MATHS

BOOKS - KUMAR PRAKASHAN KENDRA MATHS (GUJRATI ENGLISH)

CONIC SECTIONS

Practice Work

1. Obtain equation of circle in Centre $\left(\sqrt{2}, -\sqrt{5}\right)$ and radius $\sqrt{5}$.

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2. Obtain equation of circle in Centre $\left(\sqrt{-4}\cos\alpha, 4\sin\alpha\right)$ and radius 5.

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3. Obtain equation of circle in Centre (a,a) and radius $\sqrt{2a}$.

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4. Obtain equation of circle in Centre (2,-3) and radius $\sqrt{2a}$.

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5. Obtain equation of circle in Centre of origin and radius r = 6.

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6. Obtain equation of circle in Centre (-3,4) Touches X - axis.

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7. Obtain equation of circle in Centre (3,4) Touches X - axis.

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8. Obtain equation of circle in Touches both axis and radius 5 unit.

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9. Find the centre and radius of equation of circle in $x^2 + y^2 - 4x + 6y = 5$

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10. Find the centre and radius of equation of circle in $x^2 + y^2 - x + 2y - 3 = 0$

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11. Obtain equation of circle in $(x - 1)^2 + y^2 = 4$

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12. Obtain equation of circle in $x^2 + y^2 - 2x - 2y + 1 = 0$

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13. Obtain equation of circle in $x^2 + y^2 - x + y = 0$

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14. Prove that the equation $3x^2 + 3y^2 - 5x + 6y + 8 = 0$ does not represent circle.

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15. Prove that the centres of the circle $x^2 + y^2 - 4x - 2y + 4 = 0, x^2 + y^2 - 2x - 4y + 1 = 0$ and $x^2 + y^2 + 2x$

are collinear. More over prove that their radii are in geometric pregression.

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16. Find the equation of the circle which passes through the point $(2, -2)$, and $(3, 4)$ and whose centre lies on the line$x + y = 2$.

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17. Find equation of the circle passes through points (2,3) and (4,5) whose centre lies on the line y - 4x + 3 = 0.

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18. Obtain the equation of he circle circum circle of the triangle with verticies (-2,3), (5, 2) and (6, -1).

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19. Find equation of the circle passes from the points (1, 2) , (3,-4) and (5, -6).

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20. Find equation of the circle concentric with the circle $x^2 + y^2 - 6x + 12y + 15 = 0$ and whose area is double then the area of given circle.

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21. Obtain equation of the circle which makes intercept of leght 6 unit on X - axis and touches Y - axis at the distance 4 unit from the origin.

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22. Find equation of the circle which touches circle $x^2 + y^2 - 2x - 4y - 20 = 0$ of point (5,5) externally and radius is 5 unit.

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23. Line y = 2x I chord of the circle $x^2 + y^2 - 10x = 0$. Derive equaiton of the circle whose diameter is chord.

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24. Obtain equation of the circle with centre (2,-5) and passes from point (3,2)

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25. Find k if line $y = \sqrt{3}x + k$ touches the circle $x^2 + y^2 = 16$.

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26. Find equation of circle whose end points of diameter are centres of the circle $x^2 + y^2 + 6x - 14y - 1 = 0$ and $x^2 + y^2 - 4x + 10y - 2 = 0$.

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27. Find the coordinates of the focus , axis, the question of the directrix and latus rectum of the parabola $y^2 = 8x$.

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28. Find the coordinates of the focus , axis, the question of the directrix and latus rectum of the parabola $y^2 = 8x$.

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29. Obtain the equation of the parabola with given conditions: Vertex (0,0) X-axis as axis of the parabola and passes from (1, -4).

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30. Obtain the equation of the parabola with given conditions:Focus (4,0) and directrix is $x + 4 = 0$.

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31. Obtain the equation of the parabola with given conditions:Focus (1,-1) and one vertex (2,1)

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32. Obtain the equation of the parabola with given conditions:Vertex (6, -3) equation of the directrix $3x - 5y + 1 = 0$.

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33. Obtain the equation of the parabola with given conditions:Focus (-1,2) equation of the directrix x - y + 1 = 0.

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34. One end point of the focal chord of the parabola is $\left(at_1^2, 2at_1\right)$ then find its other end point. Also prove that its lenghts is $\left(t_1 + \frac{l}{(t_1)^2}\right)$

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35. Obtain lnght of latus rectum and equation of direction of the parabola $(x+1)^2 = 4(y+2)$ by shifting origin at point (-1, -2).

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36. Distance of point P on parabola $y^2 = 12x$ is SP = 6 then find co-ordinate of point P.

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37. Length of latus rectum of ellipse $2x^2 + 81y^2 = 162$

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38. Obtain equation of ellipse satisfying given conditions Foci $(\pm 2, 0)$ and eccentricity $\frac{1}{2}$

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39. Obtain equation of ellipse satisfying given conditions Foci $(0, \pm 4)$ and eccentricity $\frac{4}{5}$

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40. Obtain equation of ellipse satisfying given conditions Eccentricity e = $\frac{2}{3}$, length of the latus rectum = 5

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41. Obtain equation of ellipse satisfying given conditions Eccentricity e = $\frac{1}{2}$ semi major axis of length = 4, Major axis is X- axis.

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42. Obtain equation of ellipse satisfying given conditions Major axis is X - axes and passes from points (4,3) and (-1, 4).

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43. In each of the following find the equation fot the ellipse that satisfies the given conditions :

Vertices $(0, \pm 13)$, foci $(0, \pm 5)$

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44. Obtain equation of ellipse satisfying given conditions Coordinates of the foci $(\pm 3, 0)$ and passes from points (4,1).

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45. Distance between two foci is 8 unit, distance between two directrix is 18 Obtain equation of ellipse satisfying given conditions unit and X-axis as major axis.

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46. Find co-ordinates of focii, equation of the directrix, length of the latus rectum, length of the major and mirror axis, the major and mirror axis, the eccentricity of each of following hyperbola.

