DPP
DAILY PRACTICE PROBLEMS

CLASS : XIth
DATE :

Solutions

SUBJECT : MATHS
DPP NO. : 2

Topic :- CONIC SECTION

1. The equation $ax^2 + 2hxy + by^2 + 2gx + 2fy + c = 0$ represents a rectangular hyperbola if
   a) $\Delta \neq 0, h^2 > ab, a + b = 0$
   b) $\Delta \neq 0, h^2 < ab, a + b = 0$
   c) $\Delta \neq 0, h^2 = ab, a + b = 0$
   d) None of these

2. The line passing through the extremity A of the major axis and extremity B of the minor axis of the ellipse $x^2 + 9y^2 = 9$ meets its auxiliary circle at the point M. Then, the area of the triangle with vertices at A, M and the origin O is
   a) $\frac{31}{10}$ b) $\frac{29}{10}$ c) $\frac{21}{10}$ d) $\frac{27}{10}$

3. From the point $(-1, -6)$ two tangents are drawn to the parabola $y^2 = 4x$. Then, the angle between the two tangents is
   a) $30°$ b) $45°$ c) $60°$ d) $90°$

4. The centre of the ellipse $4x^2 + 9y^2 + 16x - 18y - 11 = 0$ is
   a) $(-2, -1)$ b) $(-2, 1)$ c) $(2, -1)$ d) None of these

5. The circle whose equation are $x^2 + y^2 + c^2 = 2ax$ and $x^2 + y^2 + c^2 - 2by = 0$ will touch one another externally if
   a) $\frac{1}{b^2} + \frac{1}{c^2} = \frac{1}{a^2}$ b) $\frac{1}{c^2} + \frac{1}{a^2} = \frac{1}{b^2}$ c) $\frac{1}{a^2} + \frac{1}{b^2} = \frac{1}{c^2}$ d) None of these

6. In an ellipse the distance between the foci is 8 and the distance between the directrices is 25. The length of major axis is
   a) $10\sqrt{2}$ b) $20\sqrt{2}$ c) $30\sqrt{2}$ d) None of these

7. If $lx + my + n = 0$ represents a chord of the ellipse $b^2x^2 + a^2y^2 = a^2b^2$ whose eccentric angles differ by $90°$, then
   a) $a^2l^2 + b^2m^2 = n^2$
   b) $\frac{a^2}{l^2} + \frac{b^2}{m^2} = \frac{(a^2 - b^2)^2}{n^2}$
   c) $a^2l^2 + b^2m^2 = 2n^2$
   d) None of these

8. If the latusrectum of a hyperbola forms an equilateral triangle with the vertex at the centre of the hyperbola, then the eccentricity of the hyperbola is
   a) $\frac{\sqrt{5} + 1}{2}$ b) $\frac{\sqrt{11} + 1}{2}$ c) $\frac{\sqrt{13} + 1}{2\sqrt{3}}$ d) $\frac{\sqrt{13} - 1}{2\sqrt{3}}$

9. The eccentricity of the conic $4x^2 + 16y^2 - 24x - 32y = 1$ is

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

10. If the chords of contact of tangents from two points (x_1, y_1) and (x_2, y_2) to the hyperbola $4x^2 - 9y^2 - 36 = 0$ are at right angles, then $\frac{x_1 x_2}{y_1 y_2}$ is equal to

a) $\frac{9}{4}$ b) $-\frac{9}{4}$ c) $\frac{81}{16}$ d) $-\frac{81}{16}$

11. The equation of a circle which cuts the three circles

$x^2 + y^2 - 2x - 6y + 14 = 0$

$x^2 + y^2 - x - 4y + 8 = 0$

$x^2 + y^2 + 2x - 6y + 9 = 0$

orthogonally, is

a) $x^2 + y^2 - 2x - 4y + 1 = 0$

b) $x^2 + y^2 + 2x + 4y + 1 = 0$

c) $x^2 + y^2 - 2x + 4y + 1 = 0$

d) $x^2 + y^2 - 2x - 4y - 1 = 0$

12. The length of the common chord of the ellipse $\frac{(x-1)^2}{9} + \frac{(y-2)^2}{4} = 1$ and the circle $(x-1)^2 + (y-2)^2 = 1$ is

a) 2 b) $\sqrt{3}$ c) 4 d) None of these

13. The mirror image of the directrix of the parabola $y^2 = 4(x+1)$ in the line mirror $x + 2y = 3$, is

a) $x = -2$ b) $4y - 3x = 16$ c) $x - 3y = 0$ d) $x + y = 0$

14. The line $x = at^2$ meets the ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ in the real points, if

a) $|t| < 2$ b) $|t| \leq 1$ c) $|t| > 1$ d) None of these

15. The length of the latusrectum of the hyperbola $\frac{x^2}{a^2} - \frac{y^2}{b^2} = -1$, is

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

16. The condition that the chord $x\cos\alpha = 0 + y\sin\alpha - p = 0$ of $x^2 + y^2 - a^2 = 0$ may subtend a right angle at the centre of the circle is

a) $a^2 = 2p^2$ b) $p^2 = 2a^2$ c) $a = 2p$ d) $p = 2a$

17. Given that circle $x^2 + y^2 - 2x + 6y + 6 = 0$ and $x^2 + y^2 - 5x + 6y + 15 = 0$ touch, the equation to their common tangent is

a) $x = 3$ b) $y = 6$ c) $7x - 12y - 21 = 0$ d) $7x + 12y + 21 = 0$

18. The number of common tangents of the circles $x^2 + y^2 - 2x - 1 = 0$ and $x^2 + y^2 - 2y - 7 = 0$ is

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

19. A ray of light incident at the point $(-2, -1)$ gets reflected from the tangent at $(0, -1)$ to the circle $x^2 + y^2 = 1$. The reflected ray touches the circle. The equation of the line along which the incident ray moved is

a) $4x - 3y + 11 = 0$ b) $4x + 3y + 11 = 0$ c) $3x + 4y + 11 = 0$ d) None of these

20. If the points $A(2,5)$ and B are symmetrical about the tangent to the circle $x^2 + y^2 - 4x + 4y = 0$ at the origin, then the coordinates of B are

a) $(5, -2)$ b) $(1,5)$ c) $(5,2)$ d) None of these