GOVERNMENT OF KARNATAKA
DEPARTMENT OF SCHOOL EDUCATION (PRE-UNIVERSITY)
18TH CROSS, MALLESHWARAM, BENGALURU – 560 012

CHAPTERWISE MULTIPLE CHOICE QUESTIONS FOR COMPETATIVE EXAM

SUBJECT: MATHEMATICS – I PUC

NAME OF THE CHAPTER: CONIC SECTIONS

RECAP

A conic section is the locus of a point which moves such that the ratio of its distance from a fixed point to its distance from a fixed line (not containing the point) is a constant.

The fixed point is known as the focus and is normally denoted with the letter S.

The fixed line is known as the directrix.

The constant ratio is known as the eccentricity of the conic section and is denoted by the letter e.

(a) When e < 1, the conic section is called an ellipse

(b) When e = 1, the conic section is called a parabola

(c) When e > 1, the conic section is called a hyperbola

Axis: The straight line passing through the focus and perpendicular to the directrix is called the axis of the conic section.

Chord: A line segment joining two points on the conic section is called a chord.

Focal chord: A chord that passes through the focus is called a focal chord.

Double ordinate: A chord that is perpendicular to the axis of the conic section is called a double ordinate.

Latus rectum: The focal chord that is also a double ordinate is called a latus rectum.

The General Second-Degree Equation

The equation $ax^2 + 2hxy + by^2 + 2gx + 2fy + c = 0$ represents a conic section if and only if $\Delta = abc + 2fgh - af^2 - bg^2 - ch^2 \neq 0$.

If $h^2 < ab$, it is an ellipse

If $h^2 = ab,$ i.e., 2nd degree terms form a perfect square, it is a parabola.

If $h^2 > ab,$ it is a hyperbola.

Circles:

A circle is the locus of a point, which moves such that its distance from a fixed point, called the centre, is equal to a given distance, called the radius. Equations of circle:

- ✓ Centre at origin, radius a: $x^2 + y^2 = a^2$
- ✓ Centre at (h, k), radius a: $(x - h)^2 + (y - k)^2 = a^2$
- ✓ Diameter form: $(x - x_1)(x - x_2) + (y - y_1)(y - y_2) = 0$
- ✓ Parametric form: $x = x_1 + r\,cos\theta,\ y = y_1 + r\,sin\theta$

  General form: $x^2 + y^2 + 2gx + 2fy + c = 0$
- ✓ Centre at $(-g, -f)$ and Radius is $\sqrt{(g^2 + f^2 - c)}$

  If $g^2 + f^2 > c \Rightarrow$ Circle is real, if $g^2 + f^2 = c \Rightarrow$ Circle is a point circle and if $g^2 + f^2 < c \Rightarrow$ Circle is imaginary

Intercept with x-axis $= 2\sqrt{(g^2 - c)}$, Intercept with y-axis $= 2\sqrt{(f^2 - c)}$.

Time saving results

The equation of the circles with centre (a, b) and

- ➢ Touching **x-axis**: $x^2 + y^2 + 2gx + 2fy + g^2 = 0$
- ➢ Circle touching **y-axis**: $x^2 + y^2 + 2gx + 2fy + f^2 = 0$
- ➢ Circle touching **both axes**: $x^2 + y^2 + 2gx + 2gy + g^2 = 0$
- ➢ Circle through **origin**: $x^2 + y^2 + 2gx + 2fy = 0$
- ➢ Circle with centre on x-axis: $x^2 + y^2 + 2gx + c = 0$
- ➢ Circle with centre on y-axis: $x^2 + y^2 + 2fy + c = 0$

- ✍ If (x_1, y_1) is one end of the diameter of the circle $x^2 + y^2 + 2gx + 2fy + c = 0$ then the other end is $(-2g - x_1, -2f - y_1)$.
- ✍ Equation of the circle passing through points (0,0), (a,0) and (0,b) is

$$x^2 + y^2 - ax - by = 0$$

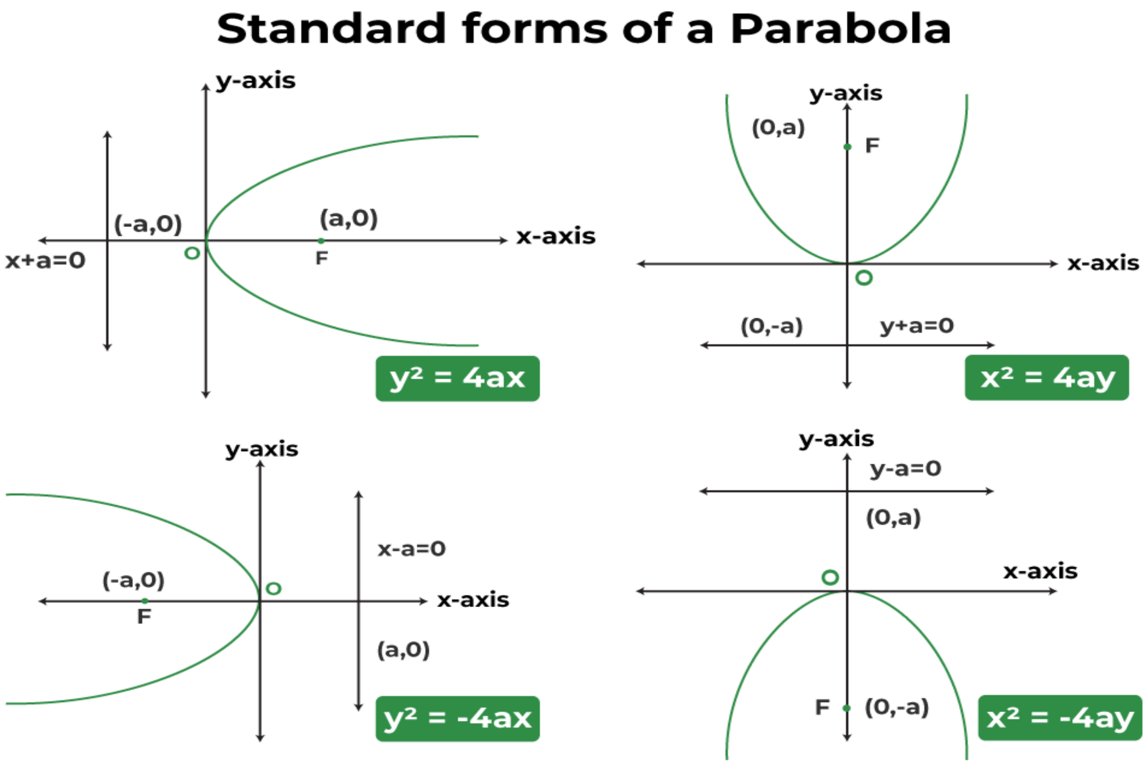
- ✍ Equation of the point circle with centre at (a, b) is

