



PRACTICE TEST · CLASSES 1 AND 2

Maths Olympiad Practice Test for Classes 1 and 2

Twenty questions in the four sections of the SOF IMO paper for young children: logical reasoning, mathematical reasoning, everyday maths and the achievers section. Take it here and check the answers, or print it for the table.

Maths Olympiad

Primary

01 Before you start**Time** – 30 minutes, with a clock in view**Marks** – 1 mark for each question in Sections 1 to 3 and 2 marks in the Achievers section: 23 marks in all**Wrong answers** – no marks are taken off, so answer every question**The real paper** – the SOF IMO for Classes 1 to 4 has 35 questions for 40 marks in 60 minutes**02 Logical reasoning**

1 mark each

- 1 What comes next? 2, 4, 6, 8, ____
(A) 9 (B) 12 (C) 10 (D) 11
- 2 Which one is the odd one out?
(A) Apple (B) Carrot (C) Mango (D) Banana
- 3 Riya is taller than Aman. Aman is taller than Sara. Who is the shortest?
(A) Sara (B) Aman
(C) Riya (D) We cannot tell
- 4 What comes next? ○ △ □ ○ △ □ ○ △ ____
(A) ○ (B) △ (C) ☆ (D) □
- 5 Today is Monday. What day will it be after 2 days?
(A) Tuesday (B) Wednesday
(C) Thursday (D) Sunday

03 Mathematical reasoning

1 mark each

- 6 $15 + 7 =$ ____
(A) 21 (B) 23 (C) 12 (D) 22
- 7 Which number is the greatest?
(A) 89 (B) 79 (C) 98 (D) 97

- 8 How many tens are there in 60?
(A) 6 (B) 60 (C) 10 (D) 16
- 9 Find the missing number: $9 - \underline{\quad} = 4$
(A) 4 (B) 5 (C) 13 (D) 3
- 10 Which number comes between 46 and 48?
(A) 45 (B) 49 (C) 47 (D) 44
- 11 How many corners does a triangle have?
(A) 3 (B) 4 (C) 2 (D) 5

04 Everyday mathematics

1 mark each

- 12 Meena has 3 bags with 5 marbles in each bag. How many marbles does she have in all?
(A) 8 (B) 10 (C) 35 (D) 15
- 13 One pencil costs ₹5. How much do 4 pencils cost?
(A) ₹9 (B) ₹20 (C) ₹15 (D) ₹25
- 14 Which ribbon is the longest?
(A) 1 metre (B) 90 centimetres
(C) 2 metres (D) 50 centimetres
- 15 School starts at 8 o'clock. Lunch is 3 hours later. When is lunch?
(A) 11 o'clock (B) 10 o'clock
(C) 12 o'clock (D) 5 o'clock
- 16 Ravi had 20 stickers and gave 8 to his sister. How many does he have left?
(A) 28 (B) 12 (C) 10 (D) 18
- 17 How many days are there in a week?
(A) 5 (B) 6 (C) 10 (D) 7

- 18 I am a number. If you add 10 to me, you get 25. What number am I?

(A) 35 (B) 5 (C) 15 (D) 10

- 19 There are 4 cars and 3 bicycles in a car park. How many wheels are there in all?

(A) 22 (B) 7 (C) 14 (D) 19

- 20 Tom is 7th in a line from the front. There are 3 children behind him. How many children are in the line?

