

FREE PRACTICE PACK · EDITION 1

Class 9 Mathematics Olympiad practice

16 original questions + explained answers

For students preparing for SOF IMO.

Inside this pack

Eight topic-practice questions and an eight-question, 25-minute mini-mock.

Topics selected for practice

- Number systems and algebra
- Coordinate geometry
- Geometry and mensuration
- Statistics and probability

How to use it

Try the practice first. Complete the mini-mock in one sitting. Check the explanations, mark mistakes, and retry them the next day.

This pack covers selected topics. It is original BodhiScore material, independent of SOF, and is not an official paper or a full-length exam. Check the official syllabus for the complete scope.

Topic practice

Work through these eight questions without a timer. Explain your choice before checking the solutions.

1. Number systems and algebra

If $x + 1/x = 3$, find $x^2 + 1/x^2$.

- | | |
|-------------|--------------|
| A. 9 | B. 11 |
| C. 5 | D. 7 |
-

2. Coordinate geometry

What is the distance between (1, 2) and (4, 6)?

- | | |
|-------------|-------------|
| A. 5 | B. 7 |
| C. 3 | D. 4 |
-

3. Geometry and mensuration

A triangle has sides 13 cm, 14 cm and 15 cm. What is its area?

- | | |
|-----------------------------|------------------------------|
| A. 96 cm^2 | B. 105 cm^2 |
| C. 72 cm^2 | D. 84 cm^2 |
-

4. Statistics and probability

Two fair coins are tossed. What is the probability of exactly one head?

- | | |
|-----------------|-----------------|
| A. $1/4$ | B. $1/2$ |
| C. $3/4$ | D. 1 |
-

Topic practice (continued)

5. Number systems and algebra

Solve $x^2 - 7x + 12 = 0$.

A. $x=-3$ or -4

B. $x=1$ or 12

C. $x=2$ or 6

D. $x=3$ or 4

6. Coordinate geometry

A line passes through $(0, 3)$ and $(2, 7)$. What is its slope?

A. 1

B. 2

C. 3

D. 4

7. Geometry and mensuration

A circle has radius 5 cm. What is the area of a 90-degree sector?

A. $10\pi \text{ cm}^2$

B. $25\pi \text{ cm}^2$

C. $25\pi/4 \text{ cm}^2$

D. $5\pi \text{ cm}^2$

8. Statistics and probability

The mean of 5 numbers is 12. Four are 8, 10, 13 and 15. Find the fifth.

A. 15

B. 16

C. 12

D. 14

Timed mini-mock

Set a 25-minute timer for these eight questions. Score 1 point per correct answer; there is no penalty for an incorrect answer. This is BodhiScore's practice scoring.

9. Number systems and algebra

For positive x , if $x^2 = 5$, what is $(x + 1/x)^2$?

- A. 7
 - B. 9
 - C. $36/5$
 - D. $5 + 2/\sqrt{5}$
-

10. Coordinate geometry

The midpoint of $(2, -1)$ and $(8, 5)$ is what?

- A. $(5, 2)$
 - B. $(6, 4)$
 - C. $(10, 4)$
 - D. $(3, 3)$
-

11. Geometry and mensuration

A cylinder has radius 3 cm and height 10 cm. Find its volume.

- A. $60\pi \text{ cm}^3$
 - B. $90\pi \text{ cm}^3$
 - C. $180\pi \text{ cm}^3$
 - D. $30\pi \text{ cm}^3$
-

Timed mini-mock (continued)

12. Statistics and probability

A bag has 4 red and 6 blue balls. Two balls are drawn without replacement. What is the probability both are red?

- | | |
|-------------------|------------------|
| A. $\frac{2}{15}$ | B. $\frac{1}{5}$ |
| C. $\frac{4}{25}$ | D. $\frac{1}{3}$ |
-

13. Number systems and algebra

If $a + b = 10$ and $ab = 21$, find $a^2 + b^2$.

- | | |
|--------|-------|
| A. 100 | B. 42 |
| C. 58 | D. 79 |
-

14. Coordinate geometry

A point with positive x-coordinate on the x-axis is 5 units from (2, 3). Which x-coordinate is it?

- | | |
|------|-------|
| A. 0 | B. 4 |
| C. 6 | D. -2 |
-

15. Geometry and mensuration

A cone has radius 3 cm and height 4 cm. What is its slant height?

- | | |
|---------|---------|
| A. 5 cm | B. 6 cm |
| C. 7 cm | D. 4 cm |
-

Timed mini-mock (continued)

16. Statistics and probability

A fair die is rolled. Given the result is even, what is the probability it is greater than 3?

A. $1/2$

B. $2/3$

C. 1

D. $1/3$

Answers and explanations

Check why the answer works, then retry any question you missed.

1. D - 7

Square the given sum: $x^2 + 2 + 1/x^2 = 9$, so the required value is 7.

2. A - 5

Distance = $\sqrt{(4-1)^2 + (6-2)^2} = \sqrt{9 + 16} = 5$.

3. D - 84 cm²

Heron's formula with semiperimeter 21 gives area $\sqrt{21 \times 8 \times 7 \times 6} = 84$ cm².

4. B - 1/2

The outcomes HT and TH are 2 of the 4 equally likely outcomes.

5. D - $x=3$ or 4

Factor as $(x - 3)(x - 4) = 0$.

6. B - 2

Slope = $(7 - 3)/(2 - 0) = 2$.

7. C - $25\pi/4$ cm²

A quarter of pi times 5 squared is $25\pi/4$ cm².

8. D - 14

The total is 60; the first four sum to 46, so the fifth is 14.

9. C - 36/5

$x^2 + 2 + 1/x^2 = 5 + 2 + 1/5 = 36/5$.

Answers and explanations (continued)

10. A - (5, 2)

Average the coordinates: $((2+8)/2, (-1+5)/2) = (5, 2)$.

11. B - $90\pi \text{ cm}^3$

Volume = $\pi r^2 h = \pi \times 9 \times 10 = 90\pi \text{ cm}^3$.

12. A - $2/15$

The probability is $(4/10)(3/9) = 12/90 = 2/15$.

13. C - 58

$a^2+b^2=(a+b)^2-2ab=100-42=58$.

14. C - 6

$(x-2)^2 + 3^2 = 25$ gives $x=-2$ or 6 ; the positive coordinate is 6 .

15. A - 5 cm

Slant height = $\sqrt{3^2 + 4^2} = 5 \text{ cm}$.

16. B - $2/3$

The even outcomes are 2, 4, 6; two of these are greater than 3, so probability is $2/3$.

Topic scope checked against SOF syllabus: [SOF IMO Class 9 syllabus](#)