$$x^2 + y^2 - 2ax - 2by + (a^2 + b^2) = 0.$$

- ✍ The equation of the circum-circle of the triangle formed by line

  $ax + by + c = 0\ (c \neq 0)$ with co-ordinate axes is $ab(x^2 + y^2) + c(bx + ay) = 0.$

The Parabola



The equation of parabola in standard form is

$$y^2 = 4ax, x^2 = 4ay, y^2 = -4ax \text{ and } x^2 = -4ay.$$

$y^2 = \pm 4ax$	$x^2 = \pm 4ay$
➢ The focus is $(\pm a, 0)$ ➢ The directrix is $x \pm a = 0$ ➢ The latus rectum is $x \mp a = 0$ ➢ The length of the latus rectum is 4a ➢ The extremities of the latus rectum are $(\pm a, 2a)$ and $(\pm a, -2a)$	➢ The focus is $(0, \pm a)$ ➢ The directrix is $y \pm a = 0$ ➢ The latus rectum is $y \mp a = 0$ ➢ The length of the latus rectum is 4a ➢ The extremities of the latus rectum are $(2a, \pm a)$ and $(-2a, \pm a)$

Time Saving Results :

❖ Distance of a point $P(x_1, y_1)$ on the parabola $y^2 = 4ax$ from the focus S is called focal-distance and is given by $x_1 + a$.

❖ The area of triangle inscribed in a parabola $y^2 = 4ax$ is

$$(1 / 8a)|(y_1 - y_2)(y_2 - y_3)(y_3 - y_1)|.$$

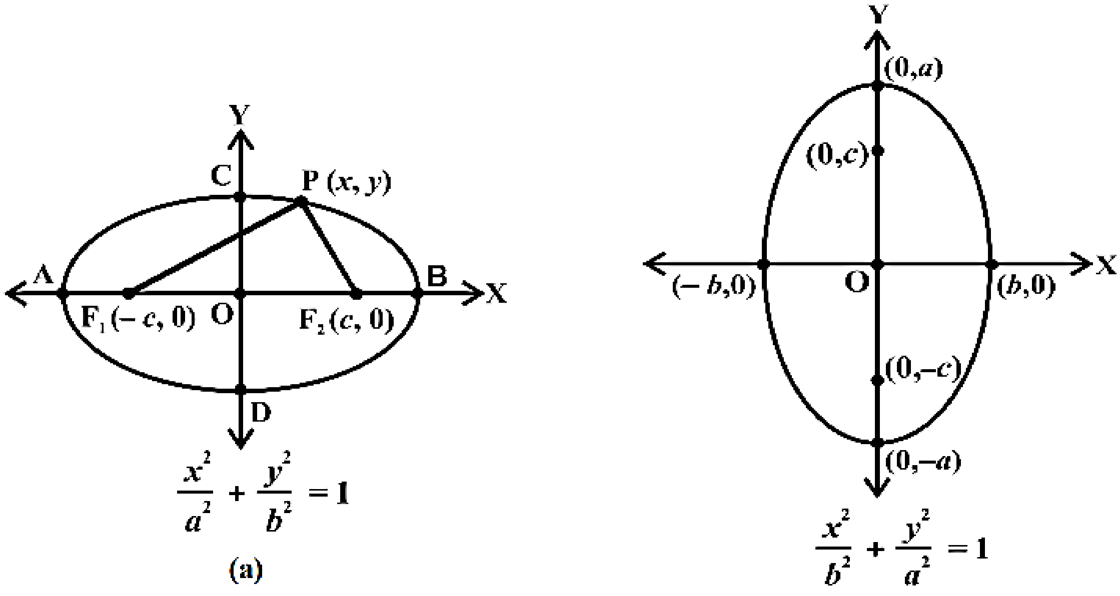
❖ If PQ is a focal chord of the parabola $y^2 = 4ax$ with focus at S then

$$(2 \cdot SL \cdot SL') / (SL + SL') = 2a \text{ i.e., } 1/SL + 1/SL' = 1/a$$

❖ If PQ is a focal chord of the parabola $y^2 = 48x$ with focus at S then

$$(2 \cdot SL \cdot SL') / (SL + SL') = 2a$$

Ellipse



$$\frac{x^2}{a^2}+\frac{y^2}{b^2}=1 \quad \text{(a)} \qquad \frac{x^2}{b^2}+\frac{y^2}{a^2}=1 \quad \text{(b)}$$