(1) $\frac{x^2}{100} - \frac{y^2}{25} = 1$

(2) $x^2 - y^2 = 64$

(3) $2x^2 - 3y^2 = 5$

(4) $9y^2 - 16x^2 = 144$

(5) $\frac{y^2}{25} - \frac{x^2}{39} = 1$

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47. .....is the equation of hyperbola whose distance between two focii is 16 and eccentricity e = $\sqrt{2}$.

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48. Find equaiton of hyperbola satisfying given conditons Foci of hyperbola will be foci of eppipse $\frac{x^2}{25} + \frac{y^2}{9} = 1$ having eccentricity 2.

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49. Find equaiton of hyperbola satisfying given conditons Length of the conjugate axis is 7 and passes from (3,-2)

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50. Find equaiton of hyperbola satisfying given conditons Verticies $(0, \pm 7)$ and foci $\left(0, \pm \frac{28}{3}\right)$

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51. Find equaiton of hyperbola satisfying given conditons Verticies $(\pm 6, 0)$ and one directrix is x = 4.

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52. Find equaiton of hyperbola satisfying given conditons Length of the latus rectum is 8, eccentricity $\frac{3}{\sqrt{5}}$ and X - axis as major axis.

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53. Find equaiton of hyperbola satisfying given conditons Focus (1,2) eccentricity $e = \sqrt{3}$ and equation of the directrix is 2x + y - 1 = 0. (Hint : Use definition of the hyperbola).

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54. Find equaiton of hyperbola satisfying given conditons Focus (0,3), eccentricity 2 and equation of the directrix is x + y - 1 = 0. (Hint : Use definition of the hyperbola).

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55. The two supporting pillars of a suspension bridge in the shape of parabola are 30 met. High and both are 20 met. Appart from each other. The height of the bridge above the is centre is 5 met. There is a pillare of height 11.25 met. Fiind its distance from centre.

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56. The orbit of the earth around the sum is an ellipse. The sun is at one of the focus of this ellipse. If the length of its major axis of this ellipse. If the leght of its major axis of this ellipse is 30 million. Km. and eccentricity is 0,.0167 then find minimum and maximum distance of the earth from the sun.

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57. A cross - section of a parabolic reflector is shown. The diameter of opening at the focus is 10 cm. Find the equation of the parabola. Find

diameter of the opening at the focus is 10 cm. Find the equation of the parabola. Find diameter of the opening at 11 cm from the vertex.

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58. An arch is in the form of a parabola with its axis vertical. The arch is 10 m high and 5 m wide at the base. How wide is it 2 m from the vertex of the parabola ?

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59. Obtain the area of equilateral triangle inscribed in circle $x^2 + y^2 + 2gx + 2fy + c = 0$.

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60. e_1 and e_2 are eccentricities of hyperbola and conjugate hyperbola respectively then prove that $\frac{1}{e_1^2} + \frac{1}{e_2^2} = 1$.

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Exercise 11 1

1. In each of the following exercise the equation of the circle with

Centre (0,3) and radius 2

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2. In each of the following find the equation of the circle with

centre $(-2, 3)$ and radius 4

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3. In each of the following find the equation of the circle with

centre $\left(\frac{1}{2}, \frac{1}{4}\right)$ and radius $\frac{1}{12}$

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4. In each of the following find the equation of the circle with centre$(1, 1)$ and radius $\sqrt{2}$

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5. In each of the following exercise the equation of the circle with Centre (-a,b) and Radius $\sqrt{a^2 - b^2}$.

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6. In each the following find the centre and radius of circles.

$(x + 5)^2 + (y - 3)^2 = 36.$

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7. In each the following find the centre and radius of circles.

$x^2 + y^2 - 4x - 8y - 45 = 0.$

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8. In each the following find the centre and radius of circles.

$x^2 + y^2 - 8x + 10y - 12 = 0.$

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9. In each the following find the centre and radius of circles.

$2x^2 + 2y^2 - x = 0.$

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10. Find the equation of the circle passing through the points $(4, 1)$ and $(6, 5)$ and whose centre is on the line $4x + y = 16.$

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11. Find the equation of the circle passing through the points (2,3) and (-1,1) and whose centre is on the line x - 3y - 11 = 0.

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12. Find the equation of the circle with radius 5 whose centre lies on x-axis and passes through the point $(2, 3)$.

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13. Find equation of the circle passing through $(0, 0)$ and making intercepts a and b on the coordinate axes.

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14. Find the equation of a circle with centre $(2, 2)$and passes through the point $(4, 5)$.

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15. Does the point $(-2.5, 3.5)$ lie inside , outside or on the circle $x^2 + y^2 = 25$?

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Exercise 11 2

1. In each of the following find the coordinates of the focus , axis of the parabola , the equation of the directrix and the length of the latus rectum.

$y^2 = 12x.$

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2. In each of the following find the coordinates of the focus , axis of the parabola , the equation of the directrix and the length of the latus rectum.

$x^2 = 6y$

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3. In each of the following find the coordinates of the focus , axis of the parabola , the equation of the directrix and the length of the latus rectum.

$y^2 = -8x$

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4. In each of the following find the coordinates of the focus , axis of the parabola , the equation of the directrix and the length of the latus

rectum.

$x^2 = -16y$

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5. In each of the following find the coordinates of the focus , axis of the parabola , the equation of the directrix and the length of the latus rectum.

$y^2 = 10x$

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6. In each of the following find the coordinates of the focus , axis of the parabola , the equation of the directrix and the length of the latus rectum.

$x^2 = -9y$

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7. In each of the find the equation of the parabola that satisfies the given conditions :

Focus $(6, 0)$, directrix $x = -6$

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8. In each of the find the equation of the parabola that satisfies the given conditions :

Focus $(0, -3)$, directrix $y = 3$

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9. In each of the find the equation of the parabola that satisfies the given conditions :

Vertex $(0, 0)$, focus $(3, 0)$

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10. In each of the find the equation of the parabola that satisfies the given conditions :

Vertex $(0, 0)$, focus $(-2, 0)$

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11. In each of the find the equation of the parabola that satisfies the given conditions :

Vertex $(0, 0)$ passing through $(2, 3)$ and axis is along x-axis.

