$
$$pq = 3a-4 \quad \ldots (ii)$$
$$q-p = a-1 \quad \ldots (iii)$$

Step 3 — solve (i) and (iii) for p and q. Adding and subtracting:

$$q = \frac{2a-1}{2}, \qquad p = \frac{1}{2}$$

Step 4 — substitute into (ii).

$$\frac{1}{2}\cdot\frac{2a-1}{2} = 3a-4 \;\Rightarrow\; 2a-1 = 12a-16 \;\Rightarrow\; 10a = 15 \;\Rightarrow\; a = \frac{3}{2}$$

Exactly **one** value works.

Answer: (d) — 1

Shortcut

Use the two *linear* equations in p, q first — they pin both unknowns in terms of a with no quadratics at all. Only then impose the product condition, which becomes a single linear equation in a. Going via pq first drags you into unnecessary algebra.

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28 QA ALGEBRA LOGARITHMS 4 /10

The approximate value of the expression $2\log_3 3n - \log_3\left(n^2+1\right)$ for a sufficiently large n is

(A) 2
(B) $2 - \log_3 2$
(C) 1
(D) 3

ANSWER (a) 2

SOLUTION

Step 1 — pull the 2 inside the first logarithm.

$$2\log_3(3n) = \log_3(3n)^2 = \log_3 9n^2$$

Step 2 — combine the two logarithms.

$$\log_3 9n^2 - \log_3(n^2+1) = \log_3\left(\frac{9n^2}{n^2+1}\right)$$

Step 3 — take n large. Divide numerator and denominator by n^2:

$$\frac{9n^2}{n^2+1} = \frac{9}{1+\frac{1}{n^2}} \to 9 \quad \text{as } n \to \infty$$

Step 4 — evaluate.

$$\log_3 9 = 2$$

Answer: (a) — 2

Shortcut

For "sufficiently large n", the $+1$ is noise: treat n^2+1 as n^2 straight away, and the expression is $\log_3 \frac{9n^2}{n^2} = \log_3 9$. One step.

A certain number of people contributed to a charity. The first person contributed one rupee. The rule for contribution was that the next person would contribute double the amount already raised. If the total money raised for the charity was 2187 rupees, then the number of people who contributed to the charity is

(A) 9
(B) 7
(C) 8
(D) 6

ANSWER (c) 8

SOLUTION

Step 1 — track the running total, not the individual gifts. Each person gives **twice what has already been raised**, so after their contribution the total becomes

$$\text{old total} + 2 \times \text{old total} = 3 \times \text{old total}$$

The total **triples** with every new contributor.

Step 2 — list the totals.

People	Total
1	$1 = 3^0$
2	$3 = 3^1$
3	$9 = 3^2$
k	3^{k-1}

Step 3 — solve.

$$3^{k-1} = 2187 = 3^7 \Rightarrow k - 1 = 7 \Rightarrow k = 8$$

Answer: (c) — 8

Shortcut

Spot that the *total* forms a GP with ratio 3 — far cleaner than tracking what each person gives. Then just recognise $2187 = 3^7$ and remember the first person corresponds to 3^0, so add one.

30 QA GEOMETRY AND MENSURATION MENSURATION 2D 5 /10

A person walks one lap along a circle at a speed v. Thereafter, he runs one lap along the boundary of the largest square that can be inscribed in the circle at a speed $3v$. The ratio of the time he walks to the time he runs is

(A) $\frac{12}{\pi}$

(B) $\frac{3\pi}{4\sqrt{2}}$

(C) $\frac{4\pi}{3\sqrt{2}}$

(D) $\frac{3\pi}{2\sqrt{2}}$

ANSWER (d) $\frac{3\pi}{2\sqrt{2}}$

SOLUTION

Step 1 — the two distances. Let the circle have radius r.

$$\text{Circle lap} = 2\pi r$$

The largest inscribed square has the circle's **diameter** as its diagonal:

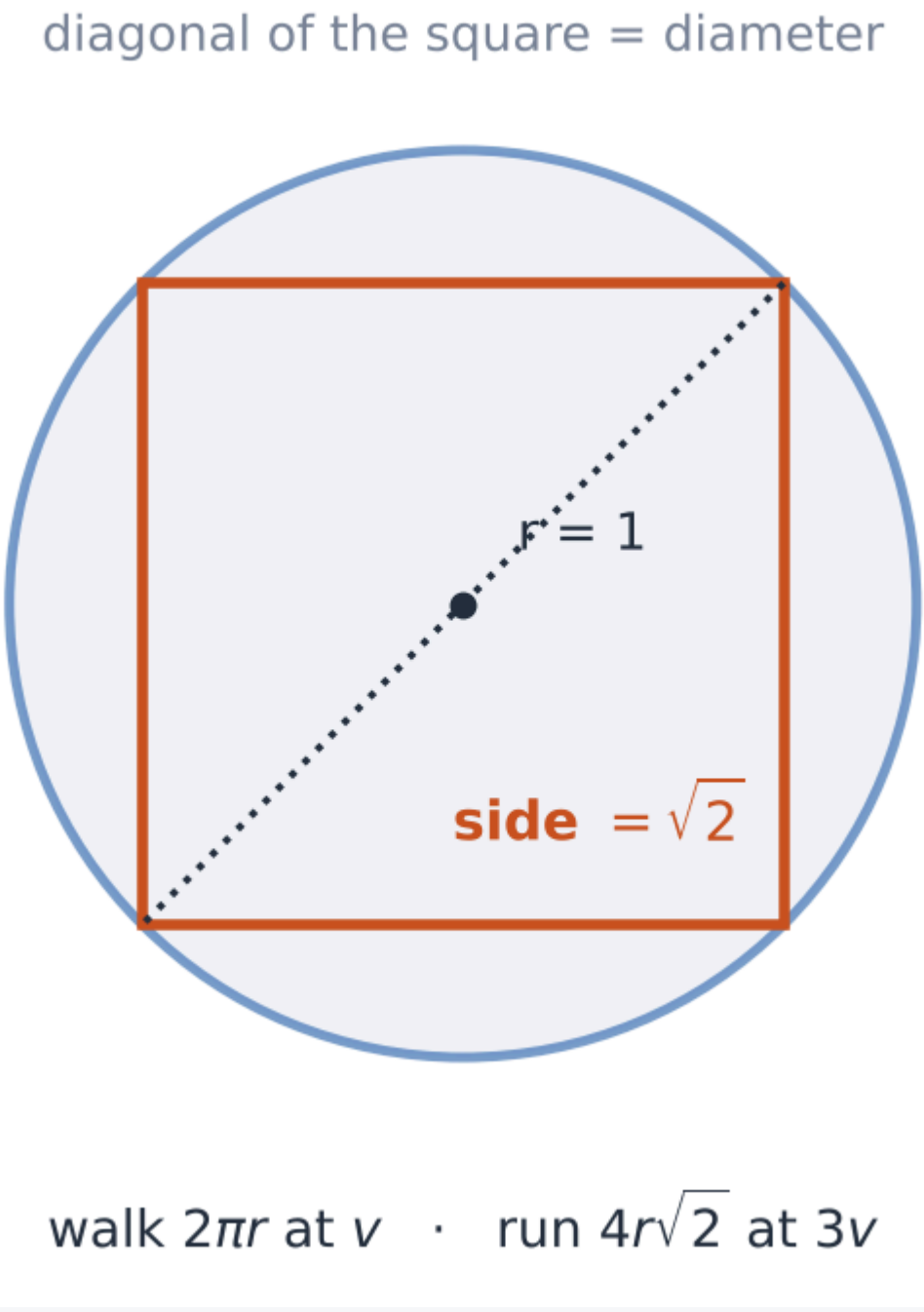
$$\text{diagonal} = 2r \;\Rightarrow\; \text{side} = \frac{2r}{\sqrt{2}} = r\sqrt{2} \;\Rightarrow\; \text{perimeter} = 4r\sqrt{2}$$

Step 2 — the two times.

$$t_{\text{walk}} = \frac{2\pi r}{v}, \qquad t_{\text{run}} = \frac{4r\sqrt{2}}{3v}$$

Step 3 — take the ratio. The r and v both cancel:

$$\frac{t_{\text{walk}}}{t_{\text{run}}} = \frac{2\pi r}{v} \times \frac{3v}{4r\sqrt{2}} = \frac{6\pi}{4\sqrt{2}} = \frac{3\pi}{2\sqrt{2}}$$



Answer: (d) — $\frac{3\pi}{2\sqrt{2}}$

Shortcut

Set $r = 1$ immediately — the ratio cannot depend on it. Then it is 2π against $\frac{4\sqrt{2}}{3}$, and the only thing to remember is that the inscribed square's **diagonal** is the diameter, so its side is $\sqrt{2}$, not 2.

31 QA COORDINATE GEOMETRY CIRCLES 6 /10

A circle of non-zero radius has origin as its centre. If it passes through the point of intersection of two curves $y^2 = 4ax$ and $x^2 = 4ay$, then its equation is

(A) $x^2 + y^2 = a^2$

(B) $x^2 + y^2 = 4a^2$

(C) $x^2 + y^2 = 16a^2$

(D) $x^2 + y^2 = 32a^2$

ANSWER **(d)** $x^2 + y^2 = 32a^2$

SOLUTION

Step 1 — find where the two parabolas meet. From $x^2 = 4ay$ we get $y = \frac{x^2}{4a}$. Substitute into $y^2 = 4ax$:

$$\left(\frac{x^2}{4a}\right)^2 = 4ax \Rightarrow \frac{x^4}{16a^2} = 4ax \Rightarrow x^4 = 64a^3x$$

$$x\left(x^3 - 64a^3\right) = 0 \Rightarrow x = 0 \text{ or } x = 4a$$

Step 2 — discard the origin. The circle is centred at the origin with **non-zero radius**, so it cannot pass through $(0, 0)$. Take $x = 4a$:

$$y = \frac{(4a)^2}{4a} = 4a \Rightarrow \text{the point is } (4a, 4a)$$

Step 3 — find the radius.

$$r^2 = (4a)^2 + (4a)^2 = 32a^2$$

$$x^2 + y^2 = 32a^2$$

Answer: (d) — $x^2 + y^2 = 32a^2$

Shortcut

These two parabolas are reflections of each other in $y = x$, so their non-origin intersection must lie **on** $y = x$. Set $y = x$ in either equation: $x^2 = 4ax$ gives $x = 4a$ at once, and then $r^2 = 2(4a)^2$. The "non-zero radius" clause exists purely to rule out the origin.

---

32 QA ARITHMETIC AVERAGES MIXTURE AND ALLIGATION 5 /10

The possible values of x in the set $\{1, 5, 13\}$ for which the mean of eight observations $5,\ 8,\ 3x + 2,\ 15,\ 27,\ 29,\ 36,\ 5x - 2$ equals their median are

(A) only 13

(B) 5 and 13

(C) only 5

(D) only 1

ANSWER **(b) 5 and 13**

SOLUTION

With only three candidates, test each.

Step 1 — the mean, in general. The fixed numbers $5, 8, 15, 27, 29, 36$ sum to 120, and the two variable ones add $(3x + 2) + (5x - 2) = 8x$:

$$\text{Mean} = \frac{120 + 8x}{8} = 15 + x$$

A pleasingly simple result — the mean is just $15 + x$.

Step 2 — test $x = 1$. Observations: $5, 8, 5, 15, 27, 29, 36, 3$. Sorted: $3, 5, 5, 8, 15, 27, 29, 36$.

$$\text{Median} = \frac{8 + 15}{2} = 11.5, \qquad \text{Mean} = 16 \quad \times$$

Step 3 — test $x = 5$. Observations: $5, 8, 17, 15, 27, 29, 36, 23$. Sorted: $5, 8, 15, 17, 23, 27, 29, 36$.

$$\text{Median} = \frac{17 + 23}{2} = 20, \qquad \text{Mean} = 20 \quad \checkmark$$

Step 4 — test $x = 13$. Observations: $5, 8, 41, 15, 27, 29, 36, 63$. Sorted: $5, 8, 15, 27, 29, 36, 41, 63$.

$$\text{Median} = \frac{27 + 29}{2} = 28, \qquad \text{Mean} = 28 \quad \checkmark$$

Answer: (b) — 5 and 13

Shortcut

Derive the mean once as $15 + x$ — then each test is just "sort eight numbers and average the middle two". Since two options claim "only", finding a second success immediately settles it.

---

33 QA ALGEBRA ALGEBRAIC IDENTITIES ●●●●●●●●○○ 8 /10

Positive reals x, y satisfy $x \neq y$ and $\frac{x^2+y^2}{xy} = k$. If replacing x by $x + y$ and y by $|x - y|$ leaves the value of k unchanged, then k equals

(A) 1 (B) $\sqrt{2}$

(C) 2 (D) $2\sqrt{2}$

ANSWER **(d)** $2\sqrt{2}$

SOLUTION

Step 1 — compute k after the replacement.

$$k_{\text{new}} = \frac{(x+y)^2 + (x-y)^2}{(x+y)\,|x-y|} = \frac{2x^2 + 2y^2}{|x^2 - y^2|}$$

using $(x+y)^2 + (x-y)^2 = 2(x^2+y^2)$ and $(x+y)\,|x-y| = |x^2 - y^2|$.

Step 2 — set it equal to the original k.

$$\frac{2(x^2+y^2)}{|x^2-y^2|} = \frac{x^2+y^2}{xy}$$

Cancel the common factor $x^2 + y^2$ (which is positive):

$$\frac{2}{|x^2-y^2|} = \frac{1}{xy} \;\Rightarrow\; |x^2 - y^2| = 2xy$$

Step 3 — convert to a single variable. Put $t = \frac{x}{y} > 0$ and divide by y^2:

$$|t^2 - 1| = 2t$$

Taking $t > 1$: $t^2 - 2t - 1 = 0 \Rightarrow t = 1 + \sqrt{2}$.

Step 4 — evaluate k. Note $k = \frac{x^2+y^2}{xy} = t + \frac{1}{t}$:

$$k = \left(1 + \sqrt{2}\right) + \frac{1}{1+\sqrt{2}} = \left(1 + \sqrt{2}\right) + \left(\sqrt{2} - 1\right) = 2\sqrt{2}$$

Answer: (d) — $2\sqrt{2}$

Shortcut

Spot early that $k = t + \frac{1}{t}$ where $t = x/y$ — then the whole problem lives in one variable. The identity $\frac{1}{1+\sqrt{2}} = \sqrt{2} - 1$ makes the last line instant. Note also $k \geq 2$ always, which kills options (a) and (b) on sight.