(A) 11 (B) 9 (C) 4 (D) 10

Answers and explanations

- 1 **C** The numbers go up by 2 each time: $8 + 2 = 10$.
- 2 **B** A carrot is a vegetable. Apples, mangoes and bananas are fruits.
- 3 **A** Riya is taller than Aman, and Aman is taller than Sara, so Sara is the shortest.
- 4 **D** The three shapes repeat in the same order: circle, triangle, square.
- 5 **B** One day after Monday is Tuesday; two days after is Wednesday.
- 6 **D** $15 + 5 = 20$, and 2 more makes 22.
- 7 **C** 98 has the most tens (9 tens) and more ones than 97.
- 8 **A** $60 = 6$ tens.
- 9 **B** $9 - 5 = 4$. Check: $4 + 5 = 9$.
- 10 **C** Counting on: 46, 47, 48.
- 11 **A** A triangle has 3 sides and 3 corners.
- 12 **D** $5 + 5 + 5 = 15$ (or $3 \times 5 = 15$).
- 13 **B** $₹5 + ₹5 + ₹5 + ₹5 = ₹20$.
- 14 **C** 1 metre is 100 centimetres, so 2 metres (200 centimetres) is the longest.
- 15 **A** Count on 3 hours from 8: 9, 10, 11.
- 16 **B** $20 - 8 = 12$.
- 17 **D** Monday to Sunday: 7 days.
- 18 **C** $25 - 10 = 15$. Check: $15 + 10 = 25$.
- 19 **A** Cars: $4 \times 4 = 16$ wheels. Bicycles: $3 \times 2 = 6$ wheels. $16 + 6 = 22$.
- 20 **D** 7 children up to and including Tom, and 3 behind him: $7 + 3 = 10$.

How to use this test

- 1 Read each question twice before choosing an answer.
- 2 Draw or count on your fingers for the word problems.
- 3 Practise one section a day, then take the whole test with a clock.

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PRACTICE TEST · CLASSES 3 TO 5

Maths Olympiad Practice Test for Classes 3 to 5

Twenty-five questions in the four sections of the SOF IMO paper: logical reasoning, mathematical reasoning, everyday mathematics and the achievers section. Take it here and check your score, or print it and time yourself.

Maths Olympiad

Primary

01 Before you start**Time** – 30 minutes, with a clock in view**Marks** – 1 mark for each question in Sections 1 to 3 and 2 marks in the Achievers section: 29 marks in all**Wrong answers** – no marks are taken off, so answer every question**The real paper** – the SOF IMO has 35 questions for 40 marks for Classes 3 and 4, and 50 questions for 60 marks from Class 5, in 60 minutes**02 Logical reasoning**

1 mark each

- 1 Find the next number: 3, 6, 12, 24, ____
(A) 36 (B) 48 (C) 42 (D) 30
- 2 Find the missing number: 1, 4, 9, 16, 25, ____
(A) 30 (B) 34 (C) 36 (D) 49
- 3 If CAT is written as DBU, how is DOG written?
(A) EPH (B) CNF (C) EPG (D) DPH
- 4 Rohan faces north and turns right. Then he turns right again. Which way is he facing now?
(A) North (B) East (C) West (D) South
- 5 In a class of 30 children, Neha is 12th from the top. What is her rank from the bottom?
(A) 18th (B) 19th (C) 20th (D) 17th
- 6 Bird is to nest as bee is to ____
(A) honey (B) flower (C) hive (D) wing

03 Mathematical reasoning

1 mark each

- 7 What is the place value of 7 in 47,382?
(A) 7 (B) 700 (C) 70,000 (D) 7,000

- 8 Which fraction is the largest?
(A) $\frac{1}{2}$ (B) $\frac{3}{4}$ (C) $\frac{1}{3}$ (D) $\frac{2}{5}$
- 9 What is the LCM of 4 and 6?
(A) 12 (B) 2 (C) 24 (D) 10
- 10 Round 3,467 to the nearest hundred.
(A) 3,400 (B) 3,470 (C) 3,500 (D) 4,000
- 11 Which of these is a prime number?
(A) 21 (B) 27 (C) 33 (D) 29
- 12 The perimeter of a square is 36 cm. How long is each side?
(A) 6 cm (B) 9 cm (C) 12 cm (D) 18 cm
- 13 How many lines of symmetry does a rectangle that is not a square have?
(A) 2 (B) 1 (C) 4 (D) 0
- 14 $0.5 + 0.25 =$ ____
(A) 0.30 (B) 0.525 (C) 0.75 (D) 0.70