Fig 10.24

The equation of ellipse in standard form is $x^2/a^2 + y^2/b^2 = 1, (a > b)$

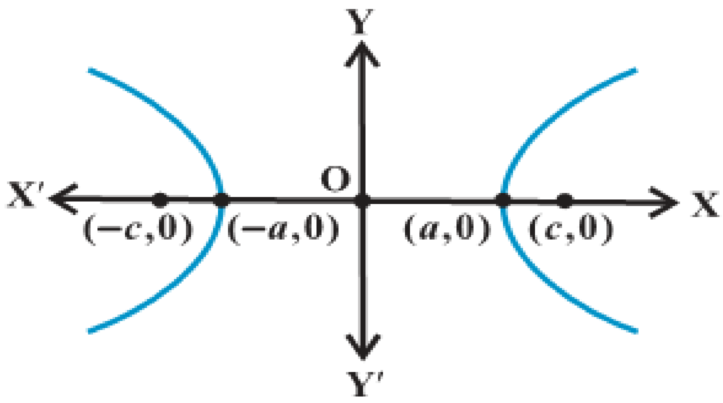
If the center of the ellipse is (h, k), then the equation is $(x - h)^2/a^2 + (y - k)^2/b^2 = 1$

$\boldsymbol{x^2/a^2 + y^2/b^2 = 1, (a > b)}$ **(horizontal ellipse)**	$\boldsymbol{x^2/a^2 + y^2/b^2 = 1, (b > a)}$ **(vertical ellipse)**
❖ The eccentricity is $e = \sqrt{(1 - b^2/a^2)}$	❖ The eccentricity is $e = \sqrt{(1 - a^2/b^2)}$
❖ The major axis is $y = 0$	❖ The major axis is $x = 0$
❖ The length of the major axis is $2a$	❖ The length of the major axis is $2b$
❖ The minor axis is $x = 0$	❖ The minor axis is $y = 0$
❖ The length of the minor axis is $2b$	❖ The length of the minor axis is $2a$
❖ The foci are $(\pm ae, 0)$	❖ The foci are $(0, \pm be)$
❖ The directrices are $x = \pm a/e$	❖ The directrices are $y = \pm b/e$
❖ The latus recta are $x = \pm ae$	❖ The latus recta are $y = \pm be$
❖ The length of the latus rectum is $2b^2/a$	❖ The length of the latus rectum is $2a^2/b$

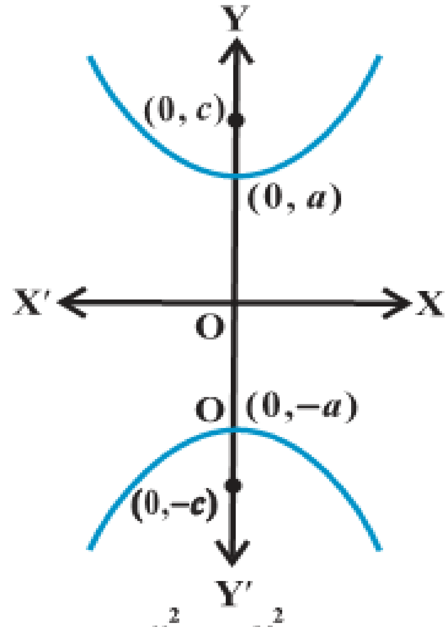
Time saving results

- Distance between the foci of the ellipse $x^2/a^2 + y^2/b^2 = 1$ when $a > b$ is given by $2\sqrt{(a^2 - b^2)}$ and when $b > a$ is given by $2\sqrt{(b^2 - a^2)}$.
- Distance between directrices for ellipse $x^2/a^2 + y^2/b^2 = 1$ when $a > b$ is $2a^2/\sqrt{(a^2 - b^2)}$ and when $b > a$ is $2a^2/\sqrt{(b^2 - a^2)}$.
- Area of the greatest rectangle that can be inscribed in the ellipse $x^2/a^2 + y^2/b^2 = 1$ is given by $2ab$.

Hyperbola



$$\frac{x^2}{a^2}-\frac{y^2}{b^2}=1$$



$$\frac{y^2}{a^2}-\frac{x^2}{b^2}=1$$

$\boldsymbol{x^2/a^2 - y^2/b^2 = 1}$ **(horizontal hyperbola)**	$\boldsymbol{x^2/a^2 - y^2/b^2 = -1}$ **(vertical hyperbola):**
✓ The eccentricity is $e = \sqrt{(1 + b^2/a^2)}$	✓ The eccentricity is $e = \sqrt{(1 + a^2/b^2)}$
✓ The transverse axis is $y = 0$	✓ The transverse axis is$y = 0$
✓ The length of the transverse axis is $2a$	✓ The length of the transverse axis is $2b$
✓ The conjugate axis is$x = 0$	✓ The conjugate axis is $x = 0$
✓ The length of the conjugate axis is $2b$	✓ The length of the conjugate axis is $2a$
✓ The foci are $(\pm ae, 0)$	✓ The foci are $(0, \pm be)$
✓ The directrices are $x = \pm a/e$	✓ The directrices are $y = \pm b/e$
✓ The latus recta are $x = \pm ae$	✓ The latus recta are$y = \pm be$
✓ The length of the latus recta is $2b^2/a$	✓ The length of the latus recta is $2a^2/b$

Let S and S' be the foci and P is any point on the hyperbola, then $|PS - PS'| = 2a$.