🎯 Not sure which topic is costing you marks? A topic-wise test tells you in 15 minutes. Find the gap

34 QA MODERN MATHS PERMUTATION AND COMBINATION ●●●●●●○○○○ 6 /10

The number of ways in which coins of denominations of rupees 2, 5 and 10 can be combined to make a value of rupees 50 is

(A) 19
(B) 20
(C) 10
(D) **21**

ANSWER (d) 21

SOLUTION

We need non-negative integers with

$2a + 5b + 10c = 50$

Step 1 — note a parity constraint. $2a$ and $10c$ are both even and 50 is even, so $5b$ must be even — meaning b is **even**. Write $b = 2b'$:

$2a + 10b' + 10c = 50 \Rightarrow a + 5b' + 5c = 25 \Rightarrow a = 25 - 5(b' + c)$

Step 2 — let $s = b' + c$. We need $a \geq 0$, so $s \leq 5$.

Step 3 — count. For each value of s, the pair (b', c) can be chosen in $s + 1$ ways:

s	ways
0	1
1	2
2	3
3	4
4	5
5	6

$1 + 2 + 3 + 4 + 5 + 6 = 21$

Answer: (d) — 21

Shortcut

The parity observation — that the number of 5-rupee coins must be even — halves the problem instantly. After the substitution it reduces to counting pairs summing to at most 5, which is the triangular number $\binom{7}{2} = 21$.

35 QA NUMBER SYSTEM PRIME NUMBERS AND CO-PRIMES 7 /10

If a, b, and c are three prime numbers such that $abc = 23\,(\,a+b+c\,)$, then the maximum possible value of $a+b-c$ is

(A) 33
(B) 46
(C) 28
(D) 25

ANSWER (a) 33

SOLUTION

Step 1 — use the fact that 23 is prime. Since 23 divides abc and all three are prime, **one of them must be 23**. Call the other two p and q.

Step 2 — simplify.

$23pq = 23\,(\,p+q+23\,) \;\Rightarrow\; pq = p+q+23$

Step 3 — factorise. Subtract $p+q$ and add 1 to both sides:

$pq-p-q+1 = 24 \;\Rightarrow\; (\,p-1\,)\,(\,q-1\,) = 24$

Step 4 — find prime pairs. Check each factorisation of 24:

$(\,p-1,\,q-1\,)$	$(\,p,\,q\,)$	both prime?
$(\,1,24\,)$	$(\,2,25\,)$	×
$(\,2,12\,)$	$(\,3,13\,)$	✓
$(\,3,8\,)$	$(\,4,9\,)$	×
$(\,4,6\,)$	$(\,5,7\,)$	✓

So the triple is $\{3,13,23\}$ or $\{5,7,23\}$.

Step 5 — maximise $a+b-c$. Make c the **smallest** member:

- $\{3,13,23\}$: $13+23-3 = 33$
- $\{5,7,23\}$: $7+23-5 = 25$

$\max = 33$

Answer: (a) — 33

Shortcut

Two moves win it: 23 must be one of the primes, and $pq-p-q = 23$ begs to be written $(\,p-1\,)\,(\,q-1\,) = 24$. Then remember $a+b-c$ is **not** symmetric — assign the smallest prime to c to maximise it.

The number of integer solutions (x, y) of the inequality $x^2 + y^2 \leq 10$ is

(A) 12
(B) 13
(C) 36
(D) **37**

ANSWER (d) 37

SOLUTION

We are counting lattice points inside or on a circle of radius $\sqrt{10} \approx 3.16$.

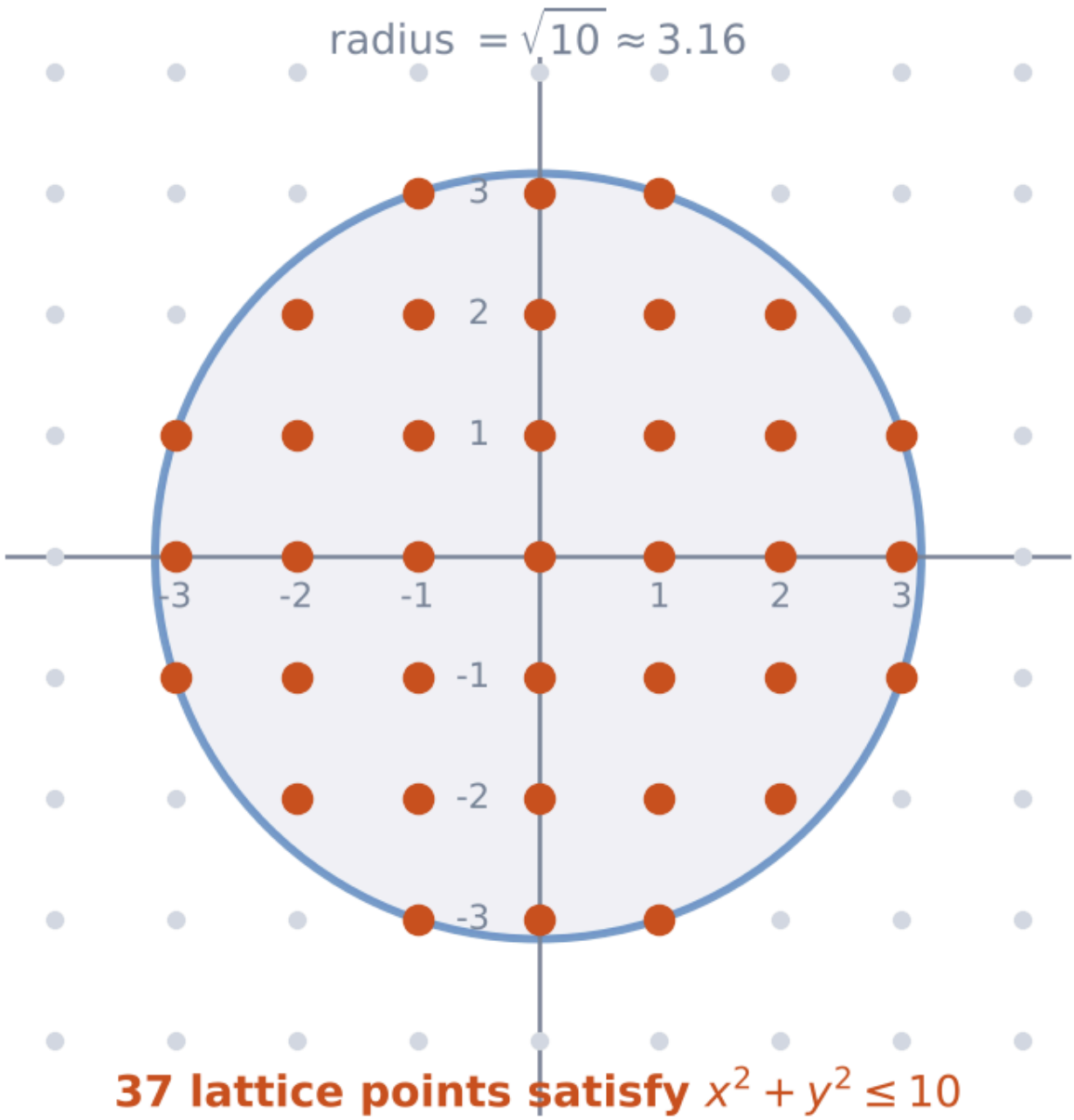
Step 1 — note the range. Since $x^2 \leq 10$, we have $-3 \leq x \leq 3$, and the same for y.

Step 2 — count row by row. For each x, find how many y satisfy $y^2 \leq 10 - x^2$:

x	$10 - x^2$	allowed y	count
0	10	$-3 \ldots 3$	7
± 1	9	$-3 \ldots 3$	7 each
± 2	6	$-2 \ldots 2$	5 each
± 3	1	$-1 \ldots 1$	3 each

Step 3 — add up.

$7 + 2(7) + 2(5) + 2(3) = 7 + 14 + 10 + 6 = 37$



Answer: (d) — 37

Shortcut

Count by columns and exploit symmetry — only $x = 0, 1, 2, 3$ need any thought, and everything but $x = 0$ doubles. The trap is forgetting that $x = \pm 3$ still works, since $9 \leq 10$ leaves room for $y \in \{-1, 0, 1\}$.

37 QA ALGEBRA LOGARITHMS

7 /10

If $\log_{18} 24 = p$, then $\log_{96} 108$ equals

(A) $\frac{3p+3}{3p+2}$

(B) $\frac{p+7}{9p-2}$

(C) $\frac{p+2}{7p-3}$

(D) $\frac{3p+2}{3p+1}$

ANSWER (b) $\frac{p+7}{9p-2}$

SOLUTION

Step 1 — move everything to one base. Work in base 2 and write $t = \log_2 3$.

$$\log_{18} 24 = \frac{\log_2 24}{\log_2 18}$$

Since $24 = 2^3 \cdot 3$ and $18 = 2 \cdot 3^2$:

$$p = \frac{3+t}{1+2t}$$

Step 2 — solve for t.

$$3 + t = p + 2pt \;\Rightarrow\; t\,(1-2p) = p - 3 \;\Rightarrow\; t = \frac{p-3}{1-2p}$$

Step 3 — express the target the same way. Since $108 = 2^2 \cdot 3^3$ and $96 = 2^5 \cdot 3$:

$$\log_{96} 108 = \frac{2+3t}{5+t}$$

Step 4 — substitute.

$$\text{numerator} = 2 + \frac{3\,(p-3)}{1-2p} = \frac{2-4p+3p-9}{1-2p} = \frac{-p-7}{1-2p}$$

$$\text{denominator} = 5 + \frac{p-3}{1-2p} = \frac{5-10p+p-3}{1-2p} = \frac{2-9p}{1-2p}$$

$$\log_{96} 108 = \frac{-p-7}{2-9p} = \frac{p+7}{9p-2}$$

Answer: (b) — $\frac{p+7}{9p-2}$

Shortcut

Reduce every number to $2^x 3^y$ and let $t = \log_2 3$ carry the whole question — then it is ordinary algebra. If you are short of time, take $p = \log_{18} 24 \approx 1.0995$ on the calculator-free estimate $\log_2 3 \approx 1.585$ and test the options numerically; only one lands near $\log_{96} 108 \approx 1.0256$.

38 QA MODERN MATHS SET THEORY AND VENN DIAGRAMS 6 /10

Let $S = \{1, 2, ..., 180\}$. Define A as the set of all multiples of 4 in S, B as the set of all multiples of 6 in S, and C as the set of all multiples of 9 in S. The number of elements in S that belong to exactly one of A, B, C is

(A) 50
(B) 48
(C) 44
(D) 40

ANSWER (a) 50

SOLUTION

Step 1 — sizes of the three sets.

$$|A| = \frac{180}{4} = 45, \qquad |B| = \frac{180}{6} = 30, \qquad |C| = \frac{180}{9} = 20$$

Step 2 — the pairwise overlaps, using lcms:

$$|A \cap B| = \frac{180}{lcm\ (\ 4, 6\ )} = \frac{180}{12} = 15$$

$$|B \cap C| = \frac{180}{lcm\ (\ 6, 9\ )} = \frac{180}{18} = 10$$

$$|A \cap C| = \frac{180}{lcm\ (\ 4, 9\ )} = \frac{180}{36} = 5$$

Step 3 — the triple overlap.

$$|A \cap B \cap C| = \frac{180}{lcm\ (\ 4, 6, 9\ )} = \frac{180}{36} = 5$$

Step 4 — apply the "exactly one" formula.

$$\sum |A| - 2\sum |A \cap B| + 3|A \cap B \cap C|$$
$$= (\ 45 + 30 + 20\ ) - 2\ (\ 15 + 10 + 5\ ) + 3\ (\ 5\ )$$
$$= 95 - 60 + 15 = 50$$

Answer: (a) — 50

Shortcut

Memorise the **exactly one** formula: singles $-2\times$ pairs $+3\times$ triple. Deriving it mid-exam costs minutes. Watch that $lcm\ (\ 4, 9\ ) = lcm\ (\ 4, 6, 9\ ) = 36$ here, so two of the counts coincide.

39 QA NUMBER SYSTEM DIVISIBILITY RULES ●●●●●○○○○○ 5 /10

If m is a positive integer then the values of k for which $6m + k$ cannot be a perfect square are

(A) 2 and 5
(B) 3 and 4
(C) 1 and 5
(D) 1, 2 and 5

ANSWER (a) 2 and 5

SOLUTION

Step 1 — ask what squares look like modulo 6. Square every residue:

$n \bmod 6$	0	1	2	3	4	5
$n^2 \bmod 6$	0	1	4	3	4	1

So a perfect square is always congruent to $0, 1, 3$ or 4 modulo 6 — **never 2 and never 5**.

Step 2 — apply it. $6m + k \equiv k \ (\bmod 6)$, so $6m + k$ can only be a perfect square if $k \in \{0, 1, 3, 4\}$.

Therefore it **cannot** be a square when

$k = 2$ or $k = 5$

Answer: (a) — 2 and 5

Shortcut

Build the table of squares mod 6 once — it is six quick calculations and it answers the whole question. The same trick (squares mod 4 are 0 or 1; mod 8 are 0, 1 or 4) resolves a large family of IPMAT number-system questions.

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40 QA MODERN MATHS PROBABILITY ●●●●○○○○○○ 4 /10

A fair die is rolled repeatedly. The probability that the cumulative sum is at least 17 in the third trial is

(A) $\frac{1}{108}$
(B) $\frac{7}{216}$
(C) $\frac{1}{54}$
(D) $\frac{1}{27}$

ANSWER (c) $\frac{1}{54}$

SOLUTION

Step 1 — understand the ceiling. Three rolls give a maximum of $6 + 6 + 6 = 18$, so "at least 17" means the sum is **17 or 18**.

Step 2 — count the favourable outcomes.

Sum 18: only $(6, 6, 6)$ — **1** way.

Sum 17: the multiset must be $\{6, 6, 5\}$, which can be ordered in $\frac{3!}{2!} = 3$ ways — **3** ways.

Total favourable $= 1 + 3 = 4$

Step 3 — divide by the sample space.

$$P = \frac{4}{216} = \frac{1}{54}$$

Answer: (c) — $\frac{1}{54}$

Shortcut

Count downward from the maximum, not upward from 17 — only two sums are possible, and each has an obvious shape. The distractor $\frac{7}{216}$ belongs to "at least 16".