04 Everyday mathematics

1 mark each

- 15 A film starts at 4:45 pm and lasts 1 hour 50 minutes. When does it end?
(A) 6:25 pm (B) 6:45 pm (C) 5:35 pm (D) 6:35 pm
- 16 Aarav saves ₹25 every week. How much will he save in 12 weeks?
(A) ₹250 (B) ₹300 (C) ₹275 (D) ₹325
- 17 A box holds 24 crayons. How many boxes are needed to pack 150 crayons?
(A) 7 (B) 6 (C) 8 (D) 5
- 18 3 notebooks cost ₹90. What do 5 notebooks cost?
(A) ₹120 (B) ₹135 (C) ₹150 (D) ₹180

19 Which is heavier: 1 kg of cotton or 1,000 g of iron?

- (A) Neither: they weigh the same
- (B) Cotton
- (C) Iron
- (D) We cannot tell

20 A garden is 12 m long and 8 m wide. What is its area?

- (A) 40 m²
- (B) 20 m²
- (C) 80 m²
- (D) 96 m²

21 A 45-minute class starts at 10:00 am and is followed by a 15-minute break. When does the break end?

- (A) 10:45 am
- (B) 11:00 am
- (C) 11:15 am
- (D) 11:45 am

05 Achievers section

2 marks each

22 Three numbers in a row (like 4, 5, 6) add up to 48. What is the largest of them?

- (A) 15
- (B) 16
- (C) 18
- (D) 17

23 How many squares of any size are there in a 2×2 grid of squares?

- (A) 5
- (B) 4
- (C) 6
- (D) 8

24 A number is multiplied by 6 and then 4 is taken away. The answer is 50. What is the number?

- (A) 8
- (B) 9
- (C) 7
- (D) 10

25 Ria has 12 coins, some ₹10 and some ₹5. Together they are worth ₹95. How many ₹10 coins does she have?

- (A) 5
- (B) 6
- (C) 7
- (D) 8

Answers and explanations

- 1 **B** Each number is double the one before: $24 \times 2 = 48$.
- 2 **C** These are square numbers: 1×1 , 2×2 , 3×3 and so on, so the next is $6 \times 6 = 36$.
- 3 **A** Each letter moves one step forward in the alphabet: D $\rightarrow$ E, O $\rightarrow$ P, G $\rightarrow$ H.
- 4 **D** North, turn right: east. Turn right again: south.
- 5 **B** Rank from the bottom = $30 - 12 + 1 = 19$.
- 6 **C** A bird lives in a nest; a bee lives in a hive.
- 7 **D** 7 is in the thousands place: $7 \times 1,000 = 7,000$.
- 8 **B** $3/4 = 0.75$, which is more than $1/2 = 0.5$, $2/5 = 0.4$ and $1/3$.
- 9 **A** Multiples of 4: 4, 8, 12 ... Multiples of 6: 6, 12 ... The first number in both lists is 12.
- 10 **C** The tens digit is 6, which is 5 or more, so round up to 3,500.
- 11 **D** $21 = 3 \times 7$, $27 = 3 \times 9$ and $33 = 3 \times 11$, but 29 has no factors except 1 and itself.
- 12 **B** A square has 4 equal sides: $36 \div 4 = 9$ cm.
- 13 **A** One line across the middle and one down the middle. The diagonals are not lines of symmetry.
- 14 **C** Line up the decimal points: $0.50 + 0.25 = 0.75$.
- 15 **D** $4:45 + 1$ hour = $5:45$, and 50 minutes more is $6:35$.
- 16 **B** $25 \times 12 = 300$.
- 17 **A** 6 boxes hold 144 crayons. The other 6 crayons need one more box: 7 boxes.
- 18 **C** One notebook costs $90 \div 3 = ₹30$, so 5 cost ₹150.
- 19 **A** 1 kg = 1,000 g, so both weigh the same.
- 20 **D** Area of a rectangle = length $\times$ width = $12 \times 8 = 96$ square metres.
- 21 **B** $45 + 15 = 60$ minutes, so the break ends one hour after 10:00, at 11:00.
- 22 **D** $48 \div 3 = 16$ is the middle number, so the numbers are 15, 16 and 17.
- 23 **A** 4 small squares and 1 big square: 5.
- 24 **B** Work backwards: $50 + 4 = 54$, and $54 \div 6 = 9$.
- 25 **C** If all 12 were ₹5 coins they would make ₹60. Each ₹10 coin adds ₹5 more, and she needs ₹35 more: $35 \div 5 = 7$.