Time Saving Results

- Distance between the foci of the hyperbola $x^2/a^2 - y^2/b^2 = 1$ or $x^2/a^2 - y^2/b^2 = -1$ is given by $2\sqrt{(a^2 + b^2)}$.
- Distance between directrices for $x^2/a^2 - y^2/b^2 = 1$ is $2a^2/\sqrt{(a^2 + b^2)}$ &
- for $x^2/a^2 - y^2/b^2 = -1$ is $2b^2/\sqrt{(a^2 + b^2)}$.
- Equations of directrices for $x^2/a^2 - y^2/b^2 = 1$ are $x = \pm a^2/\sqrt{(a^2 + b^2)}$ &
- for $x^2/a^2 - y^2/b^2 = -1$ are $y = \pm b^2/\sqrt{(a^2 + b^2)}$.

Circles:

1. The equation of the circle with center $(1, -2)$ and radius $\sqrt{13}$.

(A) $x^2 + y^2 + 4x - 2y = 8$ (B) $x^2 + y^2 - 2x + 4y = 8$

(C) $x^2 + y^2 - 2x + 4y = 13$ (D) $x^2 + y^2 - 4x - 2y = 13$

2. Find the center and radius of the circle $(x - 3)^2 + (y + 2)^2 = 16$.

(A) $(3, -2), r = 4$ (B) $(-3, 2), r = 4$

(C) $(3, -2), r = 16$ (D) $(-3, 2), r = 16$

3. The equation of the $x^2 + y^2 - 4x + 6y - 12 = 0$ represents a circle. Its center is:

(A) (2, -3) (B) (-2, 3) (C) (4, -6) (D) (-4, 6)

4. What is the radius of the circle $x^2 + y^2 - 4x + 6y - 12 = 0$?

(A) 3 (B) 4 (C) 5 (D) 25

5. The equation of a circle in the first quadrant and touching each coordinate axis at distance of one unit from the origin is

(A) $x^2 + y^2 - 2x - 2y + 1 = 0$ (B) $x^2 + y^2 - 2x - 2y - 1 = 0$

(C) $x^2 + y^2 - 2x - 2y = 0$ (D) $x^2 + y^2 - 2x + 2y - 1 = 0$

6. Equation of circle with centre$(-a, -b)$ and radius $\sqrt{a^2 - b^2}$ is

(A) $x^2 + y^2 - 2ax - 2by - 2b^2 = 0$ (B) $x^2 + y^2 + 2ax + 2by + 2b^2 = 0$

(C)$x^2 + y^2 - 2ax - 2by + 2b^2 = 0$ (D) $x^2 + y^2 - 2ax + 2by + 2b^2 = 0$

7. Find the equation of the circle passing through the points (0,0), (a,0), and (0,b).

(A) $x^2 + y^2 - 2ax - 2by = 0$ (B) $x^2 + y^2 + ax + by = 0$

(C) $x^2 + y^2 - ax - by = 0$ (D) $x^2 + y^2 + 2ax + 2by = 0$

8. The equation of a circle having endpoints of a diameter at (1, 2) and (3, 4) is:

(A) $x^2 + y^2 - 4x - 6y + 11 = 0$ (B) $x^2 + y^2 + 4x + 6y + 11 = 0$

(C) $x^2 + y^2 - 4x - 6y - 11 = 0$ (D) $x^2 + y^2 - 2x - 3y + 5 = 0$

9. If a circle whose centre is $(1, -3)$ touches the line $3x - 4y - 5 = 0$, then the radius of the circle is

(A)8 (B) 4 (C) 6 (D) 2

10. If the equation $x^2 + y^2 + 2gx + 2fy + c = 0$ represents a point circle, then its radius is:

(A) 1 (B) 0 (C) -1 (D) Undefined

11. The circle $x^2 + y^2 + 2gx + 2fy + c = 0$ touches the x-axis if:

(A) $g^2 = c$ (B) $f^2 = c$ (C) $g^2 + f^2 = c$ (D) $g^2 = f^2$

12. The circle $x^2 + y^2 + 2gx + 2fy + c = 0$ touches the y-axis if:

(A) $g^2 = c$ (B) $f^2 = c$ (C) $g^2 + f^2 = c$ (D) $g^2 = f^2$

13. **The area of the circle centered at$(1, 2)$ and passing through the point $(4, 6)$**

(A) 25π (B) 5π (C) 10π (D) 50π

14. **If the point (1, 2) lies inside the circle $x^2 + y^2 - 4x + 2y + k = 0$, then k must satisfy:**

(A) k< -3 (B) k >3 (C) k < 3 (D) k > -3

15. **If the point (2, 3) lies on the circle $x^2 + y^2 - 4x - 6y + c = 0$, then c is**

(A) 13 (B) -13 (C) 0 (D) 9

16. **The length of the intercept made by the circle $x^2 + y^2 - 6x + 4y - 12 = 0$ on the x-axis is**

(A) $2\sqrt{21}$ (B) $\sqrt{21}$ (C) 10 (D) 5

17. **The length of the intercept made by the circle $x^2 + y^2 - 6x + 4y - 12 = 0$ on the y-axis is**

(A) 8 (B) 4 (C) $2\sqrt{16}$ (D) 10

18. **The lines $2x - 3y = 5$ and $3x - 4y = 7$ are the diameters of a circle of area 154 square units. The equation of the circle is**