---

41 DILR DATA INTERPRETATION TABLES ●●●●●●○○○○ 6 /10

When one serving of each of the five items is included in the diet plan, the nutrient with the least percentage of MDR satisfied is

(A) **Protein with 65% MDR**
(B) Calcium with 65% MDR
(C) Calcium with 70% MDR
(D) Protein with 70% MDR

ANSWER **(a) Protein with 65% MDR**

SOLUTION

Step 1 — total each nutrient across one serving of all five items.

$\text{Calcium} = 300 + 90 + 210 + 120 + 50 = 770 \text{ mg}$
$\text{Iron} = 0 + 6 + 4 + 3 + 1 = 14 \text{ mg}$
$\text{Protein} = 8 + 3 + 6 + 5 + 4 = 26 \text{ g}$

Step 2 — convert each to a percentage of its MDR.

Nutrient	Total	MDR	% of MDR
Calcium	770	1100	70%
Iron	14	15	93.3%
Protein	**26**	**40**	$\mathbf{65\%}$

Step 3 — pick the smallest. Protein, at 65%.

Answer: (a) — Protein with 65% MDR

Shortcut

Only two options are even internally consistent — Calcium is $770/1100 = 70\%$ and Protein is $26/40 = 65\%$, so options (b) and (d) are wrong on their own numbers. That leaves comparing 65% against 70%.

Refers to the DI set above.

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42 DILR DATA INTERPRETATION TABLES 6 /10

If only x servings of Milk and y servings of Rice are included in the diet plan, then the minimum value of $x + y$ that will satisfy the MDR of all three nutrients is

(A) 24
(B) **17**
(C) 15
(D) 22

ANSWER (b) 17

SOLUTION

Step 1 — write the three requirements. Milk gives $(300, 0, 8)$ and Rice gives $(50, 1, 4)$ per serving:

Calcium: $300x + 50y \geq 1100$
Iron: $0x + 1y \geq 15$
Protein: $8x + 4y \geq 40$

Step 2 — the iron row decides y immediately. Milk contains **no** iron, so all 15 mg must come from rice:

$y \geq 15$

Step 3 — now use calcium. With $y = 15$:

$300x + 750 \geq 1100 \Rightarrow 300x \geq 350 \Rightarrow x \geq 1.17 \Rightarrow x = 2$

(servings must be whole numbers)

Step 4 — check protein.

$8(2) + 4(15) = 16 + 60 = 76 \geq 40$ ✓

Step 5 — total.

$x + y = 2 + 15 = 17$

Worth noting: $(x, y) = (1, 16)$ also works and also totals 17 — calcium comes to exactly $300 + 800 = 1100$. Either way the minimum is **17**.

Answer: (b) — 17

Shortcut

Milk's zero in the iron column is the whole question: it forces $y \geq 15$ before you look at anything else. Then calcium needs only one or two servings of milk, and protein is never binding.

Refers to the DI set above.

📖 Reading comprehension improves with daily practice, not last-minute revision. Start Daily Reads

43 DILR DATA INTERPRETATION TABLES 6 /10

The number of food items that can satisfy at least 15% of the MDR for at least two nutrients in one serving is

A 2
B 0
C 3
D 1

ANSWER (a) 2

SOLUTION

Step 1 — work out the 15% thresholds.

Calcium: $0.15 \times 1100 = 165$ mg
Iron: $0.15 \times 15 = 2.25$ mg
Protein: $0.15 \times 40 = 6$ g

Step 2 — test each food item against all three.

Item	Ca ≥ 165	Fe ≥ 2.25	Protein ≥ 6	Count
Milk (300, 0, 8)	✓	×	✓	**2**
Spinach (90, 6, 3)	×	✓	×	1
Almonds (210, 4, 6)	✓	✓	✓	**3**
Oats (120, 3, 5)	×	✓	×	1
Rice (50, 1, 4)	×	×	×	0

Step 3 — count those reaching at least two. Milk and Almonds.

2

Answer: (a) — 2

Shortcut

Compute the three thresholds once (165, 2.25, 6) and then it is pure table-scanning. Almonds clears all three; Milk clears two; nothing else manages more than one. Note protein for Almonds is exactly 6 — "at least" means it counts.

Refers to the DI set above.

44 DILR DATA INTERPRETATION TABLES 6 /10

The food item(s) that can satisfy at least half of the MDR for all the three nutrients using up to seven servings of that single item alone is

(A) Only Almonds, and Oats

(B) **Only Almonds, Spinach, and Oats**

(C) Only Almonds

(D) Only Almonds, and Spinach

ANSWER **(b) Only Almonds, Spinach, and Oats**

SOLUTION

Step 1 — half the MDR.

Calcium 550, Iron 7.5, Protein 20

Step 2 — multiply each item by the maximum 7 servings and test all three.

Item × 7	Calcium	Iron	Protein	All three?
Milk	2100 ✓	**0 ×**	56 ✓	×
Spinach	630 ✓	42 ✓	21 ✓	✓
Almonds	1470 ✓	28 ✓	42 ✓	✓
Oats	840 ✓	21 ✓	35 ✓	✓
Rice	**350 ×**	7 ×	28 ✓	×

Step 3 — read off. Spinach, Almonds and Oats all manage it.

Milk fails only on iron (it has none), and Rice fails on calcium and iron.

Answer: (b) — Only Almonds, Spinach, and Oats

Shortcut

Test the **weakest** nutrient of each item first and you can reject fast: milk dies on iron (zero), rice on calcium ($7 \times 50 = 350 < 550$). Spinach looks weak on protein but $7 \times 3 = 21$ just clears 20 — that near-miss is the question's trap.

Refers to the DI set above.

45 DILR DATA INTERPRETATION TABLES 6 /10

If two servings of Milk are part of the daily diet plan, then the minimum number of servings of any other single item that can satisfy the MDR of all three nutrients is

(A) 7
(B) 5
(C) **4**
(D) 6

ANSWER (c) 4

SOLUTION

Step 1 — what the two milk servings provide.

$2 \times (300,\ 0,\ 8) = (600 \text{ mg Ca},\ 0 \text{ mg Fe},\ 16 \text{ g protein})$

Step 2 — the shortfall against the MDR.

Calcium: $1100 - 600 = 500$ Iron: $15 - 0 = 15$ Protein: $40 - 16 = 24$

Step 3 — for each remaining item, find how many servings k clear all three.

Item	Ca: $k \geq 500/\text{Ca}$	Fe: $k \geq 15/\text{Fe}$	Protein: $k \geq 24/\text{P}$	k needed
Spinach (90,6,3)	5.56 → 6	2.5 → 3	8	**8**
Almonds (210,4,6)	2.38 → 3	3.75 → 4	4	**4**
Oats (120,3,5)	4.17 → 5	5	4.8 → 5	**5**
Rice (50,1,4)	10	15	6	**15**

Each item needs the **largest** of its three requirements, rounded up.

Step 4 — take the smallest across items. Almonds, with 4 servings.

Answer: (c) — 4

Shortcut

Milk contributes no iron, so whichever item you choose must supply all 15 mg — that alone rules Rice out. Almonds is the obvious candidate (best iron-per-serving among the calcium-rich items), and checking it first gives 4 immediately.

COMMON DATA SET

Nutritionist's diet plan – Calcium, Iron and Protein

A nutritionist is designing a daily diet plan of a person using five food items: Milk, Spinach, Almonds, Oats, and Rice. The Minimum Daily Requirement (MDR) of the nutrients Calcium, Iron and Protein should be 1100 mg, 15 mg, and 40 g, respectively. The following table gives nutrient content per serving of each food item:

Food item	Calcium (mg)	Iron (mg)	Protein (g)
Milk	300	0	8
Spinach	90	6	3
Almonds	210	4	6
Oats	120	3	5
Rice	50	1	4

Each serving provides a certain percentage of the MDR. For example, one serving of milk satisfies 20% of MDR of Protein. Further, the number of servings of any food item should be a whole number.

FIX THE WEAK AREA

One weak topic at a time

Algebra alone carries the largest share of the quant in this paper. Instead of re-attempting whole mocks, pick a single topic, take a short timed test on it, and watch the accuracy move.

Topic-wise tests →

All IPMAT practice

SECTION 3

VARC

Verbal Ability and Reading Comprehension

45	180	40 min	+4 / −1 / 0
QUESTIONS	MARKS	SECTIONAL LIMIT	MARKING

MCQ (+ 5 TITA para jumbles)

MOST ASKED HERE — Reading Comprehension - Question Types **18** · Verbal Ability **15** · Vocabulary **9** · Grammar **3**

46

VARC · READING COMPREHENSION - QUESTION TYPES · RC DETAIL AND FACT BASED QUESTIONS

6 /10

The narrator observed that the two dogs, Pug and Gyp that belonged to the family

(A) communicated with each other about everything.

(B) romped and foraged together in the yard.

(C) **played with each other and hunted together.**

(D) thought much about each other throughout the day.

ANSWER (c) played with each other and hunted together.

SOLUTION

Where the passage says it. Paragraph 2: the dogs "thought much of each other when **romping together in the yard, or in foraging the neighbouring woods and fields for rabbits and groundhogs**."

Romping is play; foraging for rabbits and groundhogs is hunting. Option (c) captures both halves.

Why the others fail:

- **(a)** "about everything" overstates it — the passage describes planning hunting expeditions, not communication on every subject.
- **(b)** is the trap: it takes *romped* and *foraged* but confines both to the yard. The passage puts the foraging in "the neighbouring woods and fields".
- **(d)** misreads the idiom. "Thought much of each other" means they were fond of each other, not that they thought *about* each other all day.

Answer: (c)

Shortcut

Two options are near-misses built from the passage's own words — the discriminator is **location** (yard vs woods and fields) in (b) and the idiom *think much of* in (d). When options recycle the text's vocabulary, check scope and idiom, not keywords.

Refers to the RC set above.

47 VARC READING COMPREHENSION - QUESTION TYPES RC INFERENCE QUESTIONS ●●●●●●○○○○ 6 /10

The cry of warning from a bird or animal

(A) could be that of a dog, crow, jay or magpie.

(B) makes the sportsman realise that he has lost his only chance of a shot.

(C) **is distinct enough for several species to interpret correctly.**

(D) is an expression of fear of humans and predators

ANSWER **(c) is distinct enough for several species to interpret correctly.**

SOLUTION

Where the passage says it. The passage describes "a sort of animal lingua franca, which is common to all. A cry of warning, no matter from what bird or animal it emanates, **is understood by them all**."

It then gives the rooster's hawk-warning, which every bird of garden, orchard and barnyard understands. That is precisely "distinct enough for several species to interpret correctly".

Why the others fail:

- **(a)** lists species but misses the point, which is about *comprehension across* species, not who makes the sound. The dog is also not given as an alarm-caller.
- **(b)** inverts cause and effect. The sportsman loses his shot *because* the game understood the warning; the cry does not exist to inform him.
- **(d)** narrows it to fear of humans and predators, while the passage frames it as a general warning system.

Answer: (c)

Shortcut

The key phrase is "**understood by them all**" — look for the option about cross-species comprehension. Option (b) is a detail from the same sentence repurposed into a wrong claim, which is the commonest RC trap.

Refers to the RC set above.

48 VARC READING COMPREHENSION - QUESTION TYPES RC INFERENCE QUESTIONS 6 /10

The author had observed the dogs' interchange of ideas several times and felt that they communicated

(A) with their heads in close contiguity for two or three minutes.

(B) the direction each dog would take and what each would do.

(C) **with an understanding beyond words and sounds.**

(D) via sounds inaudible to humans and gestures that one could not understand.

ANSWER **(c) with an understanding beyond words and sounds.**

SOLUTION

Where the passage says it. "There were **no audible utterances, no visible gestures**, yet there was an interchange of ideas. Through the medium of the eye were the thoughts conveyed. It was spirit speaking directly to spirit, conveying by a single glance of the eye thoughts which whole volumes would fail to express."

"Beyond words and sounds" is exactly that.

Why the others fail:

- **(a)** describes the *posture* they adopted, not what was communicated or how.
- **(b)** is what the author *infers* they planned, but the question asks **how** they communicated.
- **(d)** directly contradicts the text — the passage insists there were no sounds and no gestures at all, not that they were merely imperceptible.

Answer: (c)

Shortcut

Option (d) is the near-identical opposite: the passage says there were *no* sounds or gestures, (d) says there *were*, only undetectable ones. Whenever an option adds a qualifier the text never uses ("inaudible", "could not understand"), suspect it.

Refers to the RC set above.

49 VARC READING COMPREHENSION - QUESTION TYPES

RC DETAIL AND FACT BASED QUESTIONS

6 /10

The war between the robins and the sparrows ended when

(A) the brethren of the sparrow flocked to the defence against the alien.

(B) **the robins who were getting the better of the two parties also got help from several other birds.**

(C) the sparrows communicated with an ear-piercing harangue for which they are particularly noted.

(D) more than a score of robins in the immediate vicinity chased away the sparrows.

ANSWER **(b) the robins who were getting the better of the two parties also got help from several other birds.**

SOLUTION

Follow the sequence in the last paragraph. The robins were winning; the sparrows called for help and "more than a score of friends" came; **but** that same war cry "was equally understood by all the other birds of the neighbourhood, who flocked to the defence of their brethren against the alien" — that is, against the *sparrows*. The sparrows then "were forced to seek safety in retreat."

So the battle ended because the robins, already winning, received reinforcements from the other native birds.

Why the others fail:

- **(a)** reverses who the "alien" is. In the passage the English sparrow is the alien; the other birds defended the robins *against* it.
- **(c)** describes the sparrows' call for help — an earlier step, not the ending.
- **(d)** invents a number. "More than a score" referred to the sparrows' friends, not robins.

Answer: (b)

Shortcut

The whole question turns on one word: **alien**. Paragraph 3 establishes the English sparrow as the non-native species, so "defence of their brethren against the alien" means the birds sided with the robins. Options (a) and (d) both get that backwards.

Refers to the RC set above.

50 VARC READING COMPREHENSION - QUESTION TYPES RC VOCABULARY IN CONTEXT 6 /10

The term lingua franca refers to a language which

(A) humans cannot learn or understand.

(B) is widely spoken in France.

(C) is used by all birds and animals to communicate within their species.

(D) **is the common one for people with different native languages.**

ANSWER **(d) is the common one for people with different native languages.**

SOLUTION

The definition is given in the sentence itself. "Each species of animal has its own **dialect**. Yet there is another language, a sort of animal lingua franca, **which is common to all**."

The contrast is explicit: a *dialect* belongs to one species, a *lingua franca* is shared **across** them. Option (d) states the standard meaning — a common language bridging different native tongues.