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12. In each of the find the equation of the parabola that satisfies the given conditions :

Vertex $(0, 0)$, passing through $(5, 2)$ and symmetric with respect to y-axis.

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Exercise 11 3

1. In each of the Find the coordinates of the foci, the vertices, the length of major axis, the minor axis, the eccentricity and the length of the latus rectum of the ellipse.

$$\frac{x^2}{36} + \frac{y^2}{16} = 1$$

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2. In each of the Find the coordinates of the foci, the vertices, the length of major axis, the minor axis, the eccentricity and the length of the latus rectum of the ellipse.

$$\frac{x^2}{4} + \frac{y^2}{25} = 1$$

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3. In each of the Find the coordinates of the foci, the vertices, the length of major axis, the minor axis, the eccentricity and the length of the latus

rectum of the ellipse.

$$\frac{x^2}{16} + \frac{y^2}{9} = 1$$

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4. In each of the Find the coordinates of the foci, the vertices, the length of major axis, the minor axis, the eccentricity and the length of the latus rectum of the ellipse.

$$\frac{x^2}{25} + \frac{y^2}{100} = 1$$

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5. In each of the Find the coordinates of the foci, the vertices, the length of major axis, the minor axis, the eccentricity and the length of the latus rectum of the ellipse.

$$\frac{x^2}{49} + \frac{y^2}{36} = 1$$

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6. In each of the Find the coordinates of the foci, the vertices, the length of major axis, the minor axis, the eccentricity and the length of the latus rectum of the ellipse.

$$\frac{x^2}{100} + \frac{y^2}{400} = 1$$

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7. In each of the Find the coordinates of the foci, the vertices, the length of major axis, the minor axis, the eccentricity and the length of the latus rectum of the ellipse.

$$36x^2 + 4y^2 = 144$$

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8. In each of the Find the coordinates of the foci, the vertices, the length of major axis, the minor axis, the eccentricity and the length of the latus rectum of the ellipse.

$$16x^2 + y^2 = 16$$

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9. In each of the Find the coordinates of the foci, the vertices, the length of major axis, the minor axis, the eccentricity and the length of the latus rectum of the ellipse.

$4x^2 + 9y^2 = 36$

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10. In each of the following find the equation fot the ellipse that satisfies the given conditions :

Vertices $(\pm 5, 0)$, foci $(\pm 4, 0)$

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11. In each of the following find the equation fot the ellipse that satisfies the given conditions :

Vertices $(0, \pm 13)$, foci $(0, \pm 5)$

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12. In each of the following find the equation fot the ellipse that satisfies the given conditions :

Vertices $(\pm 6, 0)$, foci $(\pm 4, 0)$

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13. In each of the following find the equation fot the ellipse that satisfies the given conditions :

Ends of major axis $(\pm 3, 0)$, ends of minor axis $(0, \pm 2)$

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14. In each of the following find the equation fot the ellipse that satisfies the given conditions :

Ends of major axis $\left(0, \pm \sqrt{5}\right)$, ends of minor axis $(\pm 1, 0)$

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15. In each of the following find the equation fot the ellipse that satisfies the given conditions :

Length of major axis 26, foci $(\pm 5, 0)$

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16. In each of the following find the equation fot the ellipse that satisfies the given conditions :

Length of minor axis 16, foci $(0, \pm 6)$

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17. In each of the following find the equation fot the ellipse that satisfies the given conditions :

Foci $(\pm 3, 0), a = 4$

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18. In each of the following find the equation fot the ellipse that satisfies the given conditions :

$b = 3, c = 4$, centre at the origin, foci on the x axis.

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19. In each of the following find the equation for the ellipse that satisfies the given conditions :

Centre at $(0, 0)$, major axis on the y-axis and passes through the points $(3, 2)$ and $(1, 6)$.

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20. In each of the following find the equation fot the ellipse that satisfies the given conditions :

Major axis on the x-axis and passes through the points $(4, 3)$ and $(6, 2)$.

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Exercise 11 4

1. Find the area of the region bounded by the ellipse $\frac{x^2}{4} + \frac{y^2}{9} = 1.$

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2. In each of the find the coordinates of the foci and the vertices, the eccentricity and the length of the latus rectum of the hyperbolas.

$\frac{y^2}{9} - \frac{x^2}{27} = 1$

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3. In each of the find the coordinates of the foci and the vertices, the eccentricity and the length of the latus rectum of the hyperbolas.

$9y^2 - 4x^2 = 36$

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4. In each of the find the coordinates of the foci and the vertices, the eccentricity and the length of the latus rectum of the hyperbolas.

$16x^2 - 9y^2 = 576$

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5. In each of the find the coordinates of the foci and the vertices, the eccentricity and the length of the latus rectum of the hyperbolas.

$5y^2 - 9x^2 = 36$

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6. In each of the find the coordinates of the foci and the vertices, the eccentricity and the length of the latus rectum of the hyperbolas.

$49y^2 - 16x^2 = 784$

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7. In each of the find the equations of the hyperbola satisfying the given conditions.

Vertices $(\pm 2, 0)$, foci $(\pm 3, 0)$

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8. In each of the find the equations of the hyperbola satisfying the given conditions.

Vertices $(0, \pm 5)$, foci $(0, \pm 8)$

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9. In each of the find the equations of the hyperbola satisfying the given conditions.

Vertices $(0, \pm 3)$, foci $(0, \pm 5)$

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10. In each of the find the equations of the hyperbola satisfying the given conditions.

Foci $(\pm 5, 0)$, the transverse axis is of length 8.

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11. In each of the find the equations of the hyperbola satisfying the given conditions.

