



Answer The following questions:

Q1: Choose the correct answer: [1.5 Marks for a point]

- If the value of eccentricity $e = 0$, then what is the name of the conic?
A. ellipse B. parabola C. hyperbola D. none
- If the distance from a point to the focus is 3 units and the distance from the directrix is 3 units, then the conic section called.....
A. ellipse B. parabola C. circle D. hyperbola
- The equation of the line whose intercepts on the x and y axes are respectively 5 and -3 is
A. $3x + 5y + 15$ B. $3x + 5y - 15$ C. $3x - 5y + 15$ D. $3x - 5y - 15$
- The midpoint of two points (7,1) and (-1,5)
A. (3,3) B. (4,-2) C. (-4,2) D. None
- Slope of the segment between two points (7,1) and (-1,5)
A. -2 B. -2/3 C. -3/2 D. -1/2
- If $p = 5, \omega = \pi/6$, then equation of normal form of straight line
A. $x + \sqrt{3}y - 10 = 0$ B. $\sqrt{3}x + y + 10 = 0$ C. $\sqrt{3}x + y - 10 = 0$ D. $x + \sqrt{3}y + 10 = 0$
- The distance from the line $8x + 15y - 24 = 0$ to point $(-2, -3)$
A. 4 B. 5 C. 8 D. 1/5
- If $Ax^2 + Bxy + Cy^2 = 0$ represents equation of two straight lines, then the angle between two lines
A. $\pm \frac{2\sqrt{B^2 - AC}}{A+C}$ B. $\pm \frac{2\sqrt{A^2 - AB}}{B+C}$ C. $\pm \frac{\sqrt{B^2 - AC}}{A+C}$ D. $\pm \frac{\sqrt{A^2 - AB}}{B+C}$
- Equation $x^2 + 2hxy + by^2 + 2gx + 2fy + c = 0$, represents two straight lines if
A. $\begin{vmatrix} a & b & c \\ b & h & f \\ c & f & g \end{vmatrix} = 0$ B. $\begin{vmatrix} a & g & h \\ g & b & f \\ h & f & c \end{vmatrix} = 0$ C. $\begin{vmatrix} a & f & g \\ f & b & h \\ g & h & c \end{vmatrix} = 0$ D. $\begin{vmatrix} a & h & g \\ h & b & f \\ g & f & c \end{vmatrix} = 0$
- The formulas for the rotation of the axes through an angle θ are
A. $x = x' \cos \theta - y' \sin \theta$ B. $x = x' \cos \theta + y' \sin \theta$ C. $x = x' \cos \theta + y' \sin \theta$ D. $x = x' \cos \theta - y' \sin \theta$
 $y = x' \sin \theta + y' \cos \theta$ $y = x' \sin \theta + y' \cos \theta$ $y = x' \sin \theta - y' \cos \theta$ $y = x' \sin \theta - y' \cos \theta$
- The center of circle $2x^2 + 2y^2 - Ax - By + C = 0$ is
A. (-A,-B) B. (A,B) C. (A/4,B/4) D. (A/2, B/2)
- The radius in the previous circle is
A. $r = \sqrt{\frac{A^2}{4} + \frac{B^2}{4} - C}$ B. $r = \sqrt{\frac{A^2}{2} - \frac{B^2}{2} + C}$ C. $r = \sqrt{\frac{A^2}{16} + \frac{B^2}{16} - C}$ D. $r = \sqrt{A^2 + B^2 - C}$
- The vertices in conic section $9x^2 - 16y^2 = 144$ are

A. $(0, \pm 4)$

B. $(\pm 3, 0)$

C. $(\pm 4, 0)$

D. $(0, \pm 3)$

14. In the previous conic section

A. $e = \frac{5}{4}$

B. $e = \frac{4}{5}$

C. $e = \frac{3}{4}$

D. $e = \frac{4}{3}$

15. Then, two foci are

A. $(\pm 5, 0)$

B. $(0, \pm 5)$

C. $(\pm 16/5, 0)$

D. $(0, \pm 16/3)$

16. And two directrices equations are:

A. $x = \pm \frac{16}{5}$

B. $x = \pm \frac{5}{16}$

C. $y = \pm 5$

D. $y = \pm \frac{16}{5}$

17. And equation of two Asymptotes equations are.....

A. $x = \pm \frac{3}{4}$

B. $y = \pm \frac{3}{4} x$

C. $y = \pm \frac{4}{3} x$

D. $y = \pm \frac{3}{4}$

18. The parabola $(x + 3)^2 = -16(y - 5)$

A. Symmetrical about x -axis and opens to left

B. Symmetrical about y - axis and opens downward

C. Symmetrical about x - axis and opens to right

D. Symmetrical about y - axis and opens upward

19. The equation of a parabola having the origin as its vertex and focus $(-4/3, 0)$ is:

A. $x^2 = -\frac{4}{3}y$

B. $y^2 = -\frac{16}{3}x$

C. $y^2 = +\frac{16}{3}x$

D. $x^2 = +\frac{4}{3}y$

20. The equation $4x^2 + 9y^2 - 48x + 72y + 144 = 0$ represents a....

A. circle

B. parabola

C. hyperbola

D. ellipse

21. The center of the previous question is

A. $(-36, -16)$

B. $(-6, 4)$

C. $(36, 16)$

D. $(6, -4)$

22. An ellipse having foci at $(0, 1)$ and $(4, 1)$, then the center is

A. $(0, 0)$

B. $(2, 1/2)$

C. $(2, 1)$

D. $(4, 0)$

23. If the eccentricity $e = 0$, then the conic section is.....

A. ellipse

B. parabola

C. hyperbola

D. none

24. Equation of circle with diameter points $A = (5, -1), B = (-3, 7)$

A. $(x + 1)^2 +$

B. $(x - 1)^2 +$

C. $(x + 1)^2 +$

D. $(x - 1)^2 +$

$(y + 3)^2 = 25$

$(y - 3)^2 = 25$

$(y + 3)^2 = 32$

$(y - 3)^2 = 32$

Q2 [14 marks]: Prove that the equation of parabola whose vertex is at the origin symmetrical about x axis is $y^2 = 4ax$ and the focal width = $|4a|$.

Q3 [10 marks]: Find the length of tangent of circle $x^2 + y^2 + 2fx + 2gy + c = 0$ drawn from a point (x_1, y_1) .

Q4 [10 marks]: Determine the equation of the curve $2x^2 + 3y^2 - 8x + 6y = 7$ when the origin is translated to the point $(2, -1)$. (explain the new curve).

With best wishes

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