DPP
DAILY PRACTICE PROBLEMS

CLASS : XIth
DATE :

Solutions

SUBJECT : MATHS
DPP NO. : 4

Topic :- CONIC SECTION

1. The value of m, for which the line $y = mx + 2$ becomes a tangent to the conic $4x^2 - 9y^2 = 36$ are

a) $\pm\frac{2}{3}$ b) $\pm\frac{2\sqrt{2}}{3}$ c) $\pm\frac{8}{9}$ d) $\pm\frac{4\sqrt{2}}{3}$

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

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

3. Consider a family of circles, which are passing through the point $(-1, 1)$ and are tangent to x-axis. If (h, k) are the coordinates of the centre of the circles, then the set of values of k is given by the interval

a) $0 < k < \frac{1}{2}$ b) $k \geq \frac{1}{2}$ c) $-\frac{1}{2} \leq k \leq \frac{1}{2}$ d) $k \leq \frac{1}{2}$

4. The equation of the circle passing through the point $(1, 1)$ and through the points of intersection of the circles $x^2 + y^2 = 6$ amnd $x^2 + y^2 - 6y + 8 = 0$ is

a) $x^2 + y^2 + 3y - 13 = 0$ b) $x^2 + y^2 - 3y + 1 = 0$
c) $x^2 + y^2 - 3x + 1 = 0$ d) $5x^2 + 5y^2 + 6y + 16 = 0$

5. The number of distinct normal that can be drawn from $(11/4, 1/4)$ to the parabola $y^2 = 4x$, is

a) 3 b) 2 c) 1 d) 4

6. For the hyperbola $\frac{x^2}{\cos^2\alpha} - \frac{y^2}{\sin^2\alpha} = 1$, which of the following remains constant when α varies?

a) Eccentricity b) Directrix c) Abscissae of vertices d) Abscissae of foci

7. The equation of the circumcircle of the triangle formed by the lines $x = 0$, $y = 0$, $2x + 3y = 5$, is

a) $6(x^2 + y^2) + 5(3x - 2y) = 0$
b) $x^2 + y^2 - 2x - 3y + 5 = 0$
c) $x^2 + y^2 + 2x - 3y - 5 = 0$
d) $6(x^2 + y^2) - 5(3x + 2y) = 0$

8. If t_1 and t_2 be the parameters of the end points of a focal chord for the parabola $y^2 = 4ax$, then which one is true?

a) $t_1 t_2 = 1$ b) $\frac{t_1}{t_2} = 1$ c) $t_1 t_2 = -1$ d) $t_1 + t_2 = -1$

9. The two circles
$x^2 + y^2 - 2x + 22y + 5 = 0$ and
$x^2 + y^2 + 14x + 6y + k = 0$ intersect orthogonally provided k is equal to

a) 47 b) -47 c) 49 d) -49

10. The ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ and the straight line $y = mx + c$ intersect in real points only if

a) $a^2m^2 < c^2 - b^2$ b) $a^2m^2 > c^2 - b^2$ c) $a^2m^2 \geq c^2 - b^2$ d) $c \geq b$

11. If four points to be taken on a rectangular hyperbola such that the chord joining any two is perpendicular to the chord joining the other two and if $\alpha, \beta, \gamma, \delta$ be the inclination to either asymptote of the straight line joining these points to the centre. Then, $\tan\alpha \tan\beta \tan\gamma \tan\delta$ is equal to

a) 1 b) 0 c) 2 d) 3

12. If the distance between the foci and the distance between the directrices of the hyperbola $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$ are in the ratio 3 :2, then a : b is

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

13. If m_1 and m_2 are the slopes of tangents to the circle $x^2 + y^2 = 4$ from the point (3, 2), then $m_1 - m_2$ is equal to

a) $\frac{5}{12}$ b) $\frac{12}{5}$ c) $\frac{3}{2}$ d) 0

14. The length of the axes of the conic $9x^2 + 4y^2 - 6x + 4y + 1 = 0$, are

a) $\frac{1}{2}$,9 b) 3, $\frac{2}{5}$ c) 1, $\frac{2}{3}$ d) 3,2

15. For different values of α, the locus of the point of intersection of the two straight lines $\sqrt{3}x - y - 4\sqrt{3}\alpha = 0$ and $\sqrt{3}\alpha x + \alpha y - 4\sqrt{3} = 0$ is

a) a hyperbola with eccentricity 2
b) an ellipse with eccentricity $\sqrt{\frac{2}{3}}$
c) an hyperbola with eccentricity $\sqrt{\frac{19}{16}}$
d) an ellipse with eccentricity $\frac{3}{4}$

16. If the area of the circle $4x^2 + 4y^2 - 8x + 16y + k = 0$ is 9π sq unit, then the4 value of k is

a) 4 b) 16 c) -16 d) ± 16

17. $ABCD$ is a square whose side is a. The equation of the circle circumscribing the square, taking AB and AD as axes of reference, is

a) $x^2 + y^2 + ax + ay = 0$

b) $x^2 + y^2 + ax - ay = 0$

c) $x^2 + y^2 - ax - ay = 0$

d) $x^2 + y^2 - ax + ay = 0$

18. If the circle $x^2 + y^2 + 2gx + 2fy + c = 0$ bisects the circumference of the circle $x^2 + y^2 + 2g' x + 2f'y + c' = 0$, then

a) $2\, g(g - g') + 2\, f(f - f') = c - c'$

b) $2\, g'(g - g') + 2\, f'(f - f') = c' - c$

c) $2\, g'(g - g') + 2\, f'(f - f') = c - c'$

d) $2\, g(g - g') + 2\, f(f - f') = c' - c$

19. If the parabolas $y^2 = 4x$ and $x^2 = 32y$ intersect at $(16,8)$ at an angle θ, then θ is equal to

a) $\tan^{-1}(3/5)$ b) $\tan^{-1}(4/5)$ c) π d) $\pi/2$

20. The equation of the circle, which cuts orthogonally each of three circles
$x^2 + y^2 - 2x + 3y - 7 = 0$,
$x^2 + y^2 + 5x - 5y + 9 = 0$
and $x^2 + y^2 + 7x - 9y + 29 = 0$

a) $x^2 + y^2 - 16x - 18y - 4 = 0$ b) $x^2 + y^2 = a^2$

c) $x^2 + y^2 - 16x = 0$ d) $y^2 - x^2 + 2x = 0$