Theorem[section] Problem Proposition[section] Lemma[section] [theorem]Corollary Example[section] [problem]Definition Remark

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 $p\left(\frac{1}{2}, 1\right)$.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.... $(1992 - 2Marks)$

C. MCQS with One Correct Answer

1) The equation $\frac{x^2}{1-r} - \frac{y^2}{1+r} = 1, r > 1$ represents: $(1981 - 2Marks)$
   a) an ellipse
   b) b) a hyperbola
   c) a circle
   d) 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 $\left(\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2}\right)$ is also in region.The inequality defining this region is: $(1981 - 2Marks)$
   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) $\left(\frac{p}{2}, p\right)$ or $\left(\frac{p}{2}, -p\right)$
   b) $\left(\frac{p}{2}, -\frac{p}{2}\right)$
   c) $\left(-\frac{p}{2}, p\right)$
   d) $\left(-\frac{p}{2}, -\frac{p}{2}\right)$

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 0f intersection of the normals at P and Q, then K equal to $(1999 - 2Marks)$
   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: $(1999 - 2Marks)$

   a) $9x^2 - 8y^2 + 18x - 9 = 0$
   b) $9x^2 - 8y^2 - 18x + 9 = 0$
   c) $9x^2 - 8y^2 - 18x - 9 = 0$
   d) $9x^2 - 8y^2 + 18x + 9 = 0$

9) The curve described parametrically by $x = t^2 + t + 1, y = t^2 - t + 1$ represents $(1999 - 2Marks)$
   a) a pair of straight lines
   b) an ellipse
   c) a parabola
   d) a hyperbola

10) If $x+y = k$ is normal $y^2 = 12x$,then K is$(2000s)$
   a) 3
   b) 9
   c) -9
   d) -3

11) If the line $x - 1 = 0$ is the directrix of parabola $y^2 - kx + 8 = 0$,than one of the values of K is $(2000S)$
   a) $1/8$
   b) 8
   c) 4
   d) $1/4$

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 $(2000s)$
   a) $\sqrt{3}y = 3x + 1$
   b) $\sqrt{3}y = -(x + 3)$
   c) $\sqrt{3}y = x + 3$
   d) $\sqrt{3}y = -(3x + 1)$

13) The equation of the directrix of the parabola $y^2 + 4y + 4x + 2 = 0$ is $(2001S)$
   a) $x = -1$
   b) $x = 1$
   c) $x = -3/2$
   d) $x = 3/2$