Foci $(0, \pm 13)$, the conjugate axis is of length 24.

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12. In each of the find the equations of the hyperbola satisfying the given conditions.

Foci $\left(\pm 3\sqrt{5}, 0 \right)$, the latus rectum is of length 8.

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13. In each of the find the equations of the hyperbola satisfying the given conditions.

Foci $(\pm 4, 0)$, the latus rectum is of length 12.

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14. In each of the find the equations of the hyperbola satisfying the given conditions.

Vertices $(\pm 7, 0), e = \frac{4}{3}$.

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15. In each of the find the equations of the hyperbola satisfying the given conditions.

Foci $\left(0, \pm \sqrt{10}\right)$, passing through $(2, 3)$

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Miscellaneous Exercise

1. If a parabolic reflector is 20 cm in diameter and 5 cm deep, find the focus.

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2. An arch is in the form of a parabola with its axis vertical. The arch is 10 m high and 5 m wide at the base. How wide is it 2 m from the vertex of the parabola ?

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3. The cable of a uniformly loaded suspension bridge hangs in the form of a parabola . The roadway which is horizontal and 100 m long is supported by vertical wires attached to the cable, the longest wire being 30 m and the shortest being 6m. Find the length of a supporting wire attached to the roadway18 m from the middle.

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4. An arch is in the form of a semi - ellipse. If is 8 m wide and 2 m high at the centre. Find the height of the arch at a point 1.5 m from one end.

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5. A rod of length 12 cm moves with its ends always touching the coordinate axes. Determine the equation of the locus of a point P on the rod, which is 3 cm from the end in contact with the x-axis.

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6. Find 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.

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7. A man running a racecourse notes that the sum of the distances from the two flag posts from him is always 10 m and the distance between the flag posts is 8 m. Find the equation of the posts traced by the man.

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8. An equilateral triangle is inscribed in the parabola $y^2 = 4ax$, where one vertex is at the vertex of the parabola. Find the length of the side of the triangle.

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Textbook Based Mcqs

1. (-3, 2) is one end point of the diameter of circle $x^2 + y^2 - 8x - 4y + 5 = 0$, then the coorinates of the other end point is .....

A. (5, 3)

B. (6, 2)

C. (1, -8)

D. (11. 2)

Answer: D

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2. Area of circle with centre (1,2) and passes from (4,6) is .....

A. 30π

B. 5π

C. 15π

D. 25π

Answer: D

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3. Coordinates of centre of circle passes from (0,0) , (a,0) and (0,b) is .....

A. $\left(\frac{a}{2}, \frac{b}{2}\right)$

B. $\left(\frac{b}{2}, \frac{b}{2}\right)$

C. (b,a)

D. (a, b)

Answer: A

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4. Find the equation of the circle with radius 5 whose centre lies on x-axis and passes through the point $(2, 3)$.

A. $x^2 + y^2 - 12x + 11 = 0$

B. $x^2 + y^2 - 12y + 11 = 0$

C. $x^2 + y^2 - 4x + 12y = 0$

D. $x^2 + y^2 - 4x + 12y = 0$

Answer: A

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5. Find equation of circle whose end points of diameter are centres of the circle $x^2 + y^2 + 6x - 14y - 1 = 0$ and $x^2 + y^2 - 4x + 10y - 2 = 0$.

A. $x^2 + y^2 + x - 2y - 41 = 0$

B. $x^2 + y^2 + x + 2y + 41 = 0$

C. $x^2 + y^2 - x - 2y - 41 = 0$

D. $x^2 + y^2 - x - 2y - 41 = 0$

Answer: A

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6. Coordinates of the centre of the circle given by the equation $\lambda x^2 + (2\lambda - 3)y^2 - 4x + 6y - 1 = 0$ is .....

A. $\left(\frac{4}{3}, 1\right)$

B. $\left(\frac{2}{3}, -1\right)$

C. $\left(-\frac{2}{3}, 1\right)$

D. $\left(\frac{2}{3}, 1\right)$

Answer: B

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7. If the circle $x^2 + y^2 + 2gx + 2fy + c = 0$ does not intersects the X - axis then .....

A. $g^2 < c$

B. $g^2 > c$

C. $g^2 > 2c$

D. None of these

Answer: A

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8. If the circles $x^2 + y^2 = a^2$ and $x^2 + y^2 - 6x - 8y + 9 = 0$ touches each other externally, then a = ...

A. 1

B. -1

C. 21

D. 16

Answer: A

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9. .....of the following is the equation of circle passes from (-1,-2) and concentric to the circle $x^2 + y^2 - 3x + 4y - c = 0$.

A. $x^2 + y^2 - 3x + 4y - 1 = 0$

B. $x^2 + y^2 - 3x + 4y = 0$

C. $x^2 + y^2 - 3x + 4y + 2 = 0$

D. None of these

Answer: B

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10. Point (2, k) is the exterior point of the circles $x^2 + y^2 + x - 2y - 14 = 0$ and $x^2 + y^2 = 13$, then k lies in ..... interval. '

A. $(-3, -2) \cup (3, 4)$

B. `(-3, 4)

C. $(-\infty, -3) \cup (4, \infty)$

D. $(-\infty, -2) \cup (3, \infty)$

Answer: C

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11. $\forall t \in$ R, ...is the point lies on parabola $x^2 = 4ay$.

A. $x = at^2, y = 2at$

B. $x = 2at, y = at^2$

C. $x = 2at^2, y = at$

D. $x = 2at, y = at^2$

Answer: D

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12. Vertex of the parabola $(y-2)^2 = 16(x-1)$ is .....

A. (1, 2)

B. (-1, 2)

C. (1, -2)

D. (2, 1)

Answer: A

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13. Line 2x - 3y + 8 = 0 intersects parabola $y^2 = 8x$ of points P and Q then point of $\overline{PQ}$ is .....

A. (2,4)

B. (8,8)

C. (5,6)

D. (6,5)

Answer: C

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14. Line y = mx + 3 is tangent to parabola $3y^2 = 2x$ then m = ...

