

CONIC-SECTION

EE24BTECH11038 - MALAKALA BALA SUBRAHMANYA ARAVIND

1 SECTION B

- 1) A hyperbola passes through point $\mathbf{P}(\sqrt{2}, \sqrt{2})$ and has foci at $(\pm 2, 0)$. Then the tangent to this hyperbola at \mathbf{P} also passes through the point : (JEE M 2017)
 - a) $(-\sqrt{2}, -\sqrt{3})$
 - b) $(3\sqrt{2}, 2\sqrt{3})$
 - c) $(2\sqrt{2}, 3\sqrt{3})$
 - d) $(\sqrt{3}, \sqrt{2})$
- 2) The radius of a circle, having minimum area, which touches the curve $y = 4 - x^2$ and the lines, $y = |x|$ is : (JEE M 2018)
 - a) $4(\sqrt{2} + 1)$
 - b) $2(\sqrt{2} + 1)$
 - c) $2(\sqrt{2} - 1)$
 - d) $4(\sqrt{2} - 1)$
- 3) Tangents are drawn to the hyperbola $4x^2 - y^2 = 36$ at the points \mathbf{P} and \mathbf{Q} . If these tangents intersect at the point $\mathbf{T}(0, 3)$ then the area (in sq.units) of ΔPTQ is: (JEE M 2018)
 - a) $54\sqrt{3}$
 - b) $60\sqrt{3}$
 - c) $36\sqrt{3}$
 - d) $45\sqrt{5}$
- 4) Tangent and normal are drawn at $\mathbf{P}(16, 16)$ on the parabola $y^2 = 16x$, which intersect the axis of the parabola at \mathbf{A} and \mathbf{B} , respectively. If \mathbf{C} is the centre of the circle through the points \mathbf{P} , \mathbf{A} and \mathbf{B} and $\angle CPB = \theta$, then the value of $\tan \theta$ is : (JEE M 2018)
 - a) 2
 - b) 3
 - c) $\frac{4}{3}$
 - d) $\frac{1}{2}$
- 5) Two sets A and B are as under: $A = \{(a, b) \in \mathbb{R} \times \mathbb{R} : |a - 5| < 1 \text{ and } |b - 5| < 1\}$
 $B = \{(a, b) \in \mathbb{R} \times \mathbb{R} : 4(a - 6)^2 + 9(b - 5)^2 \leq 36\}$ (JEE M 2018)
 - a) $A \subset B$
 - b) $A \cap B$
 - c) neither $A \subset B$ nor $B \subset A$
 - d) $B \subset A$

- 6) If the tangent at $(1, 7)$ to the curve $x^2 = y - 6$ touches the circle $x^2 + y^2 + 16x + 12y + c = 0$ then the value of c is : (JEEM 2018)
- 185
 - 85
 - 95
 - 195
- 7) Axis of a parabola lies along X-axis. If its vertex and focus are at a distance 2 and 4 respectively from origin, on the positive X-axis then which of the following points does not lie on it? (JEE M 2018)
- $(5, 2\sqrt{6})$
 - $(8, 6)$
 - $(6, 4\sqrt{2})$
 - $(4, -4)$
- 8) Let $0 < \theta < \pi/2$. If the eccentricity of the hyperbola $\frac{x^2}{\cos^2 \theta} - \frac{y^2}{\sin^2 \theta} = 1$ is greater than 2, then the length of its latus rectum lies in the interval: (JEE M 2019-9 Jan(M))
- $(5, \infty)$
 - $(\frac{3}{2}, 3]$
 - $(2, 3]$
 - $(1, \frac{3}{2}]$
- 9) Equation of a common tangent to the circle $x^2 + y^2 - 6x = 0$ and the parabola $y^2 = 4x$, is: (JEE M 2019-9 Jan(M))
- $2\sqrt{3}y = 12x + 1$
 - $\sqrt{3}y = x + 3$
 - $2\sqrt{3}y = -x - 12$
 - $\sqrt{3}y = 3x + 1$
- 10) If the line $y = mx + 7\sqrt{3}$ is normal to the hyperbola $\frac{x^2}{24} - \frac{y^2}{18} = 1$ then a value of m is: (JEEM 2019-9 April(M))
- $\frac{\sqrt{5}}{2}$
 - $\frac{\sqrt{15}}{2}$
 - $\frac{2}{\sqrt{5}}$
 - $\frac{3}{\sqrt{5}}$
- 11) If one end of a focal chord of the parabola, $y^2 = 16x$ is at $(1, 4)$, then the length of this focal chord is : (JEE M 2019-9 Jan(M))
- 25
 - 22
 - 24
 - 20

FUNCTIONS

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2 SECTION B

- 19) If the fractional part of the number $\frac{2^{403}}{15}$ is $\frac{k}{15}$, then k is equal to: (JEE M 2019-9 Jan(M))
- a) 6
 - b) 8
 - c) 4
 - d) 14
- 20) If the function $f: \mathbb{R} - \{-1, 1\} \rightarrow A$ is defined by $f(x) = \frac{x^2}{1-x^2}$, is surjective then A is equal to: (JEE M 2019-9 Jan(M))
- a) $\mathbb{R} - \{1\}$
 - b) $(0, \infty)$
 - c) $\mathbb{R} - [-1, 0)$
 - d) $(-1, 0)$
- 21) let $\sum_{k=1}^{10} f(a+k) = 16(2^{10} - 1)$, where the function f satisfies $f(x+y) = f(x)f(y)$ for all natural numbers x,y and $f(a) = 2$.then the natural number ‘a’ is: (JEE M 2019-9 April(M))
- a) 2
 - b) 16
 - c) 4
 - d) 3