(A) $x^2 + y^2 + 2x - 2y = 62$ (B) $x^2 + y^2 - 2x + 2y = 47$

(C)$x^2 + y^2 + 2x - 2y = 47$ (D) $x^2 + y^2 - 2x + 2y = 62$

19. **The equation of the circle with center (2, -1) and touching the line$3x - 4y + 5 = 0$is:**

(A) $(x - 2)^2 + (y + 1)^2 = 9$ (B) $(x - 2)^2 + (y + 1)^2 = 25$

(C) $(x + 2)^2 + (y - 1)^2 = 9$ (D) $(x - 2)^2 + (y + 1)^2 = 3$

20. **The parametric equations of the circle $x^2 + y^2 = R^2$ are:**

(A) $x = R\cos\theta, y = R\sin\theta$ (B) $x = R\sec\theta, y = R\tan\theta$

(C) $x = R\tan\theta, y = R\sec\theta$ (D) $x = R\sin\theta, y = R\cos\theta$

21. **The equation $ax^2 + by^2 + 2hxy + 2gx + 2fy + c = 0$ will represent a circle, if**

(A) $a = b = 0$and$c = 0$ (B) $f = g$ and $h = 0$

(C) $a = b \neq 0$ and $h = 0$ (D) $f = g$ and $c = 0$

22. **If a circle touches both axes and has radius 3 in the first quadrant, its equation is:**

(A) $x^2 + y^2 - 6x - 6y + 9 = 0$ (B) $x^2 + y^2 + 6x + 6y + 9 = 0$

(C) $x^2 + y^2 - 3x - 3y + 9 = 0$ (D) $x^2 + y^2 - 6x - 6y + 18 = 0$

23. **The equation of the circle concentric with the circle $x^2 + y^2 - 4x - 6y - 3 = 0$ and touching y axis is:**

(A) $x^2 + y^2 - 4x - 6y - 9 = 0$ (B) $x^2 + y^2 - 4x - 6y + 9 = 0$

(C) $x^2 + y^2 - 4x - 6y + 3 = 0$ (D) None of these

24. The position of the point (1, 1) relative to the circle $x^2 + y^2 = 9$ is:

(A) Inside the circle (B) Outside the circle

(C) On the circle (D) At the center

25. Find the equation of the circle passing through (0,0) and having intercepts 4 and 6 on positive x and y axes respectively.

(A) $x^2 + y^2 - 4x - 6y = 0$ (B) $x^2 + y^2 + 4x + 6y = 0$

(C) $x^2 + y^2 - 6x - 4y = 0$ (D) $x^2 + y^2 - 8x - 12y = 0$

Parabolas:

26. If the focus of the parabola is $(0, -3)$ and its directrix is $y = 3$, then the equation is

(A) $x^2 = 12y$ (B) $x^2 = -12y$ (C) $y^2 = -12x$ (D) $y^2 = 12x$

27. The equation of the directrix of the parabola $y^2 = 12x$.

(A) $x = -3$ (B) $x = 3$ (C) $y = -3$ (D) $y = 3$

28. The length of the latus rectum of the parabola $y^2 = -16x$.

(A) -16 (B) 16 (C) 4 (D) 8

29. The coordinates of the focus of the parabola $x^2 = 8y$.

(A) (0, 2) (B) (2, 0) (C) (0, -2) (D) (-2, 0)

30. The focal distance of a point on the parabola $y^2 = 16x$ whose ordinate is twice the abscissa, is

(A) 6 (B) 8 (C) 1 (D) 12

31. If the parabola $y^2 = 4ax$ passes through the point (3,-2),then the length of its latus rectum is

(A) $\frac{2}{3}$ (B) $\frac{4}{3}$ (C) $\frac{1}{3}$ (D) 4

32. Find the equation of the parabola with vertex at (0,0) and focus at (5, 0).

(A) $y^2 = 20x$ (B) $y^2 = -20x$ (C) $x^2 = 20y$ (D) $x^2 = -20y$

33. Find the equation of the parabola with vertex (0,0), axis along x-axis, and passing through (2, 3).

(A) $2y^2 = 9x$ (B) $y^2 = 9x$ (C) $y^2 = 4.5x$ (D) $x^2 = 4.5y$

34. Find the axis of symmetry for the parabola $x^2 = -8y$.

(A) $y - axis\ (x = 0)$ (B) $x - axis\ (y = 0)$ (C) $x = 2$ (D) $y = -2$

35. The length of latus rectum of the parabola $4y^2 + 3x + 3y + 1 = 0$ is: (KCET 2016)

(A) $\frac{4}{3}$ (B) 7 (C) 12 (D) $\frac{3}{4}$

36. The area of the triangle formed by the lines joining the vertex of the parabola $x^2 = 12y$ to the ends of its latus rectum is

(A) 12 $sq.units$ (B)16 $sq.units$ (C) 18 $sq.units$ (D) 24 $sq.units$

37. Find the focal distance of the point (4, 4) on the parabola $y^2 = 4x$.

(A) 5 (B) 4 (C) 3 (D) 6

38. The axis of the parabola $y^2 + 4x + 2y - 3 = 0$ is parallel to

(A) $x - axis$ (B) $y - axis$ (C) line $y = x$ (D) line $y = -x$

39. The vertex of the parabola $3x - 2y^2 - 4y + 7 = 0$ is

(A) $(3, 1)$ (B) $(-3, -1)$ (C) $(-3, 1)$ (D) none of these

40. Find the focus of the parabola $(y - 2)^2 = 8(x + 3)$.

(A) (-1, 2) (B) (-3, 2) (C) (1, 2) (D) (-5, 2)