How to use this test

- 1 Do the questions you are sure of first, then come back to the rest.
- 2 Check answers by working backwards, as in question 24.
- 3 Learn tables to 20 and squares to 15×15 : they save time in every section.

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PRACTICE TEST · CLASSES 6 TO 8

Maths Olympiad Practice Test for Classes 6 to 8

Twenty-five questions in the four sections of the SOF IMO paper, at Class 6 to 8 level: logical reasoning, mathematical reasoning, everyday mathematics and the achievers section, with an explanation for every answer.

Maths Olympiad**01 Before you start**

Time – 30 minutes, with a clock in view

Marks – 1 mark for each question in Sections 1 to 3 and 3 marks in the Achievers section: 33 marks in all

Wrong answers – no marks are taken off, so answer every question

The real paper – the SOF IMO for Classes 5 to 12 has 50 questions for 60 marks in 60 minutes

02 Logical reasoning

1 mark each

- 1 Find the next number: 2, 6, 12, 20, 30, ____
(A) 40 (B) 42 (C) 44 (D) 36
- 2 Find the odd one out.
(A) 121 (B) 169 (C) 210 (D) 196
- 3 In a code, MATH is written as NBUI. How is SCORE written?
(A) RBNQD (B) TDPSF (C) TDPRF (D) UEQTG
- 4 Pointing to a man, Anu says, 'He is the son of my grandfather's only son.' How is the man related to Anu?
(A) Father (B) Uncle (C) Cousin (D) Brother
- 5 What is the angle between the hands of a clock at 3:30?
(A) 75° (B) 90° (C) 60° (D) 105°
- 6 1 January of a non-leap year is a Monday. What day is 1 February?
(A) Wednesday (B) Friday
(C) Thursday (D) Tuesday

03 Mathematical reasoning

1 mark each

- 7 What is the HCF of 84 and 126?
(A) 14 (B) 21 (C) 84 (D) 42

- 8 $(-3) \times (-4) - (-5) =$ ____
(A) 17 (B) 7 (C) -17 (D) -7
- 9 If $3x - 7 = 2x + 5$, then $x =$ ____
(A) 2 (B) -2 (C) 12 (D) 5
- 10 $2^5 \times 2^3 \div 2^6 =$ ____
(A) 2 (B) 4 (C) 8 (D) 16
- 11 The angles of a triangle are in the ratio 2 : 3 : 4. What is the largest angle?
(A) 60° (B) 90° (C) 100° (D) 80°
- 12 $\sqrt{1764} =$ ____
(A) 38 (B) 42 (C) 44 (D) 48
- 13 Which is the smallest?
(A) $\frac{2}{5}$ (B) $\frac{3}{7}$ (C) $\frac{4}{9}$ (D) $\frac{5}{11}$
- 14 How many diagonals does a hexagon have?
(A) 6 (B) 12 (C) 9 (D) 15

04 Everyday mathematics

1 mark each

- 15 A shirt marked ₹800 is sold at 15% off. What is the selling price?
(A) ₹650 (B) ₹720 (C) ₹785 (D) ₹680
- 16 A car travels 180 km in 3 hours. At the same speed, how far does it go in 5 hours?
(A) 300 km (B) 250 km (C) 320 km (D) 360 km
- 17 What is the simple interest on ₹5,000 at 8% a year for 3 years?
(A) ₹1,000 (B) ₹1,400 (C) ₹1,200 (D) ₹6,200
- 18 The average of five numbers is 24. When one number is removed, the average of the other four is 22. Which number was removed?
(A) 30 (B) 32 (C) 34 (D) 28

- 19 One pipe fills a tank in 6 hours and another in 3 hours. How long do they take together?

