MATHS

BOOKS - NCERT MATHS (HINGLISH)

CONIC SECTIONS

Short Answer

1. Find the equation of the circle which touches the both axes in first quadrant 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 $y = \left(\frac{1-t^2}{1+t^2}\right)$ lies on a circle for all real values of t such that $-1 \leq t \leq 1$, where a is any given real number.

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3. If a circle passes through the points $(0, 0), (a, 0)$ and $(0, b)$, then find the coordinates of its centre.

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

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

C. (a, b)

D. none of these

Answer: A

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4. Find the equation of the circle which touches the x - axis and whose center is $(1, 2)$.

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

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

C. $x^2 - y^2 + 4x - 6y + 5 = 0$

D. none of these

Answer: A

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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 the circle which touches both the axes and the line $3x - 4y + 8 = 0$ and lies in the third quadrant.

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

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

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

D. none of these

Answer: B

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7. If one end of a diameter of the circle $x^2 + y^2 - 4x - 6y + 11 = 0$ is $(3, 4)$, then find the coordinates 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 the intersection of the lines $3x + y = 14$ and $2x + 5y = 18$.

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9. If the line $y = \sqrt{3} + k$ touches the circle $x^2 + y^2 = 16$, then find the value of k.

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10. The equation of circle concentric with circle $x^2 + y^2 - 6x + 12y + 15 = 0$ and double its area is

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

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12. Find the eccentricity coordinates of foci length of the latus rectum of the following ellipse: $9x^2 + 2y^2 = 225$

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

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14. Find the equation of an ellipse whose eccentricity is $\frac{2}{3}$, the latus rectum is 5 and the centre is at the origin.

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

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16. Find the coordinates of points 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 make and angle θ to the x- axis.

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18. If the points $(0, 4) and (0, 2)$ 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 its equation.

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

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

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Long Answer

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

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

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

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5. Find the equation of the 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 parabola

focus at $(-1, 2)$ directrix $x - 2y + 3 = 0$

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

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9. Show that the set all points such that the difference of their distances from

$(4, 0) and (-4, 0)$ is always equal to 2

represents a hyperbola.

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10. Find the equation of the hyperbola with

vertices ($\pm$ 5,0), foci ($\pm$ 7,0).

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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 circle $x^2 + y^2 - 14x - 10y - 151 = 0$

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3. If the line $lx + my - 1 = 0$ touches the circle $x^2 + y^2 = a^2$, then prove that (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. If the line $lx + my + n = 0$ touches the parabola $y^2 = 4ax$, prove that $\ln = am^2$

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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 points (3,2).

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8. The locus of the point of intersection of lines $\sqrt{3}x-y-4\sqrt{3k}$=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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Fillers

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

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2. Find the equation of the circle which circumscribes the triangle formed by the line:

$y = x + 2, 3y = 4x \; and \; 2y = 3x$

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

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

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5. Find the equation of the parabola whose focus is at $(-1, -2)$ and the directrix the line $x - 2y + 3 = 0$

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

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Objective Type

1. The area of the circle centred at $(1, 2)$ and passing through $(4, 6)$ is

A. 5π

B. 10π

C. 25π

D. none of these

Answer: C

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2. Equation of a circle which passes through $(3, 6)$ and touches the axes is

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 $(2, 3)$ 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. Find the equation of a circle with origin as centre and which circumscribes equilateral triangle whose median of length $3a$

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 find the length of its latus rectum.

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 a parabola is the point $(-3, 0)$ and the directrix is the line $x + 5 = 0$, then find its equation.

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. If question of the ellipse whose focus is $(1, -1)$, then directrix 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 latusrectum 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 eccentricity of the ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$(where,a $<$ b), then

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

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

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

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

Answer: B

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11. The eccentricity of the hyperbola whose length of the latus rectum is equal to 8 and the length of its conjugate axis is equal to half of the distance between its 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. The distance between the foci of a hyperbola is 16 and its eccentricity is $\sqrt{2}$ then equation of the hyperbola is

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

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

D. none of these

Answer: A

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