A. $-\frac{1}{18}$

B. 18

C. $\frac{1}{18}$

D. None of these

Answer: C

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15. The area of the region bounded by the parabola $y^2 = 4ax$ and its latus rectum is ...Sq. units.

A. 8

B. 4

C. 2

D. 5

Answer: B

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16. Find the equation of a line parallel to X- axis and passing through the origin.

A. $x^2 = 4a(y + a)$

B. $y^2 = 4a(x - a)$

C. $y^2 = -4a(x - a)$

D. `None of these

Answer: A

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17. M is the foot of perpendicular from point P of the parabola $y^2 = 4ax$ to its directrix. Then area of an equilateral triangle SPM is ..... Sq. unit. (Where S is focus of parabola)

A. $4\sqrt{3}a^2$

B. $\frac{\sqrt{3}}{4}a^2$

C. $2\sqrt{3}a^2$

D. $\frac{\sqrt{3}}{2}a^2$

Answer: A

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18. Equation of parabola with focus (-3, 0) and directrix x + 5 = 0 is .....

A. $x^2 = 4(y + 4)$

B. $x^2 = 4(y - 4)$

C. $y^2 = 4(x + 4)$

D. $y^2 = 4(x - 4)$

Answer: C

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19. Focus and directrix of parabola $x^2 = -8ay$ are ....., ... Respectivel.

A. (0, -2a) and y = 2a

B. (0, 2a) and y = -2a

C. (2a, 0) and x = -2a

D. (-2a, 0) and x = 2a

Answer: A

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20. Line l : 2x - 3y + 8 = 0 intersect parabola $y^2 = 8x$ in point P and Q then, coordinates if midpoint of $\overline{PQ}$ .....

A. (5,6)

B. (2, -3)

C. (-3, 5)

D. (-5, -6)

Answer: C

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21. Eccentricity of ellipe $9x^2 + 25y^2 = 225$ is .....

A. $\frac{2}{5}$

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

C. $\frac{3}{5}$

D. 0

Answer: B

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22. If for an ellipse length of minor axis and distance between two focii are equal then its eccentricity e = ...

A. $\frac{1}{\sqrt{2}}$

B. $\frac{\sqrt{2}}{3}$

C. $\frac{\sqrt{3}}{2}$

D. $\frac{2}{\sqrt{3}}$

Answer: A

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23. Length of latus rectum of ellipse $2x^2 + 81y^2 = 162$

A. $\frac{4}{9}$

B. $\frac{9}{4}$

C. $\frac{2}{9}$

D. $\frac{2}{3}$

Answer: A

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24. Length of latus rectum of ellipse $4x^2 + 9y^2 = 1$ is ..... .

A. $\frac{1}{\sqrt{2}}$

B. $\frac{\sqrt{3}}{2}$

C. $\frac{1}{2}$

D. $\sqrt{2}$

Answer: B

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25. Eccentricity of ellipse is .....if length of latus rectum is half then minor axis.

A. $\frac{1}{\sqrt{2}}$

B. $\frac{\sqrt{3}}{2}$

C. $\frac{1}{2}$

D. $\sqrt{2}$

Answer: A

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26. Radius of the circle with centre (0,3) and passes from focus of ellipse $\frac{x^2}{16}+\frac{y^2}{9}=1$ is .....

A. 4

B. 3

C. $\sqrt{12}$

D. $\frac{7}{2}$

Answer: A

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27. .....is the equation of ellipse with eccentricity $e = \frac{2}{3}$. Length of latus rectum is 5 and centre of origin.

A. $\frac{x^2}{81} + \frac{y^2}{45} = 1$

B. $\frac{4x^2}{81} + \frac{4y^2}{45} = 1$

C. $\frac{x^2}{9} + \frac{y^2}{5} = 1$

D. $\frac{x^2}{9} + \frac{y^2}{5} = 1$

Answer: B

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28. Eccentricity of ellipse $\frac{x^2}{169}+\frac{y^2}{25}=1$ and $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$ then $\frac{a}{b}$ = ...

A. $\frac{5}{13}$

B. $\frac{6}{13}$

C. $\frac{13}{5}$

D. $\frac{13}{6}$

Answer: C

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29. If equation $\frac{x^2}{2-r}+\frac{y^2}{r-5}+1=0$ represents ellipse then .....

A. $r>2$

B. $2<r<5$

C. $r>5$

D. None of these

Answer: B

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30. .....of the following is the equation of ellipse with focus (-1, 1) eccentricity $\frac{1}{2}$ and equation of directrix is x - y + 3 = 0.

A. $7x^2 + 2xy + 7y^2 + 10x - 10y + 7 = 0$

B. $7x^2 - 2xy + 7y^2 - 10x + 10y + 7 = 0$

C. $7x^2 - 2xy + 7y^2 - 10x - 10y - 7 = 0$

D. $7x^2 - 2xy + 7y^2 + 10x + 10y - 7 = 0$

Answer: A

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31. If y = mx - 1 is tangent to the hyberbola $\frac{x^2}{16} - \frac{y^2}{9} = 1$ then value of m = ...

A. $-\sqrt{\frac{5}{2}}$

B. $\sqrt{\frac{5}{2}}$

C. $\sqrt{\frac{5}{2}}$

D. $\frac{1}{2}\sqrt{\frac{5}{2}}$

Answer: C

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32. .....of the following is not the eccentricity of hyperbola.

A. $\sqrt{\frac{9}{5}}$

B. $\sqrt{\frac{1}{9}}$

C. $3\sqrt{\frac{1}{8}}$

D. 2

Answer: B

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33. .....is the equation of hyperbola whose distance between two focii is 16 and eccentricity e = $\sqrt{2}$.

