

# 9<sup>th</sup> iOM'16

## International Olympiad of Mathematics



Presented by:  
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 New Delhi, India

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### CLASS : 9 (SYLLABUS & SAMPLE QUESTIONS)

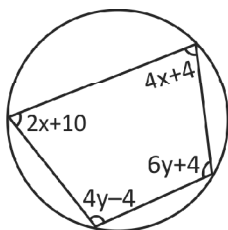
Real Numbers, Polynomials Logarithms, Linear Equation in Two Variables, Line & Angles, Triangles, Quadrilaterals, Trigonometry, Mensuration, Statistics, Probability, Coordinate Geometry, Circles, Mathematical Reasoning and Logical Ability, Applied Mathematics, Mental Aptitude

The Actual Question Paper Contains 50 Questions. The Duration of the Test Paper is 60 Minutes.

1. If  $x = \frac{7 - \sqrt{45}}{2}$ , find the value of  $x^3 + \frac{1}{x^3}$ .

- (A) 47  
 (B) 298  
 (C) 322  
 (D) 428  
 (E) None of these

2. From the given figure, find out the values of  $x$  and  $y$ .



- (A)  $x = 26, y = 19$   
 (B)  $x = 26, y = 29$   
 (C)  $x = 25, y = 20$   
 (D)  $x = 40, y = 25$   
 (E) None of these

3. What is the remainder when  $x + x^9 + x^{25} + x^{49} + x^{81}$  is divided by  $x^3 - x$ .

- (A)  $5x^2$                       (B)  $3x^2$   
 (C)  $4x$                         (D)  $5x$   
 (E) None of these

4. The sides of a quadrilateral taken in order are 26 cm, 27 cm, 7 cm and 24 cm. The angle between the last two sides is a right angle. Find the area of quadrilateral.

- (A)  $291.85 \text{ cm}^2$   
 (B)  $375.85 \text{ cm}^2$   
 (C)  $84 \text{ cm}^2$   
 (D)  $600\sqrt{15} \text{ cm}^2$   
 (E) None of these

5. The area of the region bounded by  $2x + y = 6$ ,  $2x - y + 2 = 0$  and  $x$ -axis is:

- (A) 4 sq. units  
 (B) 6 sq. units  
 (C) 8 sq. units  
 (D) 2 sq. units  
 (E) None of these

6. If  $\cos \theta = \frac{1}{\sqrt{2}}$ , then  $\frac{2\cos^2\theta + 3\tan^2\theta}{4\cot^2\theta - \sin^2\theta}$  is equal

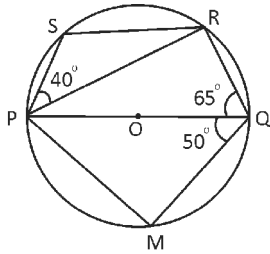
to

- (A)  $\frac{8}{7}$                               (B)  $\frac{8}{9}$   
 (C)  $\frac{9}{8}$                               (D)  $\frac{7}{8}$   
 (E) None of these

7. An aeroplane leaves an airport and flies due north at a speed of 1000 km/h. At same time, another plane flies due west at a speed of 1200 km/h from the same place. The approximate distance between the two planes after 1.5 hours will be:

- (A) 2400 km      (B) 2520 km  
 (C) 2343 km      (D) 2434 km  
 (E) None of these

8. If  $O$  is the centre of the circle, then measure of  $\angle QPM$  in the following figure is:

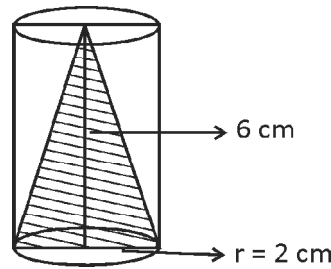


- (A)  $65^\circ$       (B)  $50^\circ$   
 (C)  $40^\circ$       (D)  $72^\circ$   
 (E) None of these

9. Three years ago, the mean age of Harison's family of 5 members was 17. A baby having been born, the average age of his family remains same today. The present age of the baby is:

- (A) 1 year      (B) 1.5 years  
 (C) 2.5 years      (D) 2 years  
 (E) None of these

10. The volume of the shaded region in the following figure is:



- (A)  $8\pi \text{ cm}^3$       (B)  $4\pi \text{ cm}^3$   
 (C)  $2\pi \text{ cm}^3$       (D)  $12\pi \text{ cm}^3$   
 (E) None of these

**ANSWERS**

1. (C)    2. (A)    3. (D)    4. (B)    5. (C)    6. (A)    7. (C)    8. (C)    9. (D)    10. (A)