41. The equation of the directrix of the parabola $(x - 1)^2 = 12(y + 2)$ is:

(A) y = -5 (B) y = 1 (C) y = -2 (D) x = -2

42. Which of the following points lies on the parabola?$y^2 = 8x$.

(A) (2, 4) (B) (2, 2) (C) (4, 2) (D) (1, 4)

43. The parametric equations of the parabola $y^2 = 4ax$ are:

(A) $x = at^2, y = 2at$ (B) $x = 2at, y = at^2$

(C) $x = a\cos t, y = a\sin t$ (D) $x = a\sec t, y = a\tan t$

44. The end points of the latus rectum of parabola $y^2 = 4ax$ are:

(A) (a, 2a) and (a, -2a) (B) (-a, 2a) and (-a, -2a)

(C) (2a, a) and (-2a, a) (D) (a, a) and (a, -a)

45. The length of latus rectum of parabola $y^2 = 4ax$ in terms of semi-latus rectum 'l' is:

(A) $2l$ (B) l (C) $4l$ (D) $l/2$

46. If the parabola $x^2 = 4ay$ passes through the point (2, 1), then the length of the latus rectum is **(KCET 2020)**

(A) 8 (B)1 (C) 4 (D) 2

47. The eccentricity of any parabola is always equal to:

(A) Less than 1 (B) Greater than 1 (C) 0 (D) 1

48. The equation of parabola whose focus is $(6, 0)$ and directrix is $x = -6$is(KCET2024)

(A) $y^2 = 24x$ (B) $y^2 = -24x$ (C) $x^2 = 24y$ (D) $x^2 = -24y$

49. The line $y = mx + c$ is tangent to parabola $y^2 = 4ax$ if c is equal to:

(A) a / m (B) $a\,m$ (C) a / m^2 (D) $-a / m$

50. The area of the triangle formed by the lines joining the vertex of $y^2 = 4ax$ to the ends of its latusrectum is:

(A) a^2 (B) $2a^2$ (C) $4a^2$ (D) $a^2/2$

Ellipses

51. Find the length of major and minor axes of the ellipse $x^2/25 + y^2/9 = 1$.

(A) Major = 10, Minor = 6 (B) Major = 25, Minor = 9
(C) Major = 5, Minor = 3 (D) Major = 12, Minor = 8

52. Find the coordinates of the foci of the ellipse $9x^2 + 25y^2 = 225$.

(A) (±5, 0) (B) (0, ±5) (C) (±3, 0) (D) (±4, 0)

53. The eccentricity of the ellipse $9x^2 + 25y^2 = 225$ is

(A) 4/5 (B) 3/5 (C) 3/4 (D) 5/4

54. Find the length of the latus rectum of the ellipse $x^2/25 + y^2/9 = 1$.

(A) 18/5 (B) 9/5 (C) 8/5 (D) 25/9

55. Find the vertices of the ellipse $x^2/16 + y^2/25 = 1$.

(A) (0, ±5) (B) (±4, 0) (C) (0, ±4) (D) (±5, 0)

56. Find the foci of the ellipse $x^2/16 + y^2/25 = 1$.

(A) (0, ±3) (B) (±3, 0) (C) (0, ±5) (D) (±4, 0)

57. If the latus rectum of an ellipse be equal to half of its minor axis, then its eccentricity is.

(A) $3/2$ (B) $\sqrt{3}/2$ (C) $2/3$ (D) $\sqrt{2}/3$

58. If the foci and vertices of an ellipse be $(\pm 1, 0)$and $(\pm 2, 0)$, then the minor axis of the ellipse is.

(A) $2\sqrt{5}$ (B) 2 (C) $2\sqrt{3}$ (D) 4

59. Find the equation of the ellipse with vertices (±6, 0) and foci (±4, 0).

(A) $x^2/36 + y^2/20 = 1$ (B) $x^2/36 + y^2/16 = 1$
(C) $x^2/20 + y^2/36 = 1$ (D) $x^2/16 + y^2/36 = 1$

60. The eccentricity of an ellipse is 2/3, latus rectum is 5 and centre is (0, 0). The equation of the ellipse is

(A) $x^2/45 + y^2/81 = 1$ (B) $x^2/81 + y^2/45 = 1$
(C) $x^2/25 + y^2/169 = 1$ (D) $x^2/169 + y^2/25 = 1$

61. Find the equation of the ellipse with length of major axis 20 and foci (0, ±5).

(A) $x^2/75 + y^2/25 = 1$ (B) $x^2/100 + y^2/75 = 1$
(C) $x^2/25 + y^2/100 = 1$ (D) $x^2/75 + y^2/100 = 1$

62. **The sum of focal distances of any point on the ellipse $x^2/a^2 + y^2/b^2 = 1\,(a > b)$ is equal to:**

(A) a (B) 2a (C) b (D) 2b

63. **The distance between the foci of the ellipse $x^2/a^2 + y^2/b^2 = 1$ is:**

(A) ae (B) a/e (C) 2a/e (D) 2ae

64. **The distance between the directrices of the ellipse $x^2/a^2 + y^2/b^2 = 1\,(a > b)$ is:**

(A) a/e (B) 2ae (C) 2a/e (D) ae

65. **The eccentricity of the ellipse if its latus rectum is equal to half of its major axis is**