A. $x^2 - y^2 = 16.$

B. $x^2 - y^2 = 32$

C. $x^2 - 2y^2 = 16$

D. $y^2 - x^2 = 16$

Answer: B

Watch Video Solution

34. e_1 and e_2 are eccentricities of conies $5x^2 + 9y^2 = 45$ and $5x^2 - 4y^2 = 45$ then $e_1 . e_2$ = ...

A. 9

B. 4

C. 5

D. 1

Answer: D

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35. Co-ordinates of focii of hyperbola $2x^2 - 3y^2 = 5$ is .....

A. $\left(\pm \frac{5}{\sqrt{6}}, 0 \right)$

B. $\left(\pm \frac{5}{6}, 0 \right)$

C. $\left(\pm \frac{\sqrt{5}}{6}, 0 \right)$

D. None of these

Answer: A

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36. Length of transverse axis and conjugate axis in hyperbola are equal then its eccentricity e =.....

A. $\sqrt{3}$

B. $\sqrt{2}$

C. $\frac{1}{\sqrt{2}}$

D. 2

Answer: B

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37. Equation of directrix of Conic $x^2 + 2x - y^2 + 5 = 0$ is .....

A. $x = \pm 1$

B. $x = \pm 2$

C. $y = \pm \sqrt{2}$

D. $y = \pm \sqrt{3}$

Answer: C

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38. P is point on hyperbola $16x^2 - 9y^2 = 144$. S_1 and S_2 are its foci then $PS_1 - PS_2$ = ...

A. 4

B. 6

C. 8

D. 12

Answer: B

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39. Position of the point (3,4) with respect to hyperbola $x^2 - 4y^2 + 24y - 37 = 0$ is .....

A. Inside hyperbola

B. Outside hyperbola

C. On the hyperbola

D. None of these

Answer: B

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40. Length of latus rectum of ellipse $5x^2 + 9y^2 = 45$ is .....

A. $\frac{5\sqrt{5}}{3}$

B. $\frac{5}{3}$

C. $\frac{2\sqrt{5}}{3}$

D. $\frac{10}{3}$

Answer: D

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Latest Exam Mcqs

1. Ortho centre and centroid of any trinangle are A(-3,5) and (3,3) respectively. If C is cirsum centre of this triangle then radius of the circle whose diameter $\overline{AC}$ is .....

A. $\sqrt{10}$

B. $2\sqrt{10}$

C. $3\sqrt{\frac{5}{2}}$

D. $\frac{3\sqrt{5}}{2}$

Answer: C

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2. If tangent to the curve $x^2 = y - 6$ at point (1,7) touches the circle $x^2 + y^2 + 16x + 12y + c = 0$ then value of c is .....

A. 195

B. 185

C. 85

D. 95

Answer: D

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3. Tangent and normal from point P(16, 16) to the parabola $y^2 = 16x$ intersects the axis of parabola of points A and B. If C is the centre of the circle from points P,A and B. Such that $\angle CPB = \theta$ then one possible value of θ is .....

A. $\frac{1}{2}$

B. 2

C. 3

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

Answer: B

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4. Tangent are drawn at points P and Q to the hyperbola $4x^2 - y^2 = 36$. They intersects of point T (0, 3). Then area of ΔPTQ =..... Sq.

A. $45\sqrt{5}$

B. $54\sqrt{3}$

C. $60\sqrt{3}$

D. $36\sqrt{5}$

Answer: A

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Textbook Illustrations For Practice Work

1. Find the equation of the circle with centre at $(0, 0)$ and radius r.

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2. Find the equation of the circle with centre $(-3, 2)$ and radius 4.

Watch Video Solution

3. Find the centre and the radius of the circle $x^2 + y^2 + 8x + 10y - 8 = 0$.

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4. Find the equation of the circle which passes through the point $(2, -2)$, and $(3, 4)$ and whose centre lies on the line$x + y = 2$.

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5. Find the coordinates of the focus , axis, the question of the directrix and latus rectum of the parabola $y^2 = 8x$.

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6. Find the equation of the parabola with focus $(2, 0)$ and directrix $x = -2$.

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7. Find the equation of the parabola with vertex at $(0, 0)$ and focus at $(0, 2)$.

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8. Find the equation of the parabola which is symmetric about y-axis, and passes through the point $(2, -3)$.

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9. Find the coordinates of the foci, the vertices, the length of major axis, the minor axis, the eccentricity and the latus rectum of the ellipse $\frac{x^2}{25}+\frac{y^2}{9}=1$

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10. Find the coordinates of the foci, the vertices, the lengths of major and minor axes and the eccentricity of the ellipse $9x^2+4y^2=36$

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11. Find the equation of the ellipse whose vertices are $(\pm 13, 0)$ and foci are $(\pm 5, 0)$

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12. Find the equation of the ellipse, whose length of the major axis is 20 and foci are $(0, \pm 5)$

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13. Find the equation of the ellipse, with major axis along the x-axis and passing through the points $(4, 3)$ and $(-1, 4)$

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14. Find the corrdinates of the foci and the vertices, the eccentricity, the length of the latus rectum of the hyperbolas :

(i) $\frac{x^2}{9} - \frac{y^2}{16} = 1$ (ii) $y^2 - 16x^2 = 16$

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15. Find the equation of the hyperbola with foci $(0, \pm 3)$ and vertices $\left(0, \pm \frac{\sqrt{11}}{2}\right)$

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16. Find the equation of the hyperbola where foci are $(0, \pm 12)$ and the length of the latus rectum is 36.