(A) 1.5 hours (B) 4.5 hours
(C) 9 hours (D) 2 hours

- 20 A recipe uses flour and sugar in the ratio 5 : 2. How much sugar goes with 750 g of flour?

(A) 250 g (B) 350 g (C) 300 g (D) 375 g

- 21 A cube has 4 cm edges. What is its total surface area?

(A) 96 cm^2 (B) 64 cm^2 (C) 48 cm^2 (D) 16 cm^2

05 Achievers section

3 marks each

- 22 What is the remainder when 2^{10} is divided by 7?

(A) 1 (B) 3 (C) 2 (D) 4

- 23 How many whole numbers from 1 to 100 are divisible by 3 or by 5?

(A) 53 (B) 47 (C) 45 (D) 50

- 24 The digits of a two-digit number add up to 9. Reversing the digits gives a number 27 more. What is the number?

(A) 27 (B) 45 (C) 63 (D) 36

- 25 A square and an equilateral triangle have the same perimeter. Each side of the triangle is 12 cm. What is the area of the square?

(A) 81 cm^2 (B) 144 cm^2 (C) 64 cm^2 (D) 36 cm^2

Answers and explanations

- 1 **B** The gaps are 4, 6, 8, 10, so the next gap is 12: $30 + 12 = 42$. (Each term is $n \times (n + 1)$.)
- 2 **C** $121 = 11^2$, $169 = 13^2$ and $196 = 14^2$, but 210 is not a perfect square.
- 3 **B** Each letter moves one step forward: $S \rightarrow T$, $C \rightarrow D$, $O \rightarrow P$, $R \rightarrow S$, $E \rightarrow F$.
- 4 **D** Her grandfather's only son is her father, and her father's son is her brother.
- 5 **A** The minute hand is at 180° . The hour hand is halfway between 3 and 4, at 105° . $180^\circ - 105^\circ = 75^\circ$.
- 6 **C** January has 31 days, which is 4 weeks and 3 days, so 1 February is 3 days on from Monday: Thursday.
- 7 **D** $84 = 2^2 \times 3 \times 7$ and $126 = 2 \times 3^2 \times 7$, so the HCF is $2 \times 3 \times 7 = 42$.
- 8 **A** $(-3) \times (-4) = 12$, and $12 - (-5) = 12 + 5 = 17$.
- 9 **C** Take $2x$ from both sides: $x - 7 = 5$, so $x = 12$.
- 10 **B** Add and subtract the powers: $5 + 3 - 6 = 2$, and $2^2 = 4$.
- 11 **D** $2 + 3 + 4 = 9$ parts make 180° , so one part is 20° and the largest angle is $4 \times 20^\circ = 80^\circ$.
- 12 **B** $40^2 = 1600$ and $42^2 = 1764$.
- 13 **A** As decimals: $2/5 = 0.40$, $3/7 \approx 0.43$, $4/9 \approx 0.44$ and $5/11 \approx 0.45$.
- 14 **C** A polygon with n sides has $n(n - 3)/2$ diagonals: $6 \times 3 \div 2 = 9$.
- 15 **D** 15% of 800 is 120, and $800 - 120 = 680$.
- 16 **A** Speed = $180 \div 3 = 60$ km an hour, so in 5 hours it goes 300 km.
- 17 **C** $5,000 \times 8 \times 3 \div 100 = 1,200$. (₹6,200 is the total amount, not the interest.)
- 18 **B** The five add up to $5 \times 24 = 120$ and the four to $4 \times 22 = 88$, so the removed number is $120 - 88 = 32$.
- 19 **D** In one hour they fill $1/6 + 1/3 = 1/2$ of the tank, so together they take 2 hours.
- 20 **C** One part is $750 \div 5 = 150$ g, so 2 parts of sugar are 300 g.
- 21 **A** 6 faces, each $4 \times 4 = 16$ square cm: $6 \times 16 = 96$. (64 is the volume in cubic cm.)
- 22 **C** $2^{10} = 1024 = 7 \times 146 + 2$. (Or: $2^3 = 8$ leaves 1, so 2^9 leaves 1 and 2^{10} leaves 2.)
- 23 **B** 33 multiples of 3, plus 20 multiples of 5, minus the 6 multiples of 15 counted twice: $33 + 20 - 6 = 47$.
- 24 **D** Reversing adds $9 \times$ (difference of the digits), so the digits differ by 3 and add up to 9: 3 and 6, giving 36. Check: $63 - 36 = 27$.
- 25 **A** The perimeter is $3 \times 12 = 36$ cm, so the square's side is 9 cm and its area 81 square cm.