Why the others fail:

- **(b)** is a pure vocabulary trap on the word "franca".
- **(c)** is the opposite of the passage's contrast: communicating *within* a species is the dialect, not the lingua franca.
- **(a)** adds a claim about humans that the passage never makes.

Answer: (d)

Shortcut

The sentence before the term defines it by contrast — *dialect* (within a species) versus *lingua franca* (across them). Option (c) is deliberately built from the wrong half of that contrast; the "France" option is the giveaway distractor.

Refers to the RC set above.

51 VARC READING COMPREHENSION - QUESTION TYPES

RC DETAIL AND FACT BASED QUESTIONS

6 /10

According to the passage, the English sparrow is quarrelsome, pugnacious and it

(A) is as useful as a robin, bluebird or martin.

(B) is a native species driven to fight for its rights.

(C) seeks quarters in the rural districts which other birds do not infect.

(D) **occupies whatever space it can find to bring up its young ones.**

ANSWER **(d) occupies whatever space it can find to bring up its young ones.**

SOLUTION

Where the passage says it. "It **appropriates every available locality for nesting purposes**, and our native species are driven to the necessity of fighting for their rights, or of seeking quarters in the rural districts which these birds do not infect."

Appropriating every available nesting locality is exactly "occupies whatever space it can find to bring up its young ones" — nesting being for the young.

Why the others fail — each one swaps the subject:

- **(a)** The passage calls the robin, bluebird and martin "useful" and says they are *driven out* by the sparrow. The sparrow is not among the useful ones.
- **(b)** It is the **native** species that must fight for their rights; the sparrow is the intruder.
- **(c)** Again reversed: it is the native birds who seek the rural districts the sparrows do not infest.

Answer: (d)

Shortcut

Three of the four options describe the **native** birds, not the sparrow. One sentence in the passage contains all these phrases, so read it carefully and ask of each option: *whose* behaviour is this? That single check eliminates (a), (b) and (c).

READING PASSAGE

Passage 1 – Animal communication: Pug, Gyp and the sparrows

Who has not often observed two dogs, members of the same household, communicating with each other? Pug and Gyp were two animals that belonged to the family where I spent a summer vacation.

They thought much of each other when romping together in the yard, or in foraging the neighbouring woods and fields for rabbits and groundhogs. Never would they start out on an expedition for game without having previously laid their plans. It was interesting and amusing to watch them. They would bring their heads into close contiguity, remaining in this position for two or three minutes, when, by mutual consent, they would separate, look each other in the eyes, and then start off in different directions for the scene of their projected enterprise. Times out of number I have observed such behaviour and have always discovered that they meant something of the kind. There were no audible utterances, no visible gestures, yet there was an interchange of ideas. Through the medium of the eye were the thoughts conveyed. It was spirit speaking directly to spirit, conveying by a single glance of the eye thoughts which whole volumes would fail to express. Each species of animal has its own dialect. Yet there is another language, a sort of animal lingua franca, which is common to all. A cry of warning, no matter from what bird or animal it emanates, is understood by them all, as is well known to many a sportsman who has lost his only chance of a shot by reason of an impertinent crow, jay or magpie which has espied him, and has given its cry of alarm. There is not a bird of garden or orchard, or a fowl of the barnyard or door-side, that does not understand the peculiar cry of the rooster when a hawk is seen careering overhead or perched upon the summit of a nearby tree. With one accord they flee to their coverts, and there remain until the danger is past.

No more quarrelsome and pugnacious species of bird exists than the English sparrow. It appropriates every available locality for nesting purposes, and our native species are driven to the necessity of fighting for their rights, or of seeking quarters in the rural districts which these birds do not infect. Thus, it is that many a useful robin, bluebird or martin is driven from our midst. Many have witnessed encounters between these birds and the robins. The author once saw a contest between a pair of sparrows and a pair of robins for the possession of a certain tree that grew in his yard. Now the robin, single-handed, is more than a match for a sparrow.

In the engagement referred to, the robins were getting the better of the sparrows, which the latter were not slow in perceiving. Instantly the sparrows set up the wild, ear-piercing harangue for which they are peculiarly noted, when more than a score of friends from the immediate vicinity gathered to their assistance. But the war cry which they sounded not only summoned help to their standard, but it was equally understood by all the other birds of the neighbourhood, who flocked to the defence of their brethren against the alien. The battle waged warm and fiercely for some minutes, when the sparrows were forced to seek safety in retreat.

52 VARC | READING COMPREHENSION - QUESTION TYPES | CONCEPT A/ PHRASE MEANING

6 /10

The reference to David and Goliath suggests that

(A) if powerful forces are defeated, they will revive.

(B) actions that seem unnecessary can be successful.

(C) resistance to large negative forces fails.

(D) **the seemingly weak can succeed in unequal fights.**

ANSWER **(d) the seemingly weak can succeed in unequal fights.**

SOLUTION

Where the passage says it. Paragraph 3: "If you block the accounts that most inflame you, you deprive them of your attention... Blocking even hurts them with the algorithm. **David did defeat Goliath.**"

The allusion follows a description of one small act by an individual user against vast platforms. Its point is that the far weaker party can still win.

Why the others fail:

- **(a)** adds a revival the passage never mentions.
- **(b)** misses the contrast. The passage's point is not that blocking *seems unnecessary*, but that it seems *too small to matter*.
- **(c)** states the opposite of the allusion's purpose; the passage is encouraging resistance, not dismissing it.

Answer: (d)

Shortcut

Allusion questions are answered by what the allusion is *doing* in the argument, not by the Bible story. Here it caps a paragraph urging individual action, so the answer must be optimistic — which immediately removes (c).

Refers to the RC set above.

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53 VARC | READING COMPREHENSION - QUESTION TYPES | RC DETAIL AND FACT BASED QUESTIONS

6 /10

The author is of the opinion that

(A) the response of users does not vary according to the media consumed.

(B) the reaction of users cannot be controlled by media.

(C) **reading responsible media reports promotes thoughtfulness.**

(D) social media reports more widely and responsibly.

ANSWER **(c) reading responsible media reports promotes thoughtfulness.**

SOLUTION

Where the passage says it. Paragraph 2: "**Reading responsible accounts** of pollution, a terror attack, an election result etc. would give you **food for thought**. On social media, you would be targeted with stuff doctored to send you into troll mode."

"Food for thought" is thoughtfulness; the contrast with social media is explicit.

Why the others fail:

- **(a)** is contradicted by that very contrast — the whole paragraph shows response *does* vary with the medium.
- **(b)** is the reverse of the passage's thesis, which is that algorithms shape user reactions deliberately.
- **(d)** inverts the comparison: it is the newspaper, not social media, that is described as responsible.

Answer: (c)

Shortcut

The paragraph is built on one contrast — newspaper versus feed. Options (a), (b) and (d) each deny or reverse that contrast, so the one that preserves it must be right.

Refers to the RC set above.

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54 VARC READING COMPREHENSION - QUESTION TYPES

RC DETAIL AND FACT BASED QUESTIONS

6 /10

The rage bait problem can be addressed by

(A) **blocking sites that propagate inflammatory content.**

(B) turning one's attention more closely to hateful propaganda.

(C) algohacking content that is designed to produce anger.

(D) consuming more news on social media.

ANSWER **(a) blocking sites that propagate inflammatory content.**

SOLUTION

Where the passage says it. Paragraph 3 gives the remedy in plain terms: "**If you block the accounts that most inflame you**, you deprive them of your attention, you refuse to buy the hate they are selling. Blocking even hurts them with the algorithm."

Why the others fail:

- **(b)** is the opposite of depriving them of attention.
- **(c)** borrows the passage's own coinage — "the **algohacking** of our brains" — but that describes the *disease*, not the cure. The passage never proposes algohacking anything.
- **(d)** would worsen the problem the passage describes.

Answer: (a)

Shortcut

Watch option (c): it reuses a striking word from paragraph 1 ("algohacking") in the wrong role. Distinctive coinages are often recycled as traps — check whether the passage used the term for the problem or the solution.

Refers to the RC set above.

✏ Para jumbles and para summary sets, timed or untimed, with full explanations. RC Practice

55 VARC READING COMPREHENSION - QUESTION TYPES CONCEPT A/ PHRASE MEANING 6 /10

The phrase "a civilisational battle" could best be interpreted as a conflict that affects

(A) the outward forms of social beliefs and behaviour.

(B) **the existential foundations of a society.**

(C) a change into a new and better type of society.

(D) a battle of classes within society.

ANSWER **(b) the existential foundations of a society.**

SOLUTION

Where the passage says it. Paragraph 4: "And make no mistake, this is a civilisational battle. We must fight against the **atrophy of our attention**, its capture by the most terrible types of things that human nature can be drawn to, and to **regain our sense and sensibility**."

Attention, human nature, sense and sensibility — these are foundational human capacities, not surface customs. Calling it *civilisational* raises the stakes to what a society fundamentally is.

Why the others fail:

- **(a)** reduces it to outward forms, the opposite of foundational.
- **(c)** suggests progress towards something better; the passage fears loss, not transformation.
- **(d)** imports class conflict, a theme entirely absent.

Answer: (b)

Shortcut

Gauge the **register** of the surrounding words. "Atrophy", "human nature", "sense and sensibility" are all deep-level terms, so the answer must be the deepest-level option. (a) is too shallow and (d) too specific.

Refers to the RC set above.

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56 VARC READING COMPREHENSION - QUESTION TYPES CAUSE & EXPLANATION 6 /10

According to the author, rage bait works when

(A) users actively chase news content that conforms to their political biases.

(B) reading responsible accounts of pollution, terror or elections provides social media users food for thought.

(C) social media content fuels public anger to bring about constructive social change.

(D) **tech platforms deliberately supply distorted content that incentivises hate.**

ANSWER **(d) tech platforms deliberately supply distorted content that incentivises hate.**

SOLUTION

Where the passage says it. Paragraph 2: "Once tech platforms figured out how this kind of content spirals user engagement, **the algorithms got tweaked to feed us more and more of the same, activating a diabolical incentive structure of hate**. Of course, in this swamp, reality is completely distorted."

Deliberate supply (tweaked algorithms), distortion, and an incentive structure of hate — option (d) matches all three elements.

Why the others fail:

- **(a)** puts the agency on users actively seeking content. The passage describes content being *pushed* at them: "you would be **targeted** with stuff doctored to send you into troll mode."
- **(b)** describes the newspaper experience, which the passage offers as the *contrast* to rage bait.
- **(c)** claims constructive social change, while the passage calls the result "pure poison".

Answer: (d)

Shortcut

Ask who is doing the pushing. The passage is consistently about platforms acting on users, not users choosing — which kills (a) at once. (b) is lifted verbatim from the passage but describes the opposite case, a classic misdirection.

Refers to the RC set above.

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57 VARC READING COMPREHENSION - QUESTION TYPES RC EXCEPT AND NOT QUESTIONS ●●●●●●○○○○ 6 /10

The writer states all of the following except:

(A) **Anger has no useful purpose as it has no outcome.**

(B) Anger has been used by companies to gain monetary benefits.

(C) Misuse of anger can negatively impact general wellbeing.

(D) Constant anger has a function in certain situations.

ANSWER **(a) Anger has no useful purpose as it has no outcome.**

SOLUTION

An EXCEPT question — three options are supported, one is not. Check each against paragraph 1.

- **(b)** ✓ "Some companies and individuals **draw colossal profits** from it."
- **(c)** ✓ "...but at **terrible cost to general well-being**."
- **(d)** ✓ "Anger **can be a useful emotion**. It can play a key role in building a strong individual psyche, as also a just society."
- **(a)** × This flatly contradicts the opening line. The passage's very first sentence grants anger a useful purpose.

Answer: (a)

Shortcut

The first sentence of the passage — "Anger **can** be a useful emotion" — settles this on its own, since (a) denies it outright. In EXCEPT questions, look first for the option that reverses something the passage states plainly.

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58 VARC VOCABULARY IDIOMS AND PHRASES 3 /10

Complete the following sentence by choosing the most appropriate word/phrase from the options given below.

The rich businessman bought a luxury duplex apartment that must have cost a/an_____.

(A) large bushelful
(B) incredulous bombshell
(C) **arm and a leg**
(D) entire legacy

ANSWER **(c) arm and a leg**

SOLUTION

What the sentence needs. An idiom meaning **extremely expensive**.

The idiom. *Cost an arm and a leg* = to be very costly. It is the standard fixed expression and fits a luxury apartment exactly.

Why the others fail:

- **large bushelful** — a bushel is a unit of volume for grain; it is not an idiom for price.
- **incredulous bombshell** — *incredulous* describes a person who cannot believe something (the word for the thing itself is *incredible*), and the phrase is not English.
- **entire legacy** — grammatically possible but not an idiom, and "a/an" before it reads awkwardly.

Answer: (c) — arm and a leg

Shortcut

The article "a/an" before the blank signals a fixed noun phrase. Only one of the four is a real English idiom — recognising *cost an arm and a leg* ends the question instantly.

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59 VARC VOCABULARY COMMONLY CONFUSED WORDS 6 /10

Complete the following sentence by choosing the most appropriate word/phrase from the options given below.

The journal published unverified details about the company's lack of business_____.

(A) and this report on the business was calamitous
(B) and this report on the business was careless
(C) and this report on the business was callous
(D) **and this report on the business was calumnious**

ANSWER **(d) and this report on the business was calumnious**

SOLUTION

What the sentence needs. The journal published **unverified** — that is, unsubstantiated and damaging — claims about a company. The precise word for a false and defamatory statement is needed.

The word set:

Word	Meaning
calumnious	slanderous; making false and damaging statements ✓
calamitous	disastrous, causing great harm
callous	emotionally insensitive, unfeeling
careless	negligent, inattentive

Why the others fail. *Careless* and *calamitous* are both defensible in a loose sense, but neither captures the key fact that the details were **unverified** — that is, potentially false and defamatory. *Callous* describes a lack of feeling, which is not what publishing false claims about a company amounts to.

Answer: (d) — calumnious

Shortcut

Four near-homophones beginning *cal-/car-* — the discriminator is the word **unverified** in the stem. Unverified damaging claims = slander = *calumnious*. Pick the option that responds to the stem's own signal word.

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60 VARC VOCABULARY IDIOMS AND PHRASES ●●●●○○○○○○ 4 /10

Complete the following sentence by choosing the most appropriate word/phrase from the options given below.

We had tried so hard to keep Maya's birthday party a surprise, but at the last minute someone_____.