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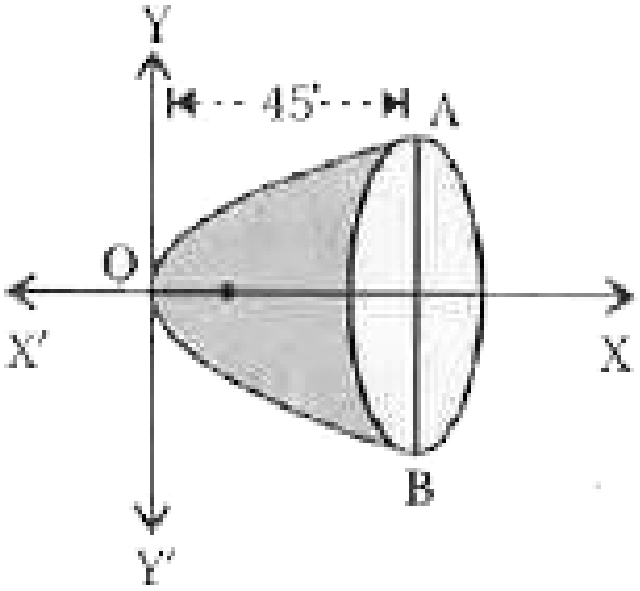
17. The focus of a parabolic mirror as shown in Fig. is at a distance of 5 cm from its vertex. If the mirror is 45 cm deep, find the distance AB.



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18. A beam is supported at its ends by supports which are 12 metres apart. Since tha load is concentrated at its centre, there is a deflection of 3 cm at the centre and the deflected beam is in the shape of a parabola. How far from the centre is the deflection 1 cm ?

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19. A rod AB of length 15 cm rests in between two coordinate axes is such a way that the end point A lies on x-axis and end Point B lies on y-axis. A point P (x,y) is taken on the rod in such a way that $AP = 6cm$. Show that the locus of P is an ellipse.

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Solutions Of Ncert Exemplar Problems Short Answer Type Questions

1. Find the equation of the circle which touches the both axes in first quardrant and whose radius is a.

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2. Show that the point (x,y) given by $x = \frac{2at}{1+t^2}$ and $y = \frac{a(1-t^2)}{1+t^2}$ lies on a circle for all real values of t such that $-1 < t < 1$ where a is any given real numbers.

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3. IF a circle passes through the point (0,0) (a,0),(0,b) then find the coordinates of its centre. Thinking process :

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4. Find the equation of the circle which touches X - axis and whose centre is (1,2).

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5. If the lines $3x - 4y + 4 = 0$ and $6x - 8y - 7 = 0$ are tangents to a circle, then find the radius of the circle.

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6. Find the equation of a circle which touches both the axes and the line 3x - 4y + 8 = 0 and lies in the third quadrant.

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7. If one end a diameter of the circle $x^2 + y^2 - 4x - 6y + 11 = 0$ is (3,4), then find the cordinate of the other end of the diameter.

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8. Find the equation of the circle having (1, -2) as its centre and passing through 3x + y = 14, 2x + 5y = 18.

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9. Find k if line $y = \sqrt{3}x + k$ touches the circle $x^2 + y^2 = 16$.

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10. Find the equation of a circle concentric with the circle $x^2 + y^2 - 6x + 12y + 15 = 0$ and has double of its area.

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11. If the latus rectum of an ellipse is equal of half of minor axis, then find its eccentricity.

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12. Eccentricity of ellipe $9x^2 + 25y^2 = 225$ is .....

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13. If the eccentricity of an ellipse is $\frac{5}{8}$ and ht distance between its foci is 10, then find latus rectum of the ellipse.

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14. .....is the equation of ellipse with eccentricity $e = \frac{2}{3}$. Length of latus rectum is 5 and centre of origin.

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15. Find the distance between the directrices of th ellipse $\frac{x^2}{36} + \frac{y^2}{20} = 1$.

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16. Find the co-ordinates of a point on the parabola $y^2 = 8x$ whose focal distance is 4.

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17. Find the length of the line-segment joining the vertex of the parabola $y^2 = 4ax$ and a point on the parabola where the line - segment makes an

angle θ to the X - axis.

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18. If the point (0,4) and (0,2) are respectively the vertex and focus of a parabola, then find the equation of the parabola.

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19. If the line y = mx + 1 is tangent to the parabola $y^2 = 4x$ then find the value of m.

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20. If the distance between the foci of a hyperbola is 16 and its eccentricity is $\sqrt{2}$, then obtain the equation of the hyperbola.

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21. Find the eccentricity of the hyperbola $9y^2 - 4x^2 = 36$.

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

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Solutions Of Ncert Exemplar Problems Long Answer Type Questions

1. If the lines 2x - 3y = 5 and 3x - 4y = 7 are the diameters of a circle of area 154 square units, then obtain the equation of the circle.

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2. Find equation of the circle passes through points (2,3) and (4,5) whose centre lies on the line y - 4x + 3 = 0.

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3. Find the equation of a circle whose centre is (3, -1) and which cuts off a chord of length 6 units on the line 2x - 5y + 18 = 0.

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4. Find the equation of a circle of radius 5 which is touching another circle $x^2 + y^2 - 2x - 4y - 20 = 0$ at (5,5).

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5. Find the equation of a circle passing through the point (7,3) having radius 3 units and whose centre lies on the line y = x -1.

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6. Find the equation of each of the following parabolas :

(i) Directrix x = 0, focus at (6, 0)

(ii) Vertex at (0,4), focus at (0,2)

(iii) Focus at (-1, -2), directrix x - 2y + 3 = 0.

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7. Find the equation of the set of al points the sum of whose distance from the points (3,0) and (9,0) is 12.

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8. Find the equation of the set of all points whose distance from (0,4) are $\frac{2}{3}$ of their distance from the line y = 9.

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9. Show that the set of all points such that the difference of their distances from (4,0) and (-4, 0) is always equal to 2 represent a hyperbola.

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10. Find the equation of the hyperbola with ,

(i) Vertices $(\pm 5, 0)$, foci $(\pm 7, 0)$

(ii) Vertices $(0, \pm 7)$, $e = \frac{4}{3}$

(iii) Foci $(0 \pm \sqrt{10})$, passing through (2,3)

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Solutions Of Ncert Exemplar Problems True False

1. The line x + 3y = 0 is a diameter of the circle $x^2 + y^2 + 6x + 2y = 0$.

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2. The shortest distance from the point (2,-7) to the circle $x^2 + y^2 - 14x - 10y - 151 = 0$ is equal to 5.