How to use this test

- 1 Time yourself: 30 minutes for this test is the pace of the real paper.
- 2 In the achievers section, write down what you know before you calculate.
- 3 Keep a notebook of every question you got wrong, with the right method.

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PRACTICE GUIDE · CLASSES 3 TO 8

Logical Reasoning for Olympiads: Rules and Practice

The logical reasoning section opens the SOF Maths and Science Olympiad papers, and school never teaches it. Here are the rules for each question type, then 15 practice questions with answers.

Maths Olympiad

Science Olympiad

Study skills

01 Number and letter series

Check the gaps – 3, 7, 11, 15 goes up by 4 each time

Look for multiplying – 2, 6, 18, 54 is $\times 3$ each time

Squares and cubes – 1, 4, 9, 16 are squares; 1, 8, 27, 64 are cubes

Gaps that grow – 2, 6, 12, 20 has gaps 4, 6, 8: the next gap is 10

Two series in one – 1, 10, 2, 20, 3, 30 alternates two patterns

Letters – number them A = 1 to Z = 26 and work with the numbers

Opposite letters – A and Z, B and Y: each pair adds up to 27

02 Coding and decoding

Shift codes – CAT → DBU moves every letter one step forward

Reverse codes – the word is written backwards, then the rule is applied

Number codes – letters become their positions: BAD → 2 1 4

Matching codes – find a letter that appears in two coded words to fix its code

Test your rule – check it on every letter you are given before answering

03 Directions

Draw it – sketch a compass with north at the top and east on the right

Turns – facing north, a right turn faces east and a left turn faces west

Two right turns – face the opposite way

Shadows – in the morning the Sun is in the east, so shadows fall to the west

Straight-line distance – if the walk makes a right angle, use Pythagoras: 3, 4, 5

04 Ranking and order

From the other end – position = total – position from this end + 1

Total in a row – position from the left + position from the right – 1

Comparisons – write the names in a line, tallest to shortest, as you read

05 Relations

Family tree – draw it: a line down for children, = for a married couple

Grandfather's only son – is the father

Mother's only son – is the speaker himself, if the speaker is a boy

Mother's brother – is the maternal uncle

06 Analogies and odd one out

Find the link first – worker and tool, animal and home, young one, opposite, part and whole

Odd one out – test groups such as fruit or vegetable, prime or not, bird or mammal

Check every option – the link must work for all the others, not just two

07 Clocks and calendars

Angle between the hands – $|30H - 5.5M|$ degrees at H hours and M minutes

Hands together – 11 times in 12 hours

Mirror image of a clock – 11:60 minus the time shown: 2:30 looks like 9:30

Odd days – an ordinary year moves the weekday on by 1, a leap year by 2

Leap years – divisible by 4; century years only if divisible by 400

08 Counting figures

Squares in an $n \times n$ grid – $1^2 + 2^2 + \dots + n^2$: 14 in a 3×3 grid

Triangles – count the small ones, then those made of two, three and more parts

Painted cube cut into $n \times n \times n$ – 8 cubes have three painted faces, $12(n - 2)$ have two, $6(n - 2)^2$ have one and $(n - 2)^3$ have none

