DPP
DAILY PRACTICE PROBLEMS

CLASS : XIth
DATE :

Solutions

SUBJECT : MATHS
DPP NO. : 3

Topic :- CONIC SECTION

1. A rectangular hyperbola whose centre is C is cut by any circle of radius r in four points P,Q,R and S. Then, $CP^2 + CQ^2 + CR^2 + CS^2 =$

a) r^2 b) $2r^2$ c) $3r^2$ d) $4r^2$

2. If PQ is a double ordinate of the hyperbola $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$ such that OPQ is an equilateral triangle, O being the centre of the hyperbola. Then, the eccentricity e of the hyperbola satisfies

a) $1 < e < \frac{2}{\sqrt{3}}$ b) $e = \frac{2}{\sqrt{3}}$ c) $e = \frac{\sqrt{3}}{2}$ d) $e > \frac{2}{\sqrt{3}}$

3. If e and e_1, are the eccentricities of the hyperbolas $xy = c^2$ and $x^2 - y^2 = c^2$, then $e^2 + e_1^2$ is equal to

a) 1 b) 4 c) 6 d) 5

4. If e and e_1 are the eccentricities of hyperbolas $xy = c^2$ and $x^2 - y^2 = c^2$, then $e^2 + e_1^2$ is

a) 1 b) 4 c) 6 d) 8

5. The eccentricity of the hyperbola in the standard form $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$, passing through (3, 0) and ($3,\sqrt{2}$, 2) is

a) $\frac{13}{3}$ b) $\sqrt{13}$ c) $\sqrt{3}$ d) $\frac{\sqrt{13}}{3}$

6. Which of the following is a point on the common chord of the circles $x^2 + y^2 + 2x - 3y + 6 = 0$ and$x^2 + y^2 + x - 8y - 13 = 0$?

a) $(1, -2)$ b) $(1, 4)$ c) $(1, 2)$ d) $(1, -4)$

7. If the chord of contact of tangents drawn from a point P to the ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ subtends a right-angle at its centre, then P lies on

a) $\frac{x^2}{a^2} + \frac{y^2}{b^2} = \frac{1}{a^2} + \frac{1}{b^2}$ b) $\frac{x^2}{a^4} + \frac{y^2}{b^4} = \left(\frac{1}{a} + \frac{1}{b}\right)^2$ c) $\frac{x^2}{a^2} + \frac{y^2}{b^2} = \frac{1}{a^4} + \frac{1}{b^4}$ d) $\frac{x^2}{a^4} + \frac{y^2}{b^4} = \frac{1}{a^2} + \frac{1}{b^2}$

8. The locus of a point which moves such that the difference of its distances from two fixed points is always a constant, is

a) a circle b) a straight line c) a hyperbola d) an ellipse

9. Eccentricity of the ellipse $x^2 + 2y^2 - 2x + 3y + 2 = 0$ is

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

10. If e is the eccentricity of $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$ and θ be the angle between the asymptotes, then $\sec\frac{\theta}{2}$ equals

a) e^2 b) $\frac{1}{e}$ c) $2e$ d) e

11. If $P(-3,2)$ is one end of the focal chord PQ of the parabola $y^2 + 4x + 4y = 0$, then the slope of the normal at Q is

a) $-1/2$ b) 2 c) $1/2$ d) -2

12. The equation of the circumcircle of the triangle formed by the lines $y + \sqrt{3}\,x = 6, y - \sqrt{3}\,x = 6$ and $y = 0$ is

a) $x^2 + y^2 - 4\,y = 0$
b) $x^2 + y^2 + 4\,x = 0$
c) $x^2 + y^2 - 4\,y - 12 = 0$
d) $x^2 + y^2 + 4\,x = 12$

13. The centre of the circle $r^2 - 4r(\cos\theta + \sin\theta) - 4 = 0$ in Cartesian coordinates is

a) $(1, 1)$ b) $(-1, -1)$ c) $(2, 2)$ d) $(-2, -2)$

14. The locus of the middle of chords of length 4 of the circle $x^2 + y^2 = 16$ is

a) A straight line b) A circle of radius 2 c) A circle of radius $2\sqrt{3}$ d) An ellipse

15. The normal at P to a hyperbola of eccentricity e, intersects its transverse and conjugate axes at L and M respectively. If locus of the mid point of LM is hyperbola, then eccentricity of the hyperbola is

a) $\left(\frac{e+1}{e-1}\right)$ b) $\frac{e}{\sqrt{(e^2-1)}}$ c) e d) None of these

16. If the chords of the rectangular hyperbola $x^2 - y^2 = a^2$ touch the parabola $y^2 = 4ax$, then the locus of their mid-points is

a) $x^2(y - a) = y^3$ b) $y^2(x - a) = x^3$ c) $x(y^2 - a) = y$ d) $y(x^2 - a) = x$

17. If the tangent at point P on the circle $x^2 + y^2 + 6x + 6y - 2 = 0$ meets the straight line $5x - 2y + 6 = 0$ at a point Q on the y-axis, then length PQ

a) 4 b) $2\sqrt{5}$ c) 5 d) $3\sqrt{5}$

18. An ellipse is described by using an endless string which is passed over two pins. If the axes are 6 cm and 4 cm, the necessary length of the string and the distance between the pins respectively in cms. are

a) $6, 2\sqrt{5}$ b) $6, \sqrt{5}$ c) $4, 2\sqrt{5}$ d) None of these

19. The slope of tangents drawn form a point $(4, 10)$ to the parabola $y^2 = 9x$ are

a) $\frac{1}{4}, \frac{3}{4}$ b) $\frac{1}{4}, \frac{9}{4}$ c) $\frac{1}{4}, \frac{1}{3}$ d) None of these

20. The area of the triangle formed by the tangents from the point $(4,3)$ to the circle $x^2 + y^2 = 9$ and the line joining their points of contact, is

a) $\frac{25}{192}$ sq. units b) $\frac{192}{25}$ sq.units c) $\frac{384}{25}$ sq.units d) None of these