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3. If the line lx + my = 1 is a tangent to the circle $x^2 + y^2 = a^2$, then the point (l,m) lies on a circle.

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4. The point (1,2) lies inside the circle $x^2 + y^2 - 2x + 6y + 1 = 0$.

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5. The line lx + my + n = 0 will touch the parabola $y^2 = 4ax$ if $am^2 = nl$.

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6. If P is a point on the ellipse $\frac{x^2}{16} + \frac{y^2}{25} = 1$ whose foci are S and S', then PS + PS' = 8.

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7. The line 2x + 3y = 12 touches the ellipse $\frac{x^2}{9} + \frac{y^2}{4} = 2$ at the point (3, 2).

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8. The locus of the point of intersection of the $\sqrt{3}x - y - 4\sqrt{3}k = 0$ and $\sqrt{3}kx + ky - 4\sqrt{3} = 0$ for different value of k is a hyperbola whose eccentricity is 2.

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Solutions Of Ncert Exemplar Problems Fillers

1. The equation of the circle having centre at (3, -4) and touching te line $5x + 12y - 12 = 0$ is .....

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2. The equation of the circle circumscribing the triangle whose sides are the lines $y = x + 2$, $3y = 4x$ and $2y = 3x$ is .....

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3. An ellipse is desrcibed by using an endless string which is passed over two pins. If the axes are 6 cm and 4 cm, the leght of the string and distance between the pins are .....

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4. The equation of the ellipse having foci (0,1), (0,-1) and minor axis of length 1 is .....

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5. The equation of the parabola having focus at (-1, -2) and the directrix x - 2y + 3 = 0 is .....

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6. The equation of the hyperbola which vertices at $(0, \pm 6)$ and eccenntricity $\frac{5}{3}$ is ..... and its foci are ..... .

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Solutions Of Ncert Exemplar Problems Objective Type Questions

1. Area of circle with centre (1,2) and passes from (4,6) is .....

A. 5π

B. 10π

C. 25π

D. None of these

Answer: C

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2. Find the equation of a line which passes through the point $(2, 3, 4)$ and which has equal intercepts on the axes.

A. $x^2 + y^2 + 6x + 6y + 3 = 0$

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

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

D. None of these

Answer: C

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3. Equation of the circle with centre on the Y - axis and passing through the origin and the point (2,3) is .....

A. $x^2 + y^2 + 13y = 0$

B. $3x^2 + 3y^2 + 13x + 3 = 0$

C. $6x^2 + 6y^2 - 13y = 0$

D. $x^2 + y^2 + 13x + 3 = 0$

Answer: C

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4. The equation of a circle with origin as centre and passing through the vertices of an equilateral triangle whose median is of length 3a is .....

A. $x^2 + y^2 = 9a^2$

B. $x^2 + y^2 = 16a^2$

C. $x^2 + y^2 = 4a^2$

D. $x^2 + y^2 = a^2$

Answer: C

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

A. $x^2 = -12y$

B. $x^2 = 12y$

C. $y^2 = -12x$

D. $y^2 = 12x$

Answer: A

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6. 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

Answer: B

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7. If the vertex of the parabola is the point (-3, 0) and the directrix is the line x + 5 = 0, then its equation is .....

A. $y^2 = 8(x + 3)$

B. $(x^2 = 8(y + 3)$

C. $(y^2 = -8(x + 3)$

D. $y^2 = 8(x + 5)$

Answer: A

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8. The equation of the ellipse whose focus is (1, -1) the direxitrix the line x - y - 3 = 0 and eccentricity $\frac{1}{2}$ is .....

A. $7x^2 + 2xy + 7y^2 - 10x + 10y + 7 = 0$

B. $7x^2 + 2xy + 7y^2 + 7 = 0$

C. $7x^2 + 2xy + 7y^2 + 10x - 10y - 7 = 0$

D. None of these

Answer: A

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9. The length of the latus rectum of the ellipse $3x^2 + y^2 = 12$ is .....

A. 4

B. 3

C. 8

D. $\frac{4}{\sqrt{3}}$

Answer: D

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10. If e is the eccentricity of the ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1(a < b)$, then .....

A. $b^2 = a^2(1 - e^2)$

B. $a^2 = b^2(1 - e^2)$

C. $a^2 = b^2(e^2 - 1)$

D. $b^2 = a^2(e^2 - 1)$

Answer: B

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11. 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

Answer: C

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12. .....is the equation of hyperbola whose distance between two focii is 16 and eccentricity e = $\sqrt{2}$.

A. $x^2 - y^2 = 32$

B. $\frac{x^2}{4} - \frac{y^2}{9} = 1$

C. $2x - 3y^2 = 7$

D. None of these

Answer: A

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

A. $\frac{x^2}{4} - \frac{y^2}{5} = \frac{4}{5}$

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

Answer: A

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Question Of Module

1. Obtain the equation oc circle with centre (3,-2) and radius $\sqrt{5}$ unit.

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2. Obtain centre and radius of the circle given by $x^2 + y^2 + 6x + 8y - 75 = 0.$

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3. Find coordinates of focus, axis of parabola equation of directrix and length of latus rectum of parabola $x^2 = 16y.$

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4. Obtain equation of parabola with vertex (0,0) and focus (5,0)

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5. Find foci, equation of directrix, length of major axis and minor axis of ellips $\frac{x^2}{36} + \frac{y^2}{144} = 1.$

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6. Find the equation of the ellipse whose vertices are $(\pm 13, 0)$ and foci are $(\pm 5, 0)$

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7. Find eccentricity, coordinates of foci and equation of directrix of the hyperbola $\frac{y^2}{49} - \frac{x^2}{4} = 1.$

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8. Curve having eccentricity $\sqrt{2}$ is a rectangular hyperbola.

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9. Find focus, direxrix and length of latus rectem of $3y^2 - 2x^2 = 1$.

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