(A) played cat and mouse with her

(B) **let the cat out of the bag**

(C) sent the cat out of the house

(D) set the cat among the pigeons

ANSWER **(b) let the cat out of the bag**

SOLUTION

What the sentence needs. The "but" signals that the surprise was ruined — someone **revealed the secret**.

The idiom. *Let the cat out of the bag* = to disclose a secret, usually by accident. Perfect for a spoiled surprise party.

Why the others fail:

- **play cat and mouse** — to toy with someone before defeating them; about teasing, not revealing.
- **set the cat among the pigeons** — to say or do something that causes trouble or alarm. Close in spirit, but it means causing a commotion, not divulging a secret.
- **send the cat out of the house** — not an idiom at all.

Answer: (b) — let the cat out of the bag

Shortcut

All four options are cat idioms, so the discriminator is the exact meaning. The stem is about a **secret being revealed**, not about causing chaos — which separates (b) from the tempting (d).

61 VARC VOCABULARY IDIOMS AND PHRASES 4 /10

Complete the following sentence by choosing the most appropriate word/phrase from the options given below.

When the young man's father had a heart attack, the whole family panicked; he was the only one who _____ and immediately sent for an ambulance.

(A) **kept his head**
(B) got reasonable
(C) got his cool
(D) remained woke

ANSWER **(a) kept his head**

SOLUTION

What the sentence needs. Everyone else panicked; he alone **stayed calm** and acted.

The idiom. *Keep one's head* = to remain calm in a crisis. It contrasts exactly with the family's panic.

Why the others fail:

- **got reasonable** — not idiomatic; *be reasonable* exists, but "got reasonable" is wrong register and wrong sense.
- **got his cool** — a mangling of two real idioms, *keep one's cool* and *lose one's cool*. "Got his cool" is not English.
- **remained woke** — *woke* means socially aware; it has nothing to do with composure in an emergency.

Answer: (a) — kept his head

Shortcut

Note the semicolon: it sets up a direct contrast with "panicked", so the blank must mean *stayed calm*. Option (c) is the classic near-miss — the idiom is **keep** your cool, never *get* it.

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62 VARC VOCABULARY COMMONLY CONFUSED WORDS 5 /10

Complete the following sentence by choosing the most appropriate word/phrase from the options given below.

My roommate either hosts or attends parties every other day_____.

(A) as she is very egregious
(B) as she is very garrulous
(C) as she is very gracious
(D) **as she is very gregarious**

ANSWER **(d) as she is very gregarious**

SOLUTION

What the sentence needs. A word explaining why she is constantly at parties: she is **highly sociable**.

The word set:

Word	Meaning
gregarious	fond of company; sociable ✓
garrulous	excessively talkative
gracious	courteous, kind
egregious	outstandingly bad, shocking

Why the others fail. *Garrulous* is the trap — it looks and sounds similar and is also about social behaviour, but talkativeness does not explain constant party attendance. *Gracious* describes manners, not sociability. *Egregious* is strongly negative and makes no sense here.

Answer: (d) — gregarious

Shortcut

Gregarious (sociable) versus *garrulous* (talkative) is a standard IPMAT pair — learn them together. The stem is about **going to parties**, which is company-seeking, not talking.

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63 VARC VOCABULARY COMMONLY CONFUSED WORDS ●●●●○○○○○○ 4 /10

Complete the following sentence by choosing the most appropriate word/phrase from the options given below.

The philosophy professor confused his students with a complex ethical problem; Meera was the only one who understood it and gave a/an _____ response.

(A) plausible
(B) hirsute
(C) didactic
(D) obsequious

ANSWER (a) plausible

SOLUTION

What the sentence needs. Meera alone understood, so her response was **credible and reasonable**.

The word set:

Word	Meaning
plausible	believable, reasonable ✓
hirsute	hairy
didactic	intended to teach, often moralising
obsequious	excessively eager to please; fawning

Why the others fail. *Hirsute* is physical and absurd here. *Didactic* describes teaching style, not the quality of an answer, and would be odd from a student. *Obsequious* is about flattering the professor, which contradicts "understood it".

Answer: (a) — plausible

Shortcut

The semicolon again carries the logic: *confused* for everyone else, *understood* for Meera — so the blank must be positive and about soundness of reasoning. Only *plausible* qualifies; the others are not even in the right semantic field.

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64 VARC VOCABULARY IDIOMS AND PHRASES ●●●○○○○○○○ 3 /10

Complete the following sentence by choosing the most appropriate word/phrase from the options given below.

While travelling on the highway my car had a flat tyre; to_____, it started to rain and I got drenched.

(A) **make matters worse**
(B) add to my complexities
(C) perplex me further
(D) befuddle me

ANSWER **(a) make matters worse**

SOLUTION

What the sentence needs. A set phrase introducing an **additional misfortune**: first a flat tyre, then rain.

The idiom. *To make matters worse* is the standard parenthetical connective for exactly this situation.

Why the others fail:

- **add to my complexities** — not idiomatic; one speaks of adding to one's *troubles* or *problems*, not complexities.
- **perplex me further** / **befuddle me** — both mean to confuse or bewilder. But rain after a flat tyre is not *confusing*; it is simply worse. The sentence needs misfortune, not bewilderment.

Answer: (a) — make matters worse

Shortcut

The construction "to _____, ..." is a fixed slot filled by very few phrases in English — *to make matters worse*, *to add insult to injury*, *to top it all*. Recognise the frame and the answer follows.

65 VARC VOCABULARY COMMONLY CONFUSED WORDS ●●●●●●○○○○ 6 /10

In the following sentence, the incorrect part is shown in bold. Choose an alternative from the four given options so that the sentence is rendered correct.

The judge has **disposed himself** from the case because of his prior association with the company.

(A) recanted
(B) refrained
(C) **recused**
(D) recouped

ANSWER **(c) recused**

SOLUTION

What the sentence needs. A judge who steps aside from a case because of a conflict of interest has **recused** himself. It is the precise legal term.

The word set:

Word	Meaning
recuse	to withdraw oneself from a case due to a conflict of interest ✓
recant	to formally withdraw a previously held belief or statement
refrain	to hold back from doing something
recoup	to recover a loss, usually financial

Why the others fail. *Refrain* is the plausible trap, but you refrain **from doing** something, and it is not reflexive — "refrained himself" is ungrammatical. *Recant* concerns statements, *recoup* concerns money.

Answer: (c) — recused

Shortcut

Two clues point the same way: the legal context (judge, case, prior association) and the reflexive structure "___ himself". *Recuse* is the only option that is both legal and naturally reflexive.

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66 VARC GRAMMAR SENTENCE IMPROVEMENT ●●●●●●○○○○ 6 /10

In the following sentence, the incorrect part is shown in bold. Choose an alternative from the four given options so that the sentence is rendered correct.

Even as the team's die-hard fans lost all hopes of a win, **alone came the last batsman and surpassed** them with three sixes in a row, leading the team to its victory.

(A) alone came the last batsman and surprised
(B) **along came the last batsman and surprised**
(C) alone came the last batsman and superannuated
(D) along came the last batsman and superannuated

ANSWER **(b) along came the last batsman and surprised**

SOLUTION

Two separate errors must both be fixed.

Error 1 — *alone* should be *along*. The idiom is *along came X*, meaning X arrived unexpectedly. "Alone came the last batsman" is not idiomatic.

Error 2 — *surpassed* should be *surprised*. *Surpass* means to exceed or outdo, and takes a thing or standard as its object; you cannot "surpass the fans". The sense required is that he astonished them.

Testing each option:

Option	*along*?	*surprised*?
(a) alone / surprised	×	✓
(b) along / surprised	✓	✓
(c) alone / superannuated	×	×
(d) along / superannuated	✓	×

Only (b) fixes both. (*Superannuated* means retired or obsolete — nonsense here.)

Answer: (b)

Shortcut

A two-error question with options laid out as a 2×2 grid. Decide each error independently — *along* over *alone*, *surprised* over *superannuated* — and the intersection gives the answer without reading all four options in full.

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67 VARC GRAMMAR CONDITIONAL SENTENCE ●●●●●●●○○ 7 /10

In the following sentence, the incorrect part is shown in bold. Choose an alternative from the four given options so that the sentence is rendered correct.

Although she has not been at her best this year, **imagine that she would win this match against** the reigning champion, no one would doubt her calibre as a sportsperson.

(A) **should she win this match against**
(B) imagine that she is winning this match against
(C) should she be winning this match against
(D) imagine if she win this match against

ANSWER **(a) should she win this match against**

SOLUTION

What the sentence needs. The main clause is "no one **would doubt**", so the opening clause must be a proper conditional expressing a hypothetical future event.

The construction. English allows a formal inversion for conditionals:

Should she win this match..., no one would doubt...

This is equivalent to "If she should win this match..." and pairs correctly with *would*.

Why the others fail:

- **(b)** "imagine that she is winning" uses a present continuous, which cannot set up a *would* clause, and the imperative *imagine* does not belong in a conditional structure here.
- **(c)** "should she be winning" is grammatical in isolation but the continuous aspect is wrong for a single decisive result.
- **(d)** "imagine if she win" has a bare subject-verb disagreement — *she win* instead of *she wins*.

Answer: (a)

Shortcut

Look at the main clause first: *would doubt* demands a hypothetical conditional. Then prefer the simple over the continuous — winning a match is a single event, not an ongoing state. That ordering settles (a) over (c) quickly.

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68 VARC GRAMMAR SENTENCE IMPROVEMENT ●●●●●○○○○○ 5 /10

In the following sentence, the incorrect part is shown in bold. Choose an alternative from the four given options so that the sentence is rendered correct.

Don't get mad at me. I did not invite a third person to the meeting; I only asked my assistant to **create a link and sent it** to the team.

(A) **create a link and send it**
(B) to create a link and sent it
(C) creating a link and sending it
(D) created a link and sent it

ANSWER **(a) create a link and send it**

SOLUTION

The error is faulty parallelism inside an infinitive. The sentence runs "asked my assistant **to**...", so both verbs must be bare infinitives governed by that single *to*:

asked my assistant to create ✓ a link and send ✓ it

The original pairs *create* with the past tense *sent*, which cannot follow *to*.

Why the others fail:

- **(b)** "to create a link and sent it" repeats the *to* but keeps the past tense on the second verb — the actual error is untouched.
- **(c)** gerunds cannot follow "asked my assistant to".
- **(d)** makes both verbs past tense, which breaks the infinitive construction entirely.

Answer: (a) — create a link and send it

Shortcut

Find the governing word — here *to* — and check that every verb joined by *and* can follow it directly. "To create... and send" works; "to create... and sent" does not. Same test as any parallelism question.

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69 VARC VOCABULARY COMMONLY CONFUSED WORDS ●●●○○○○○○○ 4 /10

In the following sentence, the incorrect part is shown in bold. Choose an alternative from the four given options so that the sentence is rendered correct.

The college now has a **creator** to help students with their personal as well as academic challenges.

(A) councilor
(B) controller
(C) **counsellor**
(D) consoler

ANSWER **(c) counsellor**

SOLUTION

What the sentence needs. Someone employed by a college to help students with personal and academic difficulties is a **counsellor**.

The word set:

Word	Meaning
counsellor	a person trained to give guidance on personal or psychological problems ✓
councillor	an elected member of a council (note the different spelling)
controller	a person who manages or regulates, usually finances
consoler	one who comforts — a real word, but not a role or job title

Why the others fail. *Councilor* is the classic homophone trap and concerns local government, not student welfare. *Controller* is administrative. *Consoler* captures only sympathy, not guidance, and no college appoints one.

Answer: (c) — counsellor

Shortcut

Counsellor (gives advice) versus *councillor* (sits on a council) is one of the most frequently tested homophone pairs. The giveaway is the context: “help students with personal as well as academic challenges” is advice-giving, not governance.

70 VARC VERBAL ABILITY SENTENCE COMPLETION AND INSERTION 6 /10

The paragraph below has a sentence missing, indicated by a blank. Choose the sentence that is most logically appropriate to complete the paragraph.

With access to content and streaming video platforms among Indian viewers increasing, producers and creators seem to be taking fewer risks. Streaming service subscribers in India have traditionally appreciated the craft, acting, and storytelling of some exceptional videos on platforms like Netflix and HBO. _____. Driven by algorithms and a tendency to replicate templates that have worked in the past, Indian streamers increasingly favour star-led shows and films that promise safety over experimentation. Hence 2025 had fewer standout originals.

(A) Since a large proportion of OTT viewers in India use smart phones to view videos, the content has to be discerning.

(B) Now that smart phones are commonplace, viewing videos is no longer part of the shared and family time.

(C) Without a discerning viewership, Indian producers have had to use social media to promote and sell their stories.

(D) Yet, this past year, Indian producers have gravitated towards content that entertains a wider section of viewers.

ANSWER **(d) Yet, this past year, Indian producers have gravitated towards content that entertains a wider section of viewers.**

SOLUTION

Work out what the blank must do. The sentence before it says Indian subscribers have **traditionally appreciated** craft and storytelling. The sentences after describe producers chasing **safe, star-led, formulaic** content, ending "Hence 2025 had fewer standout originals."

So the blank must mark the **turn** from that tradition to the present retreat.

Why option (d) works. "**Yet**, this past year, Indian producers have gravitated towards content that entertains a wider section of viewers."

- *Yet* supplies the contrast with "traditionally appreciated" ✓
- *this past year* sets up "Hence **2025** had fewer standout originals" ✓
- *a wider section of viewers* is then explained by the next sentence's algorithms and star-led safety ✓

Why the others fail:

- **(a)** and **(b)** both introduce smartphones, a topic that appears nowhere else in the paragraph.
- **(c)** says the viewership is *not* discerning, contradicting the preceding sentence, and shifts to social-media marketing, which is never mentioned again.

Answer: (d)

Shortcut

Two anchors fix this: the contrast with "traditionally" demands a word like *Yet*, and the closing "Hence 2025" demands a time marker in the inserted sentence. Only one option supplies both.

71 VARC VERBAL ABILITY SENTENCE COMPLETION AND INSERTION 7 /10

The paragraph below has a sentence missing, indicated by a blank. Choose the sentence that is most logically appropriate to complete the paragraph.

Till recently, weight-loss drugs have been an elite privilege, creating a class system among those battling obesity and diabetes and setting new aspirational benchmarks for a healthy life. Manufacturers have now lowered their prices to tap into a booming health-conscious market in India. Despite repeated clarification that the efficacy of the drug is co-dependent on diet, lifestyle corrections, fitness routines and, most importantly, baseline fitness and health, the drug is seen as manna from heaven. _____. This leads to the individual surrendering to a false sense of well-being.

