



# MATHS

## NCERT - NCERT

## MATHEMATICS(TELUGU)

## CONIC SECTIONS

### Example

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.



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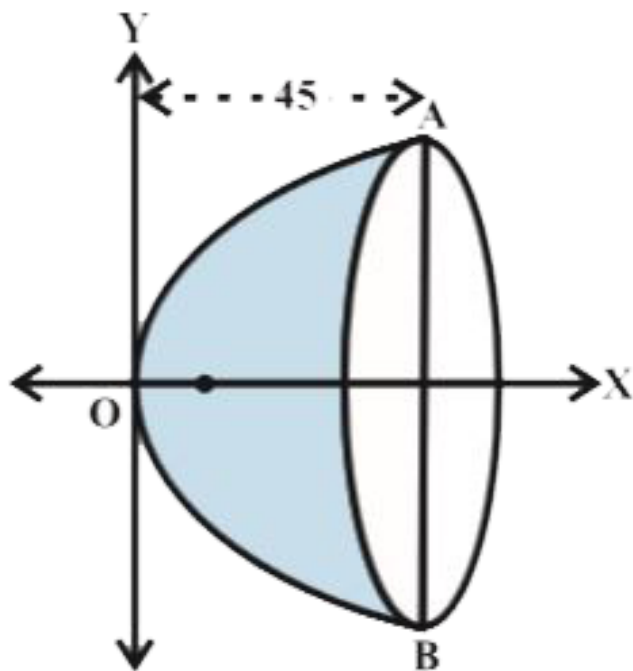
**16.** Find the equation of the hyperbola where foci are  $(0, \pm 12)$  and the length of the latus rectum is 36.



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**17.** The focus of a parabolic mirror as shown in Fig 11.33 is at a distance of 5 cm from its vertex. If the mirror is 45 cm deep, find the

distance AB (*Fig11.33*).



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**18.** A beam is supported at its ends by supports which are 12 metres apart. Since the

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 in 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  $AP = 6\text{cm}$  . Show that the locus of P is an ellipse.



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## Exercise 11 1

1. In each of the following find the equation of the circle with  
centre  $(0, 2)$  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 find 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. Find the centre and radius of the 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 product of the following pairs

$$8x^4yz, 8x^2y^3$$



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**12.** Find the product of the following pairs

$$22p^3q, 4p^2q^2$$



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**13.** Find the product of the following pairs

$$4x^3y, 7y^2z$$



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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.** Find the product of the following pairs

$$7a^4, 10b^2c^2$$



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**Exercise 11 2**

1. Find the product of the following pairs

$$4p^2qr^3, 9p^2q$$



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2. Express each of the following decimals in

the  $\frac{p}{q}$  form

$$0.345$$



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3. Express each of the following decimals in the  $\frac{p}{q}$  form

12.45



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4. Express each of the following decimals in the  $\frac{p}{q}$  form

9.75



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5. Express each of the following decimals in the  $\frac{p}{q}$  form

8.12



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6. Express each of the following decimals in the  $\frac{p}{q}$  form

7.15



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7. Express each of the following decimals in the  $\frac{p}{q}$  form

12.05



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8. Express each of the following decimals in the  $\frac{p}{q}$  form

10.234



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9. Express each of the following decimals in the  $\frac{p}{q}$  form

87.5



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10. Express each of the following decimals in the  $\frac{p}{q}$  form

0.355



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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. Express each of the following decimals in the  $\frac{p}{q}$  form

7.2



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## Exercise 11 3

1. Express each of the following decimals in the

$\frac{p}{q}$  form

4.56



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2. Express each of the following decimals in

the  $\frac{p}{q}$  form

2.55



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3. Express each of the following decimals in the  $\frac{p}{q}$  form

5.45



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4. Express each of the following decimals in the  $\frac{p}{q}$  form

13.45



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5. Express each of the following decimals in the  $\frac{p}{q}$  form

9.42



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6. Express each of the following decimals in  $\frac{p}{q}$  form

44.05



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7. Express each of the following decimals in  $\frac{p}{q}$  form

87.15



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8. Express each of the following decimals in the  $\frac{p}{q}$  form

33.05



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**9.** Express each of the following decimals in the  $\frac{p}{q}$  form

11.15



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**10.** Express each of the following decimals in the  $\frac{p}{q}$  form

75.5



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11. Express each of the following decimals in the  $\frac{p}{q}$  form

3.12



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



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



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**15.** Express each of the following decimals in the  $\frac{p}{q}$  form

4.16



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**16.** Express each of the following decimals in the  $\frac{p}{q}$  form

20.2



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**17.** Express each of the following decimals in the  $\frac{p}{q}$  form

12.24



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**18.** Express each of the following decimals in the  $\frac{p}{q}$  form

13.26



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**19.** Express each of the following decimals in the  $\frac{p}{q}$  form

15.30



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**20.** In each of the following find the equation for 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.** Express each of the following decimals in the  $\frac{p}{q}$  form

5.75



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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. Express each of the following decimals in the  $\frac{p}{q}$  form

2.12



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**8.** Express each of the following decimals in the  $\frac{p}{q}$  form

11.50



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**9.** Express each of the following decimals in the  $\frac{p}{q}$  form

4.32



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10. Express each of the following decimals in the  $\frac{p}{q}$  form

9.22



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11. Express each of the following decimals in the  $\frac{p}{q}$  form

10.5



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

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



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13. Express each of the following decimals in the  $\frac{p}{q}$  form

7.48



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**14.** Express each of the following decimals in the  $\frac{p}{q}$  form

0.010



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

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



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## Miscellaneous Exercise

1. Express each of the following decimals in the

$\frac{p}{q}$  form

7.55



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2. Express each of the following decimals in

the  $\frac{p}{q}$  form

6.42



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3. Express each of the following decimals in the  $\frac{p}{q}$  form

5.125



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4. Express each of the following decimals in the  $\frac{p}{q}$  form

12.345



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5. Express each of the following decimals in the  $\frac{p}{q}$  form

7.35



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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. Express each of the following decimals in the  $\frac{p}{q}$  form

0.002



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8. Express each of the following decimals in the  $\frac{p}{q}$  form

66.6



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