(A) $1/2$ (B) $1/\sqrt{2}$ (C) $\sqrt{3}/2$ (D) $1/4$

66. **The eccentricity of the ellipse if its latus rectum is equal to half of its minor axis is**

(A) $1/2$ (B) $\sqrt{3}/2$ (C) $1/\sqrt{2}$ (D) $3/4$

67. **The equation of the ellipse centered at origin, major axis on x-axis, passing through (4, 3) and (-1, 4).**

(A) $7x^2 + 15y^2 = 247$ (B) $x^2 + y^2 = 25$

(C) $15x^2 + 7y^2 = 247$ (D) $x^2/16 + y^2/9 = 1$

68. **If the centre, one of the foci and semi-major axis of an ellipse be $(0,0), (0,3)$ and 5 then its equation is**

(A) $\frac{x^2}{16}+\frac{y^2}{25}=1$ (B) $\frac{x^2}{25}+\frac{y^2}{16}=1$ (C) $\frac{x^2}{9}+\frac{y^2}{25}=1$ (D) $\frac{x^2}{25}+\frac{y^2}{9}=1$

69. **If the length of the major axis of an ellipse is three times the length of its minor axis, then its eccentricity is**

(A) $1/3$ (B) $1/\sqrt{3}$ (C) $1/\sqrt{2}$ (D) $2\sqrt{2}/3$

70. **Find the center of the ellipse $9x^2 + 4y^2 - 18x + 16y - 11 = 0$.**

(A) (1, -2) (B) (-1, 2) (C) (2,1) (D) (-2, 1)

71. **The equation $\frac{x^2}{2-r}+\frac{y^2}{r-5}+1=0$ represents an ellipse, if**

(A) $r > 2$ (B) $2 < r < 5$ (C) $r > 5$ (D) None of these

72. **$P$is any point on the ellipse $9x^2 + 36y^2 = 324$, whose foci are S and S'. Then $SP + S'P$ equals**

(A) 3 (B) 12 (C) 36 (D) 324

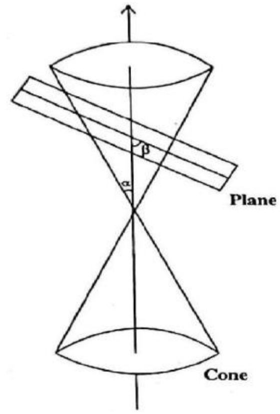
73. **The length of the latus rectum of $x^2 + 3y^2 = 12$ is** **(KCET2025)**

(A) $\frac{1}{3}units$ (B) $\frac{4}{\sqrt{3}}units$ (C) $24units$ (D) $\frac{2}{3}units$

74. **The area enclosed by the ellipse $x^2/a^2 + y^2/b^2 = 1$ is:**

(A) $\pi\, ab$ (B) $2\pi\, ab$ (C) $\pi(a^2 + b^2)$ (D) $4\pi\, ab$

75. **In the figure (KCET2026)**



Statement I: When $\alpha > \beta \geq 0$, the section is hyperbola

Statement II: When $\beta > 90°$, the section is ellipse

Which of the following is correct?

(A) Statement I is true, Statement II is false

(B) Statement I is false, Statement II is true

(C) Both the Statements are true

(D) Both the Statements are false

Hyperbolas

76. **Find the vertices of the hyperbola $x^2/9 - y^2/4 = 1$.**

(A) (±3, 0) (B) (0, ±3) (C) (±2, 0) (D) (0, ±2)

77. **Find the foci of the hyperbola $x^2/16 - y^2/9 = 1$.**

(A) (±4, 0) (B) (0, ±4) (C) (±5, 0) (D) (±3, 0)

78. **Find the eccentricity of the hyperbola $x^2/64 - y^2/36 = 1$.**

(A) 5/3 (B) 4/5 (C) 5/4 (D) 3/5

79. **Find the length of the latus rectum of the hyperbola $x^2/16 - y^2/9 = 1$.**

(A) 9/2 (B) 9/4 (C) 18/5 (D) 8/3

80. **The length of the transverse axis along x-axis with centre at the origin of a hyperbola is 7 and it passes through the point $(5, -2)$. The equation of hyperbola is**

(A) $\frac{4x^2}{16} - \frac{196y^2}{51} = 1$ (B) $\frac{49x^2}{4} - \frac{51y^2}{196} = 1$

(C) $\frac{4x^2}{49} - \frac{51y^2}{196} = 1$ (D) None of these

81. The distance between the foci of a hyperbola is 16 and its eccentricity is $\sqrt{2}$. Its equation is

(A) $x^2 - y^2 = 32$ (B) $\frac{x^2}{4} - \frac{y^2}{9} = 1$ (C) $2x^2 - 3y^2 = 7$ (D) None of these

82. The eccentricity of the hyperbola whose latus rectum is 8 and conjugate axis is equal to half of the distance between the foci is

(A) $\frac{4}{3}$ (B) $\frac{4}{\sqrt{3}}$ (C) $\frac{2}{\sqrt{3}}$ (D) None of these

83. The equation of the hyperbola with eccentricity $\frac{3}{2}$ and foci at $(\pm 2, 0)$ is

(A) $\frac{x^2}{4} - \frac{y^2}{5} = \frac{4}{9}$ (B) $\frac{x^2}{9} - \frac{y^2}{9} = \frac{4}{9}$ (C) $\frac{x^2}{4} - \frac{y^2}{9} = 1$ (D) None of these