(A) Weight loss is a path to thinness, a healthier lifestyle and a more attractive image.

(B) Weight loss drugs have allowed celebrities to parade their thin age-defying bodies.

(C) **The once-a-week jab is seen as a convenience obviating the need for any other action.**

(D) This creates a false sense of complacency about the drugs notwithstanding their side effects

ANSWER **(c) The once-a-week jab is seen as a convenience obviating the need for any other action.**

SOLUTION

Identify the gap. Before the blank: the drug's efficacy depends on diet, lifestyle and fitness, **yet** it is treated as "manna from heaven". After the blank: "**This** leads to the individual surrendering to a false sense of well-being."

The blank must explain *how* the manna-from-heaven attitude produces that false sense — and it must be something "This" can refer to.

Why option (c) works. "The once-a-week jab is seen as a convenience **obviating the need for any other action**."

That is the precise bridge: the drug is believed to remove the need for diet and exercise (picking up the previous sentence), and believing that is exactly what produces a false sense of well-being (setting up the next).

Why the others fail:

- **(d)** is the trap. It is thematically close, but it *states the consequence* — "creates a false sense of complacency" — which the following sentence then states again. That makes the next sentence redundant, and it introduces side effects, never mentioned elsewhere.
- **(a)** is a bland generalisation that explains nothing.
- **(b)** brings in celebrities, a topic the paragraph drops entirely.

Answer: (c)

Shortcut

When two options point the same way, prefer the one that leaves work for the following sentence. (d) pre-empts "This leads to... a false sense of well-being" and makes it repetitive; (c) supplies the *cause* and lets the next sentence deliver the *effect*.

72 VARC VERBAL ABILITY SENTENCE COMPLETION AND INSERTION 6 /10

The paragraph below has a sentence missing, indicated by a blank. Choose the sentence that is most logically appropriate to complete the paragraph.

Writing has long been a primary tool for thinking. _____. The articulation of thought, a foundational human skill, risks atrophy due to the deployment of AI. 'Help' from AI is a gentle, persistent pressure removing idiosyncrasies and pushing writers towards a standardised, middle-of-the-road voice. In a manner of speaking, the originality of the writer's voice is lost. Hence, the unique signature of the writer is eroded by an algorithm.

(A) For writers, the help provided by AI is essential for the formation of lucid thoughts.

(B) Thinking is a process expressed best by smooth, frictionless prose assisted by AI.

(C) **When that process is delegated to an outside agency, thinking itself becomes superficial.**

(D) Without human effort, however, difficult concepts cannot be easily communicated to the reader.

ANSWER **(c) When that process is delegated to an outside agency, thinking itself becomes superficial.**

SOLUTION

Identify the gap. The opening sentence establishes writing as a **tool for thinking**. The sentence after the blank warns that "the articulation of thought... **risks atrophy**" because of AI.

The blank must carry us from "writing is how we think" to "that capacity is now at risk".

Why option (c) works. "When **that process** is delegated to an outside agency, **thinking itself becomes superficial**."

- "That process" points directly back to writing-as-thinking in sentence 1 ✓
- "delegated to an outside agency" introduces AI without naming it, which the next sentence then names ✓
- "thinking becomes superficial" is precisely the atrophy the next sentence describes ✓

Why the others fail:

- **(a)** and **(b)** are both *pro-AI* and contradict the entire paragraph, which concludes that the writer's signature is eroded.
- **(d)** is negative about AI in the right direction but concerns **communication to the reader**, whereas the paragraph is about the writer's own thinking and voice.

Answer: (c)

Shortcut

Check the paragraph's polarity first — it is uniformly critical of AI, so two options go immediately. Between the survivors, (c) contains the demonstrative "that process", which ties straight back to the opening sentence; (d) has no such link.

Prefer a structured plan with recorded classes and tests? Look at the self-prep courses. See courses

73 VARC VERBAL ABILITY SENTENCE COMPLETION AND INSERTION 6 /10

The paragraph below has a sentence missing, indicated by a blank. Choose the sentence that is most logically appropriate to complete the paragraph.

Tech companies are spending billions to build data centres that power AI systems for growth and security. But data centres consume huge amounts of electricity, which has raised the cost of electricity for those living near the data centres. Some tech giants are now saying they will seek to pay not just for the energy its data centres use, but also to cover the costs of updating and adding necessary electricity to the grid. _____.

(A) **This way the additional electricity costs will not be passed on to other local consumers.**

(B) Not all tech companies will be able to afford the additional electricity costs.

(C) Governments should bear the additional electricity costs, as AI will provide greater security.

(D) This way the anger of the public will not be directed at the tech companies.

ANSWER **(a) This way the additional electricity costs will not be passed on to other local consumers.**

SOLUTION

Identify the gap. This blank **closes** the paragraph, so it should state the consequence of the sentence before it: tech giants offering to pay both for their own energy *and* for upgrading the grid.

Why option (a) works. "**This way** the additional electricity costs will not be passed on to other local consumers."

The paragraph set up a specific problem — "raised the cost of electricity for **those living near** the data centres" — and option (a) resolves exactly that problem, closing the loop between problem and remedy.

Why the others fail:

- **(d)** is the closest distractor and also begins "This way", but it shifts the point to **public relations**. The paragraph's stated harm was financial, borne by local residents, not reputational.
- **(b)** introduces affordability for smaller companies, a new topic at the very end.
- **(c)** proposes government funding, contradicting the sentence before it, in which the companies themselves offer to pay.

Answer: (a)

Shortcut

Match the ending to the problem the paragraph actually posed. The harm named was higher bills for nearby residents, so the resolution must address *those residents' costs*. (d) mimics the structure but answers a problem the paragraph never raised.

74 VARC VERBAL ABILITY CLOZE TEST 6 /10

Some of the words in the paragraph below are missing. Choose the best option to complete it.

The newly appointed professor found it hard to_____the students who were_____ and_____to the topics discussed during lectures.

(A) **encourage; withdrawn; indifferent**
(B) enthuse; difficult; undisciplined
(C) inspire; belligerent; uninstructed
(D) engage; deficient; diffident

ANSWER **(a) encourage; withdrawn; indifferent**

SOLUTION

Blank 3 is the most constrained — start there. The word must be followed by the preposition **to**: "_____ **to** the topics discussed".

- *indifferent* ***to*** ✓ — the natural collocation
- *undisciplined to* ×, *uninstructed to* ×, *diffident to* × (one is diffident *about*)

That alone points to option (a).

Confirm the other two blanks.

- **Blank 1:** *encourage* the students — fits a professor's effort ✓
- **Blank 2:** *withdrawn* — reserved, unresponsive. It pairs naturally with *indifferent*: the students neither participate nor care ✓

Together the sentence reads: the professor struggled to encourage students who were unresponsive and uninterested — coherent throughout.

Why the others fail. Besides the preposition problem, option (c)'s *belligerent* (aggressive) clashes with *uninstructed*, and option (d)'s *deficient* needs an object ("deficient **in** what?").

Answer: (a)

Shortcut

Let the **preposition** decide. "___ to the topics" admits only *indifferent* among the four, so blank 3 settles the question before you weigh the subtler choices at blanks 1 and 2.

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75 VARC VERBAL ABILITY CLOZE TEST 6 /10

Some of the words in the paragraph below are missing. Choose the best option to complete it.

In the hothouse_____of social media, you are filled with envy when you scroll through photos of exotic_____and gleaming houses, but you reassure yourself that only_____people want these things – your humble home is all that you really want.

(A) climate; vistas; ordinary
(B) excitement; locations; overachieving
(C) **atmosphere; vacations; superficial**
(D) madness; destinations; embarrassing

ANSWER **(c) atmosphere; vacations; superficial**

SOLUTION

Blank 1 — the collocation. The fixed phrase is *hothouse* ***atmosphere*** — an intense, overheated environment. "Hothouse climate" is redundant (a hothouse *is* a climate) and "hothouse madness" is not English.

Blank 2 — what you scroll past. It must pair with "gleaming houses" as a thing people envy. *Exotic* ***vacations*** is the natural pairing; *vistas*, *locations* and *destinations* are all places rather than experiences, and sit oddly beside houses.

Blank 3 — the self-reassurance. You console yourself by thinking less of those who want such things. *Only* ***superficial*** *people want these things* works perfectly as a dismissal.

- *ordinary* × — being ordinary is no reason for disdain
- *overachieving* × — would be admiring, not dismissive
- *embarrassing* × — wrong form; people are *embarrassed*, things are *embarrassing*

Answer: (c)

Shortcut

Blank 3 carries the sentence's logic: the clause begins "but you **reassure yourself**", so the word must be mildly disparaging. Only *superficial* dismisses. Confirm with the fixed phrase *hothouse atmosphere* and you are done.

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76 VARC VERBAL ABILITY CLOZE TEST ●●●●●●○○○○ 6 /10

Some of the words in the paragraph below are missing. Choose the best option to complete it.

Some philosophers have used a_____ of bees as a transparent metaphor for modern_____. In the hive, they argue, each bee works for its own personal gain, every profession has its own vulnerabilities; and everyone_____the passions of others.

(A) **community; societies; exploits**
(B) collection; socialism; admits
(C) congregation; objectivity; rejects
(D) conglomeration; armies; annihilates

ANSWER **(a) community; societies; exploits**

SOLUTION

Blank 1 — the collective noun. A group of bees living together is a **community** (the passage goes on to call it a hive). *Collection* suits objects, *congregation* suits worshippers, and *conglomeration* suits a disorderly mass — none describes a social group of organisms well.

Blank 2 — what the hive is a metaphor for. The following sentence describes personal gain, professions and passions: that is a picture of **modern societies**. *Socialism* is contradicted by "each bee works for its own personal gain"; *objectivity* and *armies* do not fit professions and passions at all.

Blank 3 — the relationship between members. In a system where each works for personal gain, everyone **exploits** the passions of others. *Admits*, *rejects* and *annihilates* each break the logic of mutual self-interest.

Answer: (a)

Shortcut

Blank 2 is decisive and quick: the sentence after it describes **self-interest**, which rules out *socialism* instantly, and *objectivity* and *armies* are not things a beehive is a metaphor for. One blank, three eliminations.

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77 VARC VERBAL ABILITY CLOZE TEST ●●●●●●●○○○ 7 /10

Some of the words in the paragraph below are missing. Choose the best option to complete it.

A useful definition for anger can be found in Aristotle, which is also the starting point for an established Western_____of reflection. Here, anger is a response to _____damage to something or someone one cares about, and a damage that the angry person believes to have been_____inflicted.

(A) habit; wilful; erroneously

(B) **tradition; significant; wrongfully**

(C) philosophy; consequential; unsuspectingly

(D) culture; universal; uncannily

ANSWER **(b) tradition; significant; wrongfully**

SOLUTION

Blank 1 — the collocation. "An established Western **tradition** of reflection" is the idiomatic phrase, and it fits "starting point" — a tradition has a beginning. *Habit of reflection* is too small; *philosophy of reflection* is redundant; *culture of reflection* does not take "established Western" as naturally.

Blank 2 — the kind of damage. Anger responds to damage that matters: **significant** damage. *Wilful* is the trap — it describes the *manner* of inflicting, which the third blank already covers, so using it here is redundant. *Universal* and *consequential* both misfit.

Blank 3 — how the damage was inflicted. The angry person believes it was **wrongfully** inflicted — unjustly. That is the heart of Aristotle's account: anger is a response to perceived injustice.

- *erroneously* × — means by mistake, which would reduce anger, not cause it
- *unsuspectingly* / *uncannily* × — neither describes injustice

Answer: (b)

Shortcut

Blank 3 is the key and the concept is Aristotle's: anger follows a **perceived injustice**. Only *wrongfully* conveys that. *Erroneously* is its near-twin in sound but means "by mistake" — the opposite of blameworthy.

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78 VARC VERBAL ABILITY CLOZE TEST 7 /10

Some of the words in the paragraph below are missing. Choose the best option to complete it.

Even as technology threatens to alter medicine_____, doctors work with the conviction that they are_____ in matters of prognosis and treatment. History, however, shows that those most invested in their own_____are rarely the best judges of their own irreplaceability.

(A) incredibly; reliable; concerns

(B) invaluably; opportunistic; determination

(C) **irrevocably; indispensable; survival**

(D) unimaginably; immutable; subculture

ANSWER **(c) irrevocably; indispensable; survival**

SOLUTION

Blank 2 is the anchor — work from the last sentence backwards. The paragraph ends on "the best judges of their own **irreplaceability**". So the conviction doctors hold must be that they are **indispensable**. That single match points to option (c).

Blank 1 — how technology alters medicine. *Irrevocably* — permanently, beyond reversal. This sets up the threat the doctors are resisting. (*Incredibly* and *unimaginably* are vague intensifiers; *invaluably* would be positive, clashing with "threatens".)

Blank 3 — what they are invested in. Their own **survival** — professional survival, which is precisely what irreplaceability is about.

Why the others fail. Option (a)'s *reliable* and option (d)'s *immutable* do not connect to irreplaceability; option (b)'s *opportunistic* is pejorative and makes no sense as a self-conviction.

Answer: (c)

Shortcut

Read to the **end** before filling anything in. The word *irreplaceability* in the final clause is a direct synonym clue for blank 2, and *indispensable* appears in only one option. Cloze passages often hide the key after the last blank.

79 VARC VERBAL ABILITY CLOZE TEST 6 /10

Some of the words in the paragraph below are missing. Choose the best option to complete it.

The_____of the uneducated masses can be described as a_____ faith that believes in fake Godmen based on instinct or emotion rather than on any _____ premise.

(A) hysteria; jingoistic; logical

(B) credibility; faulty; possible

(C) indifference; strong; obvious

(D) **credulity; groundless; objective**

ANSWER **(d) credulity; groundless; objective**

SOLUTION

Blank 1 — the right noun. The quality that makes people believe in fake Godmen is **credulity** — a readiness to believe without evidence.

Credibility is the trap: it means believability, a quality of the **claim**, not of the believer. The masses here are credulous, not credible. *Hysteria* is about panic, *indifference* about not caring — neither describes belief.

Blank 2 — the kind of faith. Groundless — having no evidential basis. This fits "based on instinct or emotion".

Blank 3 — the contrast. The structure is "based on instinct or emotion **rather than** on any _____ premise", so the word must be the opposite of instinct and emotion: **objective**.

- *logical* in option (a) would also work here, but (a) fails on both earlier blanks
- *possible* and *obvious* do not contrast with emotion at all

Answer: (d)

Shortcut

Credulity versus *credibility* decides it — one is the gullibility of the believer, the other the believability of the claim. The stem's subject is "the uneducated masses", that is, the believers.

