



INTERNATIONAL
Olympiad of
Mathematics
2011

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Mathematics Olympiad Foundation (NGO)

CLASS : 9 (SYLLABUS & SAMPLE QUESTIONS)

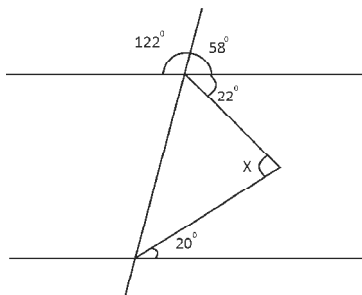
Real Numbers, Polynomials, Linear Equation in Two Variables, Line, Angles and Triangles, Quadrilaterals
Mensuration, Statistics, Probability, Mathematical Reasoning and Logical Ability, Coordinate Geometry
Circles, Applied Mathematics

The Actual Question Paper Contains 40 Questions. The Duration of the Test Paper is 60 Minutes.

1. The value of $\sqrt[4]{81} - 8\sqrt[3]{216}$ is

- (A) 0 (B) 12
(C) - 45 (D) 17
(E) None of these

2. The value of 'x' is



- (A) 58° (B) 22°
(C) 20° (D) 42°
(E) None of these

3. The remainder when $4x^4 - 3x^3 - 2x^2 + x - 7$ is divided by $x + \frac{2}{3}$

- (A) $-\frac{57}{8}$ (B) -3
(C) $-\frac{557}{81}$ (D) $\frac{221}{7}$
(E) None of these

6. If α and β are roots of $f(x) = x^2 + px + q$,

then the polynomial having roots $\frac{1}{\alpha}$ and

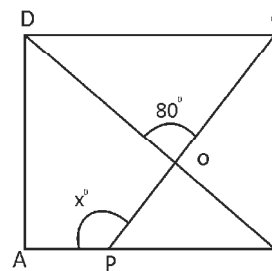
$\frac{1}{\beta}$ is

- (A) $x^2 + qx + p$ (B) $qx^2 + px + 1$
(C) $x^2 - px + q$ (D) $px^2 + qx + 1$
(E) None of these

5. If $(x - 3)$ and $(x + 2)$ are the factors of $x^3 + hx^2 - kx - 30$, then h and k are respectively

- (A) (4, 11) (B) (4, 8)
(C) (7, 11) (D) (7, 8)
(E) None of these

4. If ABCD is a square, then the value of 'x' is

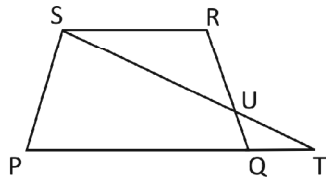


- (A) 80° (B) 115°
(C) 125° (D) 135°
(E) None of these

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

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

8. In the given figure



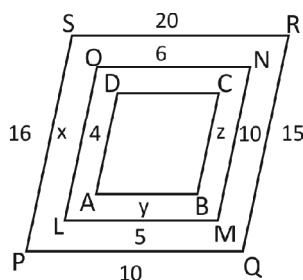
PQRS is a quadrilateral in which $PQ \parallel RS$. A line segment ST which passes through the mid point of QR meet at point T when PQ produced. Then

- (A) $PT = PQ + SR$
(B) $PQ + QR = ST$
(C) $\angle P + \angle Q + \angle T + \angle S = 360^\circ$
(D) $PS + SR + RQ > PT + ST + PQ$
(E) None of these

9. A two digit number is obtained by either multiplying the sum of digit by 8 and adding 1 or by multiplying the difference of digit by 13 and adding 2. The number is

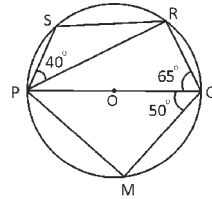
- (A) 14 (B) 41
(C) 51 (D) 13
(E) None of these

10. The value of x , y and z in the following similar figure



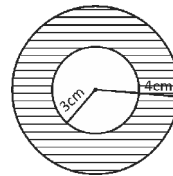
- (A) $\frac{5}{2}, 6, \frac{20}{9}$ (B) $8, \frac{5}{2}, \frac{20}{7}$
(C) $\frac{20}{3}, \frac{5}{2}, 8$ (D) $8, \frac{5}{2}, \frac{20}{3}$
(E) None of these

11. The measure of $\angle QPM$



- (A) 65° (B) 50°
(C) 40° (D) 72°
(E) None of these

12. The volume of shaded region is

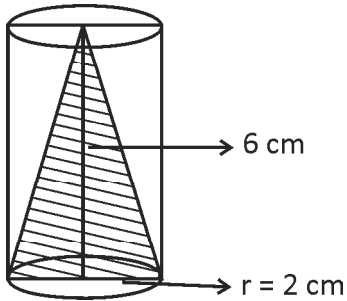


- (A) $\frac{148}{3} \pi \text{cm}^3$ (B) $\frac{152}{3} \pi \text{cm}^3$
(C) $\frac{187}{3} \pi \text{cm}^3$ (D) $\frac{190}{3} \pi \text{cm}^3$
(E) None of these

13. In a bag there are 3 black, 4 red and 5 green balls. A ball is drawn at random. The probability that it is green or red ball.

- (A) $\frac{3}{12}$ (B) $\frac{4}{12}$
(C) $\frac{5}{12}$ (D) $\frac{9}{12}$
(E) None of these

14. The volume of shaded region 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

15. If the length of a rectangle is 20% greater than the side of a square and breadth is 20% less than the side of the square. Which one of the following is correct as per above statement?

- (A) The area of the rectangle is greater than the area of the square
 (B) The area of the rectangle is equal to the area of the square
 (C) The perimeter of the rectangle is greater than the perimeter of square
 (D) The area of the rectangle is less than the area of the square
 (E) None of these



ANSWERS

1. (C) 2. (D) 3. (C) 4. (C) 5. (A) 6. (B) 7. (C) 8. (A)
 9. (B) 10. (D) 11. (C) 12. (A) 13. (D) 14. (A) 15. (A)