

APJEE

Sample Paper



MATHEMATICS

1. The rationalising factor of $\sqrt[7]{a^3b^4c^2}$ is

(A) $\sqrt{a^4b^3c^5}$ (B) $\sqrt[4]{a^4c^5b^3}$

(C) $\sqrt[7]{b^3c^5a^4}$ (D) $\sqrt[3]{c^5a^4b^3}$

2. The equivalent rational form of $17.\overline{6}$ is

(A) $\frac{88}{5}$ (B) $\frac{53}{3}$

(C) $\frac{444}{25}$ (D) $\frac{169}{9}$

3. The remainder when $a^4 - b^4$ is divided by $(a - b)$ is

(A) $a^3 - b^3$

(B) $a^2 + b^2$

(C) 0

(D) $(a^2 + b^2)(a + b)$

4. If $\left(3x + \frac{2}{x}\right) = 7$, then the value of

$\left(9x^2 - \frac{4}{x^2}\right)$ is

(A) 35

(B) 49

(C) 28

(D) 36

5. If $x^2 - 1$ is a factor of $ax^4 + bx^3 + cx^2 + dx + e$, then which of the following option is true?

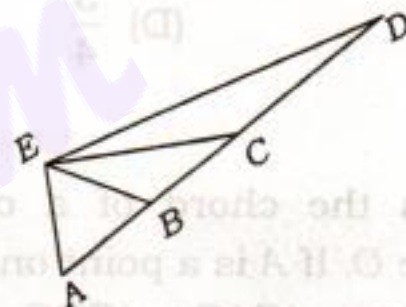
(A) $a + b + e = c + d$

(B) $a + b + c = d + e$

(C) $a + b + d = c + e$

(D) $a + c + e = b + d$

6. A, B, C and D are the points on a line. E is a point outside this line. Given that $AE = BE = AB = BC$ and $CE = CD$, then $m\angle DEA$ is



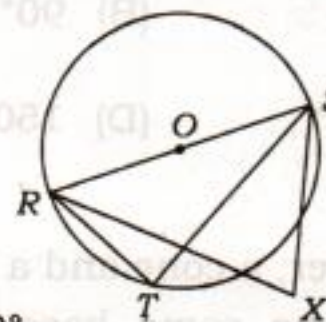
(A) 90°

(B) 105°

(C) 120°

(D) 150°

7. In the adjoining figure, RS is a diameter of circle. X is a point lying outside the circle. Then $\angle RXS$ is



(A) 90°

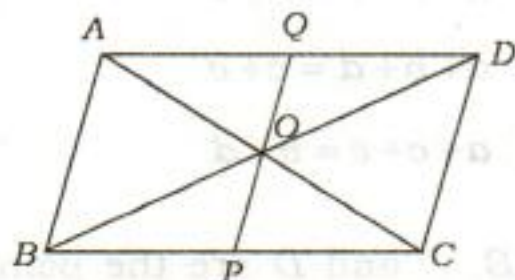
(B) greater than 90°

(C) less than 90°

(D) Cannot be determined from the given data

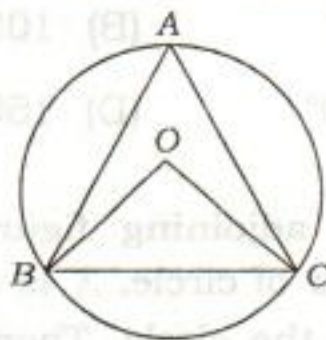
8. The diagonals AC and BD of a parallelogram $ABCD$ intersect each other at O . PQ is a line through O which meets BC at P and AD at Q .