READING PASSAGE

Passage 2 – Rage bait and the economics of outrage

Anger can be a useful emotion. It can play a key role in building a strong individual psyche, as also a just society. But the algohacking of our brains to keep them in a state of incessant anger? That's pure poison. Some companies and individuals draw colossal profits from it, but at terrible cost to general well-being. That rage bait has been declared Oxford English Dictionary's word of 2025 is indicative of the spread of this poison. In 2024, it was brain rot that came on top. Both speak of the same diseased online ecosystem. All of this is bad enough for adults, but what it's doing to children is a great nightmare.

Specifically, rage bait refers to online content designed to elicit anger or outrage. Once tech platforms figured out how this kind of content spirals user engagement, the algorithms got tweaked to feed us more and more of the same, activating a diabolical incentive structure of hate. Of course, in this swamp, reality is completely distorted. You could take any major event of recent times as an example and the difference between your newspaper's reportage and your online feed would be dramatic. Reading responsible accounts of pollution, a terror attack, an election result etc. would give you food for thought. On social media, you would be targeted with stuff doctored to send you into troll mode.

If you block the accounts that most inflame you, you deprive them of your attention, you refuse to buy the hate they are selling. Blocking even hurts them with the algorithm. David did defeat Goliath.

And make no mistake, this is a civilisational battle. We must fight against the atrophy of our attention, its capture by the most terrible types of things that human nature can be drawn to, and to regain our sense and sensibility.

80 VARC | READING COMPREHENSION - QUESTION TYPES | RC DETAIL AND FACT BASED QUESTIONS

6 /10

What was the primary purpose of the "Nilometer"?

(A) To track the speed of trade ships travelling downstream.

(B) **To measure riverine levels to predict agricultural yields and fix tax rates.**

(C) To calculate distances using the flow of water in the Nile.

(D) To measure the consumption of water by the capital city.

ANSWER **(b) To measure riverine levels to predict agricultural yields and fix tax rates.**

SOLUTION

Where the transcript says it. The Guest's first answer: "A Nilometer was used to **measure the Nile's water levels** and helped officials **forecast harvest quality**, anticipate famine or abundance, and **calculate tax levies** based on the flood height."

Option (b) covers all three functions: measuring levels, predicting yield, and setting tax.

Why the others fail: ships, distances and municipal water consumption appear nowhere in the transcript. They are plausible-sounding inventions built around a river.

Answer: (b)

Shortcut

The definition sits in the sentence that introduces the term. Three options invent uses the transcript never mentions; only one matches the two stated functions — harvest forecasting and tax calculation.

Refers to the RC set above.

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81 VARC READING COMPREHENSION - QUESTION TYPES RC VOCABULARY IN CONTEXT ●●●●●●○○○○ 6 /10

The term 'agency' with respect to the government refers to the

(A) department responsible for calculation and collection of taxes.

(B) ability of individual citizens to import and export on behalf of the government.

(C) **government's ability to exert power and organise resources within its territory.**

(D) mercantile belief that the government controlled all commerce.

ANSWER **(c) government's ability to exert power and organise resources within its territory.**

SOLUTION

Read the sentence that contains the word. "This geographical confinement **gave the government immense agency**. They could tax with 100% efficiency because they knew exactly how much land was fertile each year."

Here *agency* means capacity to act — the power to tax, control and organise. Option (c) states exactly that.

Why the others fail:

- **(a)** takes "agency" in its other sense, an office or department. The transcript uses it as an abstract noun, and no department is mentioned.
- **(b)** transfers the agency to citizens; the sentence attributes it to the government.
- **(d)** invents a doctrine (mercantilism) that is never raised.

Answer: (c)

Shortcut

This is a two-meaning trap: *agency* as "an organisation" versus *agency* as "capacity to act". The phrase "gave the government immense agency" cannot mean an organisation was given, so the abstract sense must be right.

Refers to the RC set above.

🧪 Vocabulary sticks when it is drilled in short bursts, not memorised in lists. Word Lab

82 VARC READING COMPREHENSION - QUESTION TYPES CONCEPT A/ PHRASE MEANING 6 /10

In the conversation, what does the term 'linear artery' imply about the Nile's role in Egypt?

(A) It was the perennial source of water for most citizens.

(B) It was a corpuscular thread that ran from the North to the South of the country.

(C) It was a complex network of hundreds of small, aortic streams.

(D) **It served as the singular, vital channel for all movement and survival in the region.**

ANSWER **(d) It served as the singular, vital channel for all movement and survival in the region.**

SOLUTION

Where the transcript says it. "Because the Nile is a **single linear artery**, whoever controlled the river controlled all transport and communication... In the Nile Valley, there is nowhere to go but the desert."

Two ideas are packed into the metaphor: **singular** (one artery, not a network) and **vital** (an artery carries life). Option (d) captures both, and adds the movement point the transcript makes directly.

Why the others fail:

- **(c)** is the precise opposite — "a complex network of hundreds of streams" contradicts *single*.
- **(b)** fixates on the anatomy word and direction, missing the function entirely.
- **(a)** is true of a river in general but ignores the transport and control that the metaphor exists to convey.

Answer: (d)

Shortcut

Unpack the metaphor into its two parts — *linear* (one route only) and *artery* (carries what keeps you alive) — then find the option containing both. (c) fails the first, (a) the second.

Refers to the RC set above.

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83 VARC READING COMPREHENSION - QUESTION TYPES RC INFERENCE QUESTIONS 6 /10

The Host refers to a "logic-gate". What is the 'input' and the 'output' of this gate?

(A) Input: Prayers and sacrifices; Output: Increased harvest.

(B) **Input: Environmental data; Output: Administrative action.**

(C) Input: Agriculture; Output: Exports.

(D) Input: Nilometer; Output: Inference.

ANSWER **(b) Input: Environmental data; Output: Administrative action.**

SOLUTION

Trace the mechanism the Guest describes. "If the flood reached 'X' height, you would have an abundance of grain; if it reached 'Y', you faced famine and so forth."

The gate takes in a **flood measurement** — environmental data — and produces **a decision**: forecast the harvest, anticipate famine, set the tax levy. That is administrative action.

Why the others fail:

- **(a)** introduces religion, which the Host explicitly sets aside at the start ("we often think of Ancient Egypt as a product of divine kingship, **but you argue** it was a product of logistical necessity").
- **(c)** names exports, never discussed.
- **(d)** is the closest distractor, but the Nilometer is the **instrument**, not the input, and an inference is an intermediate step rather than the administrative output the passage emphasises.

Answer: (b)

Shortcut

A logic gate turns *data* into *a decision*. Option (d) is tempting but names a device and a thought rather than an input and an output — the gate's whole point in the transcript is that measurements became tax levies.

Refers to the RC set above.

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84 VARC READING COMPREHENSION - QUESTION TYPES RC INFERENCE QUESTIONS ●●●●●●○○○○ 6 /10

If the Nilometer reading in a given year was significantly lower than that of the previous year, what logical conclusion would the Egyptian bureaucracy arrive at?

(A) Tax revenues for the coming year would likely increase.

(B) The quantum of arable land would remain unchanged that year.

(C) **Food reserves would need to be managed strictly to prevent famine.**

(D) They should immediately increase the volume of grain exports.

ANSWER **(c) Food reserves would need to be managed strictly to prevent famine.**

SOLUTION

Apply the stated rule. "If the flood reached 'X' height, you would have an abundance of grain; **if it reached 'Y', you faced famine**." A lower reading therefore signals a weaker harvest.

A weaker harvest means less grain, so reserves must be conserved — option (c).

Why the others fail:

- **(a)** reverses the logic: tax levies were "calculated based on the flood height", so a lower flood means **lower** revenue.
- **(b)** contradicts the explanation that they "knew exactly how much land was fertile each year **based on the flood levels**" — less flood, less fertile land.
- **(d)** is the opposite of prudent: you do not export more grain in a year of shortage.

Answer: (c)

Shortcut

This is an application question — take the stated if-then rule and run it one step. Low flood → poor harvest. Then ask which option is consistent with scarcity; three of them describe behaviour appropriate to abundance.

Refers to the RC set above.

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85 VARC READING COMPREHENSION - QUESTION TYPES CAUSE & EXPLANATION 6 /10

Why was “geographical confinement” beneficial to the central Egyptian government?

A **It restricted the population to a narrow, observable corridor, facilitating administrative oversight of movement and resources.**

B It minimized the need for a complex governance structure by forcing all citizens to live in a single city.

C It allowed for the easy expansion of the Egyptian state into landlocked territories.

D It provided a natural defence against both land as well as sea-based invasions.

ANSWER **(a) It restricted the population to a narrow, observable corridor, facilitating administrative oversight of movement and resources.**

SOLUTION

Where the transcript says it. “In a forest or a vast plain, a rebellious group might hide or move. **In the Nile Valley, there is nowhere to go but the desert.** This geographical confinement gave the government immense agency. They could tax with 100% efficiency because they knew exactly how much land was fertile.”

Nowhere to hide means the population stays visible and countable — administrative oversight of both movement and resources, exactly option (a).

Why the others fail:

- **(b)** says “a single city”, which the transcript never claims; the valley is a corridor, not a city.
- **(c)** is about expansion, whereas confinement is precisely the opposite idea.
- **(d)** introduces invasion and defence, a theme absent from the conversation.

Answer: (a)

Shortcut

The benefit stated is **control**, not defence or expansion. Pair “nowhere to go but the desert” with “tax with 100% efficiency” and you get visibility of people and resources — only one option says that.

86 VARC VERBAL ABILITY PARA JUMBLES 5 /10

The sentences given below, when properly sequenced, form a coherent paragraph. Each sentence is labelled with a number. Decide on the most logical order and enter the sequence of numbers in the space provided.

1. But, streaming service Deezer, which has developed tools to tackle AI music, points out that many of her albums on the platform are flagged as computer generated.
2. Three of Sienna Rose's jazz-infused soul songs are in the Viral Top 50.
3. Look closer and you'll see the indications of an AI artist such as no social media presence, no videos, and an improbable number of songs released in a short space of time.
4. The most popular, a dreamy ballad titled Into the Blue, has been played more than five million times.

ANSWER 2413

SOLUTION

Step 1 — find the opener. Sentence **2** is the only one that names its subject in full: "Three of **Sienna Rose's** jazz-infused soul songs". Every other sentence depends on her already being introduced — "**her** albums" in 1, "**The most popular**" in 4, "Look closer" in 3.

Step 2 — follow the superlative. Sentence **4** begins "**The most popular**", which must refer to the three songs just mentioned. So $2 \to 4$.

Step 3 — introduce the twist. Sentence **1** opens with "**But**" and reverses the picture: the songs are flagged as computer generated. A contrast must follow what it contradicts, namely the success described in 2 and 4.

Step 4 — close with the evidence. Sentence **3** says "**Look closer** and you'll see the indications of an AI artist" — this only makes sense once the AI suspicion has been raised in 1, and it supplies the supporting detail.

Step 5 — the sequence.

$2 \to 4 \to 1 \to 3$

Answer: 2413

Shortcut

Only one sentence contains a full name rather than a pronoun — that is your opener. Then the mandatory pair is $2 \to 4$ ("Three songs" → "The most popular"), and "But" in 1 cannot come first. The order falls out with almost no reading.

87 VARC VERBAL ABILITY PARA JUMBLES 6 /10

The sentences given below, when properly sequenced, form a coherent paragraph. Each sentence is labelled with a number. Decide on the most logical order and enter the sequence of numbers in the space provided.

1. "It's going to be less of freak biological occurrences and more like hurricanes, which are increasing and becoming more devastating", say health experts.
2. It is hard to predict which pathogen could launch the next global health crisis, but infectious diseases experts say they are closely watching various outbreaks world-wide for signs of pandemic potential.
3. Pandemics are expected to occur more often and become more deadly because of climate change, globalisation, and the billions of livestock we raise to eat, as well as wild animals whose habitats we have diminished.
4. A manufactured pathogen is also a danger. Due to advances in medical technology and AI, a single rogue actor can create a threat.

ANSWER 3124

SOLUTION

Step 1 — find the opener. Sentence **3** makes the paragraph's general claim — pandemics will be more frequent and more deadly — and gives the reasons. It introduces the topic without referring back to anything.

Step 2 — the quotation elaborates it. Sentence **1** quotes health experts saying outbreaks will be "less of freak biological occurrences and **more like hurricanes, which are increasing**". That directly restates sentence 3's claim about rising frequency, so it must follow it.

Step 3 — move from frequency to identity. Sentence **2** shifts the question from *how often* to *which pathogen*, and notes experts are watching outbreaks worldwide.

Step 4 — add the final category. Sentence **4** begins "A manufactured pathogen is **also** a danger." The word *also* marks an addition to the natural pathogens discussed in 2, so it closes the paragraph.

Step 5 — the sequence.

$3 \to 1 \to 2 \to 4$

Answer: 3124

Shortcut

The word **also** in sentence 4 guarantees it is not first and must follow a discussion of other dangers — that pins the ending. At the other end, the quotation in 1 needs a claim to support, so 3 opens.

88 VARC VERBAL ABILITY PARA JUMBLES 7 /10

The sentences given below, when properly sequenced, form a coherent paragraph. Each sentence is labelled with a number. Decide on the most logical order and enter the sequence of numbers in the space provided.

1. In established companies, putting in extra hours is usually a way to get ahead. Elon Musk once said that no one ever changed the world on a 40-hour workweek. They are less likely to be promoted too.
2. There are also other ways to approach this question. You might argue that the optimal workweek is defined by output, not hours. You might say that this is one for policy makers.
3. How long people actually work is not the same as how long they ought to. Jobs, incomes and cultural norms vary so wildly that there is no right answer.
4. Nine to five is still alive. Sort of. A new survey of labour-force data finds that the world's adult employed population works an average of 42 hours a week.

ANSWER 1432

SOLUTION

Step 1 — spot the closer first. Sentence **2** opens "There are **also** other ways to approach this question." *Also* and *other* both point backwards, so 2 must come last — and "this question" needs a question to have been raised.

Step 2 — the opener. Sentence **1** sets up the cultural premise: in established companies, long hours are how you get ahead, backed by the Musk quotation. It introduces the subject of working hours without referring back.

Step 3 — bring in the data. Sentence **4** answers the premise with evidence: "Nine to five is still alive. Sort of" — the survey finding of 42 hours a week.

