



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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