Mirror images – left and right swap; water images :: top and bottom swap

09 Practice questions

1 mark each

- 1 Find the next number: 5, 11, 23, 47, ____
(A) 94 (B) 93 (C) 96 (D) 95
- 2 Find the next pair: AZ, BY, CX, ____
(A) DW (B) DV (C) EW (D) DX
- 3 If PEN is written as QFO, how is INK written?
(A) HMJ (B) JOL (C) JOK (D) KPM
- 4 Ravi faces south and turns right twice. Which way is he facing now?
(A) South (B) East (C) North (D) West
- 5 In a row of 25 children, Tina is 9th from the left. What is her position from the right?
(A) 16th (B) 18th (C) 15th (D) 17th
- 6 Kabir is 7th from the left and 12th from the right in a row. How many children are in the row?
(A) 18 (B) 19 (C) 17 (D) 20
- 7 Pointing to a girl, Arjun says, 'She is the daughter of my mother's only son.' How is the girl related to Arjun?
(A) Sister (B) Daughter
(C) Niece (D) Cousin
- 8 Book is to library as painting is to ____
(A) artist (B) brush (C) gallery (D) frame
- 9 Find the odd one out.
(A) 3 (B) 5 (C) 11 (D) 9
- 10 What is the angle between the hands of a clock at 4:00?
(A) 120° (B) 90° (C) 100° (D) 150°
- 11 A clock seen in a mirror shows 2:30. What is the real time?
(A) 10:30 (B) 9:30 (C) 8:30 (D) 2:30
- 12 3 March is a Friday. What day is 24 March of the same year?
(A) Thursday (B) Saturday
(C) Friday (D) Sunday
- 13 How many squares of any size are there in a 3×3 grid?
(A) 9 (B) 12 (C) 13 (D) 14
- 14 A $4 \times 4 \times 4$ cube painted on every face is cut into 64 small cubes. How many small cubes have no painted face?
(A) 8 (B) 16 (C) 24 (D) 4
- 15 Some cats are black. All black things are shiny. Which must be true?
(A) All cats are shiny.
(B) Some cats are shiny.
(C) No cat is shiny.
(D) All shiny things are cats.

Answers and explanations

- | | |
|--|--|
| <p>1 D Each term is double the one before, plus 1: $47 \times 2 + 1 = 95$.</p> <p>2 A The first letter goes forward from A and the second goes back from Z.</p> <p>3 B Every letter moves one step forward: I $\rightarrow$ J, N $\rightarrow$ O, K $\rightarrow$ L.</p> <p>4 C South, turn right: west. Turn right again: north.</p> <p>5 D $25 - 9 + 1 = 17$.</p> <p>6 A $7 + 12 - 1 = 18$: Kabir is counted twice otherwise.</p> <p>7 B His mother's only son is Arjun himself, so the girl is his daughter.</p> | <p>8 C Books are kept in a library; paintings are kept in a gallery.</p> <p>9 D 3, 5 and 11 are prime numbers; $9 = 3 \times 3$.</p> <p>10 A Each hour mark is 30° apart: $4 \times 30^\circ = 120^\circ$.</p> <p>11 B Subtract from 11:60: $11:60 - 2:30 = 9:30$.</p> <p>12 C $24 - 3 = 21$ days, exactly 3 weeks, so it is also a Friday.</p> <p>13 D 9 small squares, 4 squares of 2×2 and 1 of 3×3: 14.</p> <p>14 A The unpainted cubes form the inner $2 \times 2 \times 2$ block: 8.</p> <p>15 B The black cats are black things, so they are shiny. Nothing is known about the other cats.</p> |
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How to use this guide

- 1 Always draw: a compass for directions, a line for ranks, a tree for relations.
- 2 Write the alphabet with its numbers (A = 1 to Z = 26) at the top of your rough sheet.
- 3 Do ten reasoning questions a day for a month before the Olympiad.

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