Step 4 — raise the question. Sentence **3** draws the distinction between how long people **actually** work and how long they **ought** to, concluding "there is no right answer". This is "this question" that sentence 2 then refers to.

Step 5 — the sequence.

$1 \to 4 \to 3 \to 2$

A note on the source: sentence 1 as printed ends "They are less likely to be promoted too", where "They" has no clear antecedent within the sentence — the official paper appears to carry a typographical slip here. The intended order is unaffected.

Answer: 1432

Shortcut

Work backwards from sentence 2: "**also** other ways to approach **this question**" is doubly backward-looking, so it is last and something before it must pose a question. Sentence 3 is the only one that does — so 3 is second-last, and the rest follows.

89 VARC VERBAL ABILITY PARA JUMBLES 5 /10

The sentences given below, when properly sequenced, form a coherent paragraph. Each sentence is labelled with a number. Decide on the most logical order and enter the sequence of numbers in the space provided.

1. During the last 150 years or so, the world production of food has increased for two main reasons.
2. At the same time the development of various branches of science, and in particular medical science, has helped to eliminate or lessen the effects of many diseases, enabling more adults to reach old age.
3. New lands have been brought into use for farming for the first time, and new techniques have made it possible to obtain higher yields in existing farming areas.
4. The relentless growth of world population over the last 150 to 200 years was only possible because more and more food and other items of consumption became available.

ANSWER 4132

SOLUTION

Step 1 — find the opener. Sentence **4** states the paragraph's overall claim: population growth was possible **because** more food became available. It is the thesis the rest explains.

Step 2 — narrow to food production. Sentence **1** picks up that food supply and announces a structure: it "has increased for **two main reasons**". A sentence promising two reasons must be followed by them.

Step 3 — the first reason. Sentence **3** delivers it: new farmland and better techniques. These are both agricultural, i.e. the first reason.

Step 4 — the second reason. Sentence **2** begins "**At the same time**" and adds medical science. That connective requires a preceding item, which sentence 3 supplies.

Step 5 — the sequence.

$4 \to 1 \to 3 \to 2$

Answer: 4132

Shortcut

Sentence 1's phrase "**two main reasons**" is a signpost — the two reasons must come immediately after it, and "At the same time" in 2 marks the second of them. That fixes 1-3-2 as a block, leaving only 4 to open.

90 VARC VERBAL ABILITY PARA JUMBLES

5 /10

The sentences given below, when properly sequenced, form a coherent paragraph. Each sentence is labelled with a number. Decide on the most logical order and enter the sequence of numbers in the space provided.

1. Faced with an ageing population and sluggish economy, Beijing proposes to encourage more young people to marry and have children.
2. At the same time, its death rate rose to 8.04 per 1,000 people.
3. China's birth rates fell for the fourth consecutive year and sunk to a record low.
4. Despite the government rolling out a spate of incentives to boost it, the country's birth rate fell to 5.63 per 1,000 people.

ANSWER 3421

SOLUTION

Step 1 — find the opener. Sentence **3** names the subject in full — "**China's** birth rates" — and states the headline fact. Every other sentence refers back: "**its** death rate" in 2, "to boost **it**" in 4, "Beijing" responding to a situation in 1.

Step 2 — give the figure. Sentence **4** supplies the specific number for that fall: "the country's birth rate fell to 5.63 per 1,000 people", with "to boost **it**" pointing back to the birth rate in 3.

Step 3 — add the other side of the ledger. Sentence **2** begins "**At the same time**, its death rate rose" — the natural counterpart to a falling birth rate, and it needs the birth-rate discussion to precede it.

Step 4 — the response. Sentence **1** describes what Beijing now **proposes** to do, "faced with an ageing population" — the consequence of falling births and rising deaths. A policy response closes the paragraph.

Step 5 — the sequence.

$3 \to 4 \to 2 \to 1$

Answer: 3421

Shortcut

Facts before response: three sentences give statistics and one describes a policy, so the policy sentence closes. Among the statistics, only 3 names "China" in full, so it opens — and "At the same time" in 2 cannot be second.

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READING PASSAGE

Passage 3 – Conversation analysis: the Nile, geometry and governance

Host: We often think of Ancient Egypt as a product of divine kingship, but you argue it was a product of logistical necessity. How did the geography of the Nile dictate Egypt's economic and political structure?

Guest: The Nile is a unique geographical corridor. Unlike the Mesopotamian rivers, which were unpredictable, the Nile flooded with remarkable regularity. This created a specific "if-then" logic for administration. If the flood reached 'X' height, you would have an abundance of grain; if it reached 'Y', you faced famine and so forth. This correlation between the flood level and agrarian yield enabled the first high-level systemic inferencing in history. A Nilometer was used to measure the Nile's water levels and helped officials forecast harvest quality, anticipate famine or abundance, and calculate tax levies based on the flood height, often considered ideal at 16 cubits.

Host: You also stated that the geography and the geometry created a centralized "logic-gate" in the operation of the state. Am I correct?

Guest: Exactly. Because the Nile is a single linear artery, whoever controlled the river controlled all transport and communication. In a forest or a vast plain, a rebellious group might hide or move. In the Nile Valley, there is nowhere to go but the desert. This geographical confinement gave the government immense agency. They could tax with 100% efficiency because they knew exactly how much land was fertile each year based on the flood levels. Furthermore, the need to re-survey land after the silt covered the boundaries every year forced the development of geometry. Geometry wasn't just abstract math; it was a practical tool for efficient governance. The fit between geography, geometry and governance was so tight that the Egyptian state remained fundamentally stable for 3,000 years, an endurance record no modern business or nation has ever approached.

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APPENDIX

Topic notes

The concepts this paper leaned on, pulled out of the solutions and written as revision notes. Read them after you have attempted the paper, not before.

Arithmetic

Time, speed and distance *(Q2, Q16)* — For a head start plus an early finish, the total time difference is the **sum** of the two gaps. On a circular track, write down separately the distances at which *each* runner is at the target point, then equate times — meeting *somewhere* and meeting *at a named point* are different questions.

Profit, loss and discount *(Q4)* — $SP = MP(1-d)$ and $SP = CP(1+p)$. Work in totals for the whole lot and divide by the count only at the very end.

Compound interest *(Q8)* — Convert to the compounding period first: $r\%$ per annum compounded semi-annually means $\frac{r}{2}$ per period and $2n$ periods. With a mid-term repayment, grow to that date, subtract, then grow the remainder.

Ratio and proportion *(Q6)* — Introduce a single multiplier k and write every later stage in terms of it. Read "replaced" carefully: it changes **both** sides of the ratio.

Percentage *(Q9)* — "$x\%$ higher than y" means $y\left(1+\frac{x}{100}\right)$, not $\frac{x}{100}y$. That one reading decides several marks each year.

Alternate-day work *(Q18)* — Scale the job to the lcm, find the work done in one two-day block, run whole blocks, then finish day by day. The answer is almost always a mixed fraction.

Mean and median *(Q32)* — For n even, the median is the average of the two middle values **after sorting**. Deriving the mean symbolically once makes repeated testing fast.

Algebra

Quadratics and common roots *(Q3)* — If two quadratics share a root, that root must satisfy both; factorise the one you can and test each root. Separately, y^2+by is minimised by completing the square: minimum $-\frac{b^2}{4}$.

Sequences and series *(Q13, Q26, Q29)* —

$$\text{AP: } t_n = a + (n-1)d \qquad \text{GP: } S_\infty = \frac{a}{1-r} \quad (|r|<1)$$

An "nth term equals T" question is a **divisor** question: d must divide $T-a$. For a spiral with a cyclic direction pattern of period 4, group by direction and use $1-r^4 = (1-r^2)(1+r^2)$; each axis then collapses to $\frac{\text{first leg}}{1+r^2}$.

Logarithms *(Q28, Q37)* — Reduce every number to a common prime base and let one symbol (say $t = \log_2 3$) carry the algebra. For "sufficiently large n", drop additive constants: $\log\frac{9n^2}{n^2+1} \to \log 9$.

Polynomials *(Q27)* — When a quartic is given as a product of two quadratics, expand and compare coefficients. Use the **linear** relations first; they pin the unknowns without any quadratic work.

Algebraic identities *(Q33)* — For symmetric expressions in x and y, substitute $t = x/y$. Note $\frac{x^2+y^2}{xy} = t + \frac{1}{t}$, which is always ≥ 2 for positive t.

Inequalities and modulus *(Q15)* — Settle the **domain** first (square roots must be positive, log bases must be valid). To compare two moduli, square both sides — it is safe because both are non-negative.

Functions, max and min *(Q23)* — For $\max\ (\ldots) = c$, set each candidate equal to c in turn and **check the others do not exceed** c. That verification step is the question.

Graphs *(Q25)* — $2^x = x^2$ has three roots, not two. Sketch rather than solve: an exponential and an even power cross once on the negative side as well.

Number system

Remainders and cyclicity *(Q5)* — Factor common powers out first, then find the cycle length of the base. Useful: $7^3 \equiv 1\ (mod\, 9)$.

Quadratic residues *(Q39)* — Squares modulo 6 are only $0, 1, 3, 4$ — never 2 or 5. Build the small table of squares mod 4, 6, 8 once; it resolves a whole family of questions.

GCD counting *(Q17)* — $\gcd\ (n, N) = d$ means $n = dm$ with $\gcd\ (m, N/d) = 1$. Then count the m coprime to that quotient.

Primes *(Q35)* — If a prime p divides a product of primes, one of them **is** p. And $pq - p - q = k$ should always be rewritten $(p-1)\,(q-1) = k+1$.

Geometry and coordinate geometry

Cyclic quadrilaterals *(Q1)* — Opposite angles sum to 180°, so a right angle at one vertex forces a right angle at the opposite one. Memorise the triples 3–4–5, 5–12–13, 7–24–25, 8–15–17 and their multiples.

Circles *(Q19, Q21, Q31)* — Through three points, use $x^2 + y^2 + Dx + Ey + F = 0$ and $r = \frac{1}{2}\sqrt{D^2 + E^2 - 4F}$; or find the centre on the perpendicular bisector of a chord. For $x^2 + y^2 = 2ax + 2by$, the intercepts are $2a$ and $2b$, and the chord is $\frac{x}{2a} + \frac{y}{2b} = 1$.

Inscribed figures *(Q30)* — A square inscribed in a circle has the **diameter** as its diagonal, so side $= R\sqrt{2}$ and perimeter $= 4R\sqrt{2}$.

Lattice points *(Q36)* — Count column by column and use symmetry; only the non-negative half needs thought.

Modern maths

Counting *(Q11, Q34)* — Count the **complement** when the condition has many cases. For coin combinations, look for a parity or divisibility constraint that eliminates half the variables first.

Probability *(Q22, Q40)* — When a condition is given ("the sum is 10"), the denominator is the restricted count, not 6^3. For "at least" near a maximum, count downward from the top.

Set theory *(Q24, Q38)* —

$n(A \cup B) = n(A) + n(B) - n(A \cap B)$

For three sets, **exactly one** $= \sum \text{singles} - 2\sum \text{pairs} + 3\ (\text{triple})$. For a minimum, push the overlap to the smallest value the constraints permit.

Matrices and determinants *(Q7, Q20)* — The Vandermonde determinant $\begin{vmatrix} 1 & 1 & 1 \\ a & b & c \\ a^2 & b^2 & c^2 \end{vmatrix} = (b-a)(c-a)(c-b)$, so it vanishes exactly when two variables are equal. For a triangular matrix the determinant is the product of the diagonal, whatever the off-diagonal entries.

Logical reasoning and DI

Distribution puzzles *(Q10, Q12, Q14)* — When a group must take all available subsets of a given size, the remaining people are forced. Answer from **counts**; you rarely need to know which person holds which set.

Table DI *(Q41–Q45)* — Compute thresholds (15%, 50%) once, then scan. A **zero** in any column is the most powerful entry on the table — it forces every unit of that nutrient to come from elsewhere. For "minimum servings", take the **largest** of the per-nutrient requirements and round up.

Verbal ability

Reading comprehension — Match the technique to the question type:

Type	What to do
Detail / fact	Locate the single sentence; everything else is noise
Inference	Find the consequence the writer leaves unstated
Vocabulary in context	The definition is usually in the neighbouring sentence, often by contrast
EXCEPT / NOT	Three options are supported; find the one that reverses the text
Phrase meaning	Unpack the metaphor into its parts and match **all** of them
Application	Take the stated rule and run it one step further

A recurring 2026 trap: options that describe the **wrong party**. In Passage 1, three options about the English sparrow actually describe the native birds. Always ask *whose* behaviour an option names.

Idioms *(Q58, Q60, Q61, Q64)* — From this paper: *cost an arm and a leg* (very expensive), *let the cat out of the bag* (reveal a secret), *set the cat among the pigeons* (cause a commotion), *play cat and mouse* (toy with someone), *keep one's head* (stay calm), *to make matters worse*.

Commonly confused words *(Q59, Q62, Q63, Q65, Q69, Q79)* — *calumnious* (slanderous) vs *calamitous* / *callous* / *careless*; *gregarious* (sociable) vs *garrulous* (talkative); *recuse* (withdraw from a case) vs *recant* / *refrain* / *recoup*; *counsellor* (adviser) vs *councillor* (council member); *credulity* (gullibility of the believer) vs *credibility* (believability of the claim).

Grammar *(Q66, Q67, Q68)* —

- **Parallelism**: every verb joined by *and* after one "to" must be a bare infinitive.
- **Conditional inversion**: *Should she win..., no one would doubt...* equals *If she should win....* A *would* main clause demands a hypothetical conditional.
- **Two-error questions**: decide each error independently, then take the option satisfying both.

Para completion *(Q70–Q73)* — The answer is fixed by the sentences on **both** sides. Look for the connective the blank must supply (*Yet*, *This way*), and check that the inserted sentence does not make the following sentence

redundant — the commonest trap is an option that states the consequence the next sentence is about to state.

Cloze *(Q74–Q79)* — Find the blank with the tightest constraint and eliminate on it alone: a required preposition ("indifferent **to**"), a fixed collocation ("hothouse **atmosphere**"), or a synonym planted later in the passage ("irreplaceability" → *indispensable*). Read to the end before filling anything in.

Para jumbles *(Q86–Q90)* — Three moves, in order:

1. **Opener** — the only sentence naming its subject in full, with no backward-pointing pronoun.
2. **Mandatory pair** — a demonstrative or superlative and the thing it refers to ("Three songs" → "The most popular"), or a connective and what it contrasts with.
3. **Closer** — a policy response, a summary, or a sentence beginning *also* / *There are other…*, which cannot come first.

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