

CONIC SECTION

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Section-A JEE Advanced/IIT-JEE

A. Fill in the blanks

- 1) The point of intersection of the tangents at the ends of the latus rectum of the parabola $y^2 = 4x$ is (1994 – 2 – Marks)
- 2) An ellipse has eccentricity $\frac{1}{2}$ and one focus at the point $P(\frac{1}{2}, 1)$. Its one directrix is common tangent, nearer to the point P , to the circle $x^2 + y^2 = 1$ and the hyperbola $x^2 - y^2 = 1$. The equation of the ellipse, in the standard form, is.... (1992 – 2 Marks)

C. MCQS with One Correct Answer

- 1) The equation $\frac{x^2}{1-r} - \frac{y^2}{1+r} = 1, r > 1$ represents: (1981 – 2 Marks)

- a) an ellipse
- b) a hyperbola
- c) a circle
- d) none of there

- 2) Each of the four inequalities give below defines a region in xy plane. One of these four regions does not have the following property. For any two points $(\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2})$ is also in region. The inequality defining this region is: (1981 – 2 Marks)

- a) $x^2 + 2y^2 \leq 1$
- b) $\max |x|, |y| \leq 1$
- c) $x^2 - y^2 \leq 1$
- d) $y^2 - x \leq 0$

- 3) The equation $2x^2 + 3y^2 - 8x - 18y + 35 = k$ represents: (1994)

- a) no locus if $k < 0$
- b) an ellipse if $k < 0$
- c) a point if $k = 0$
- d) a hyperbola if $k > 0$

- 4) Let E be the ellipse $\frac{x^2}{9} + \frac{y^2}{4} = 1$ and C be the circle $x^2 + y^2 = 9$. Let P and Q be the points $(1, 2)$ and $(2, 1)$ respectively. Then: (1994)

- a) Q lies inside C but outside E
- b) Q lies outside both C and E
- c) P lies inside both C and E
- d) P lies inside C but outside E

- 5) Consider a circle with its centre lying on focus of the parabola $y^2 = 2px$ such that it touches the directrix of the parabola. Then a point of intersection of the circle and the parabola is (1995S)

- a) $(\frac{p}{2}, p)$ or $(\frac{p}{2}, -p)$
- b) $(\frac{p}{2}, -\frac{p}{2})$
- c) $(-\frac{p}{2}, p)$
- d) $(-\frac{p}{2}, -\frac{p}{2})$

- 6) The radius of the circle passing through the foci of the ellipse $\frac{x^2}{16} + \frac{y^2}{9} = 1$. and having its centre at $(0, 3)$ is: (1995S)

- a) 4
- b) 3
- c) $\sqrt{\frac{1}{2}}$
- d) $\frac{7}{2}$

- 7) Let $P(a \sec \theta, b \tan \theta)$ and $Q(a \sec \phi, b \tan \phi)$, where $\theta + \phi = \pi/2$, be two points on the hyperbola $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$. If (h, k) is the point of intersection of the normals at P and Q , then K equal to (1999 – 2 Marks)

- a) $\frac{a^2+b^2}{a}$
- b) $-\left(\frac{a^2+b^2}{a}\right)$
- c) $\frac{a^2+b^2}{b}$
- d) $-\left(\frac{a^2+b^2}{b}\right)$

- 8) If $x = 9$ is the chord of contact of the hyperbola $x^2 - y^2 = 9$, then the equation of the corresponding pair of tangents is: (1999 – 2Marks)
- $9x^2 - 8y^2 + 18x - 9 = 0$
 - $9x^2 - 8y^2 - 18x + 9 = 0$
 - $9x^2 - 8y^2 - 18x - 9 = 0$
 - $9x^2 - 8y^2 + 18x + 9 = 0$
- 9) The curve described parametrically by $x = t^2 + t + 1, y = t^2 - t + 1$ represents (1999 – 2Marks)
- a pair of straight lines
 - an ellipse
 - a parabola
 - a hyperbola
- 10) If $x + y = k$ is normal to $y^2 = 12x$, then K is (2000s)
- 3
 - 9
 - 9
 - 3
- 11) If the line $x - 1 = 0$ is the directrix of parabola $y^2 - kx + 8 = 0$, then one of the values of K is (2000S)
- $\frac{1}{8}$
 - 8
 - 4
 - $\frac{1}{4}$
- 12) The equation of the common tangent touching the circle $(x - 3)^2 - kx + 8 = 0$ and the parabola $y^2 = 4x$ above the x -axis is (2000s)
- $\sqrt{3}y = 3x + 1$
 - $\sqrt{3}y = -(x + 3)$
 - $\sqrt{3}y = x + 3$
 - $\sqrt{3}y = -(3x + 1)$
- 13) The equation of the directrix of the parabola $y^2 + 4y + 4x + 2 = 0$ is (2001S)
- $x = -1$
 - $x = 1$
 - $x = -\frac{3}{2}$
 - $x = \frac{3}{2}$