If area (quadrilateral $ABPQ$) = $k \times$ area (quadrilateral $ABCD$) then k equals



- (A) $\frac{1}{3}$ (B) $\frac{1}{2}$
(C) $\frac{2}{3}$ (D) $\frac{3}{4}$

9. BC is the chord of a circle with centre O . If A is a point on major arc BC , then $\angle BAC + \angle OBC$ equals



- (A) 60° (B) 90°
(C) 120° (D) 150°

10. A cylinder, a cone and a hemisphere are of the same base and of the same height. The ratio of their volumes is

- (A) $1 : 2 : 3$ (B) $2 : 1 : 3$
(C) $3 : 1 : 2$ (D) $3 : 2 : 1$

11. A real number

$$\frac{2^2 \times 3^2 \times 7^2}{2^5 \times 5^3 \times 3^2 \times 7}$$

will have

- (A) repeating decimal
(B) non-terminating decimal
(C) terminating decimal
(D) non-terminating, non-repeating decimal

12. If $\sqrt{2}$ and $-\sqrt{2}$ are two zeroes of the polynomial $x^3 - 3x^2 - 2x + 6$, then its third zero is

- (A) $-2\sqrt{2}$ (B) $2\sqrt{2}$
(C) 3 (D) -3

13. If the equation

$$x^2 - 2x(1 + 3k) + 7(3 + 2k) = 0$$

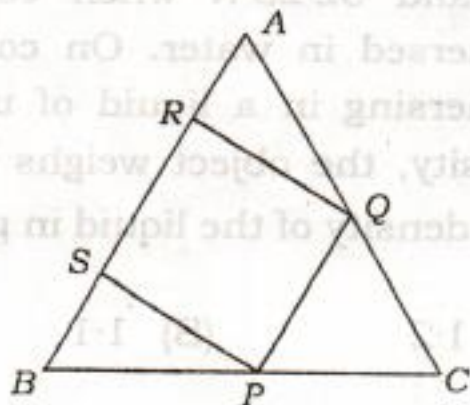
has equal roots, then k equals

- (A) 2 or $\frac{10}{9}$ (B) -2 or $\frac{10}{9}$
(C) 2 or $-\frac{10}{9}$ (D) -2 or $-\frac{10}{9}$

14. If the first, second and last terms of an AP are x , y and $2x$ respectively, then the sum of AP is

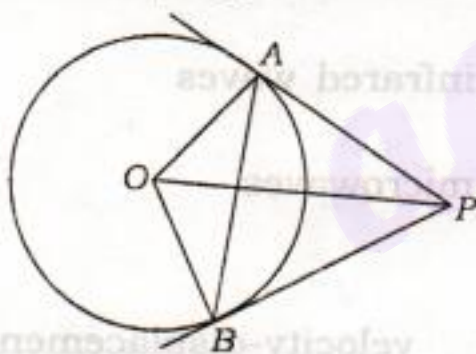
- (A) $\frac{xy}{2(y-x)}$ (B) $\frac{xy}{y-x}$
(C) $\frac{3xy}{2(y-x)}$ (D) $\frac{2xy}{y-x}$

15. In the adjoining figure, PQRS is a square and ABC is an equilateral triangle, then $\frac{AR}{SB}$ equals



- (A) $\frac{AQ}{BP}$ (B) $\frac{BP}{AQ}$
(C) $\frac{SB}{AR}$ (D) $\frac{AQ}{QC}$

16. In the given figure, O is the centre of a circle of radius 5 cm. The tangents at A and B meet at P. If $OP = 10$ cm, then $\angle OAB$ equals



- (A) 25° (B) 60°
(C) 35° (D) 30°

17. If

$\sin A + \cos A = p$ and $\sec A + \operatorname{cosec} A = q$
then $q(p^2 - 1)$ equals

- (A) 2 (B) $\frac{2}{p}$
(C) $\frac{2}{p^2}$ (D) $2p$

18. The angles of elevation of the top of a tower from two points at a distance of 4 m and 9 m from the base of the tower and in the same straight line with it are complementary. The height of the tower is

- (A) 13 m (B) 5 m

- (C) 36 m (D) 6 m

19. A wire bent in the form of a circle of radius 42 cm is cut and again bent in the form of a square. The ratio of the regions enclosed by the circle and the square in two cases (taking $\pi = \frac{22}{7}$) is

- (A) 11 : 12 (B) 14 : 11

- (C) 21 : 33 (D) 22 : 30

20. The probability for a randomly selected number from 30 to 50 to be a prime number in which both the digits are also prime is

- (A) $\frac{5}{21}$ (B) $\frac{1}{4}$

- (C) $\frac{1}{20}$ (D) $\frac{1}{21}$