84. The equation of the hyperbola with foci (±5, 0) and transverse axis of length 8, is

(A) $x^2/9 - y^2/16 = 1$ (B) $x^2/16 - y^2/9 = 1$

(C) $y^2/16 - x^2/9 = 1$ (D) $x^2/25 - y^2/16 = 1$

85. Find the equation of the hyperbola with foci (0, ±13) and conjugate axis of length 24.

(A) $y^2/144 - x^2/25 = 1$ (B) $x^2/25 - y^2/144 = 1$

(C) $y^2/25 - x^2/144 = 1$ (D) $x^2/144 - y^2/25 = 1$

86. The eccentricity of a rectangular hyperbola is always:

(A) 1 (B) 2 (C) $\sqrt{2}$ (D) $1/\sqrt{2}$

87. The equation $x^2 - y^2 = a^2$ represents a:

(A)Parabola (B) Rectangular hyperbola (C) Ellipse (D) Circle

88. The difference of focal distances of any point on a hyperbola is equal to:

(A) 2a (length of transverse axis) (B) 2b (length of conjugate axis)

(C) 2c (D) a + b

89. Find the distance between the foci of the hyperbola $x^2/9 - y^2/16 = 1$.

(A) 5 (B) 6 (C) 8 (D) 10

90. Find the distance between directrices of the hyperbola $x^2/16 - y^2/9 = 1$.

(A) 32 / 5 (B) 16 / 5 (C) 8 / 5 (D) 25 / 4

91. A point on the curve $\frac{x^2}{A^2} - \frac{y^2}{B^2} = 1$ is

(A) $(A\cos\theta, B\sin\theta)$ (B) $(A\sec\theta, B\tan\theta)$

(C) $(A\cos^2\theta, B\sin^2\theta)$ (D) None of these

92. If e_1 and e_2 are the eccentricities of a hyperbola and its conjugate hyperbola, then $1/{e_1}^2 + 1/{e_2}^2 =$:

(A) 0 (B) 1 (C) 2 (D) 1/2

93. The asymptote equations for the hyperbola $x^2/a^2 - y^2/b^2 = 1$ are:

(A) $y = \pm(a/b)\,x$ (B) $y = \pm(b/a)\,x$ (C) $y = \pm x$ (D) $y = \pm(b^2/a)\,x$

94. If the length of the transverse and conjugate axes of a hyperbola be 8 and 6 respectively, then the difference of focal distances of any point of the hyperbola will be

(A) 2 (B) 6 (C) 8 (D) 14

95. The equation of hyperbola with vertices $(\pm 2, 0)$ and foci $(\pm 3, 0)$.

(A) $x^2/4 - y^2/5 = 1$ (B) $x^2/4 - y^2/9 = 1$

(C) $x^2/5 - y^2/4 = 1$ (D) $x^2/9 - y^2/4 = 1$

96. Find the length of transverse axis for the hyperbola $9x^2 - 16y^2 = 144$.

(A) 6 (B) 8 (C) 10 (D) 12

97. Find the center of the hyperbola $9x^2 - 16y^2 - 18x + 32y - 151 = 0$.

(A) (1, 1) (B) (-1, 1) (C) (1, -1) (D) (-1, -1)

98. The conic section represented by $xy = c^2$ ($c \neq 0$) is a:

(A) Circle (B) Parabola (C) Ellipse (D) Rectangular Hyperbola

99. If the distance betweenthe two foci of hyperbola is $2c$ and the distance of its two vertices is 2a, then

Statement I: The length of transverse axis is 2a

Statement II : The length of conjugate axis is $2b$, where $b = \sqrt{c^2 + a^2}$

Which of the following is correct?

(A) Statement I is true, Statement II is false

(B) Statement I is false, Statement II is true

(C) Both the Statements are true

(D) Both the Statements are false

100. For the hyperbola$9(x - 1)^2 - 16(y - 1)^2 = 144$, the length of latus rectum is:

(A) 9/2 (B) 9/4 (C) 18/5 (D) 8/3

CONIC SECTIONS									
1	***2***	***3***	***4***	***5***	***6***	***7***	***8***	***9***	***10***
B	A	A	C	A	B	C	A	D	B
11	***12***	***13***	***14***	***15***	***16***	***17***	***18***	***19***	***20***
A	B	B	C	A	A	A	A	A	A
21	***22***	***23***	***24***	***25***	***26***	***27***	***28***	***29***	***30***
C	A	B	A	A	B	A	B	A	B
31	***32***	***33***	***34***	***35***	***36***	***37***	***38***	***39***	***40***
B	A	A	A	D	C	A	A	B	A
41	***42***	***43***	***44***	***45***	***46***	***47***	***48***	***49***	***50***
A	A	A	A	A	B	D	A	A	B
51	***52***	***53***	***54***	***55***	***56***	***57***	***58***	***59***	***60***
A	D	B	A	A	A	C	D	A	B
61	***62***	***63***	***64***	***65***	***66***	***67***	***68***	***69***	***70***
D	B	D	C	B	B	A	A	D	A
71	***72***	***73***	***74***	***75***	***76***	***77***	***78***	***79***	***80***
B	*C*	*B*	*A*	*A*	*A*	*C*	*C*	*A*	*C*
81	***82***	***83***	***84***	***85***	***86***	***87***	***88***	***89***	***90***
A	*C*	*A*	*B*	*C*	*C*	*B*	*A*	*D*	*A*
91	***92***	***93***	***94***	***95***	***96***	***97***	***98***	***99***	***100***
A	*B*	*B*	*C*	*A*	*B*	*A*	*D*	*A*	*A*