MATHS

BOOKS - OMEGA PUBLICATION

CONIC SECTIONS

Questions

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1. Find the equation of the circle with

Centre (-2,3) and radius 4

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2. Find the equation of the circle with

Centre (-a,b) and radius $\sqrt{a^2 - b^2}$

3. In each of the following circles, find the centre and radius.

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

4. In each of the following circles, find the centre and radius.

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

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5. In each of the following circles, find the centre and radius.

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

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

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

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

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

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

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

$$y^2 = 12x$$

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

$$y^2 = -8x$$

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

latus rectum .

$$x^2 = 6y$$

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

$$x^2 = -9y$$

15. Find the equation of the parabola that satisfies given conditions :

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

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16. Find the equation of the parabola that satisfies given conditions :

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

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17. Find the equation of the parabola that satisfies given conditions :

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

18. Find the equation of the parabola that satisfy the given conditions: Vertex (0,0), passing through (5, 2) and symmetric with respect to y-axis.

19. 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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20. 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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21. 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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22. 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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23. Find the equation for ellipse that satisfies the given conditions

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

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24. Find the equation for ellipse that satisfies the given conditions

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

25. Find the eqation for the ellipse that satisfies the given conditions :

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

26. Find the eqation for the ellipse that satisfies the given conditions :

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

27. Find the equation for the ellipse that satisfies the given condition :

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

28. Find the equation for the ellipse that satisfies the given condition :

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

29. Find the coordinates of the foci and the vertices, the ecentricity and the length of the

latus rectum of the hyperbolas :

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

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30. Find the coordinates of the foci and the vertices, the ecentricity and the length of the latus rectum of the hyperbolas :

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

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31. Find the equations of the hyperbola satisfying the given conditions.

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

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32. Find the equations of the hyperbola satisfying the given conditions.

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

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33. 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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34. 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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35. Find the equation of the hyperbola satisfying the given conditions. Foci $\left(\pm 3\sqrt{5}, 0 \right)$ the latus rectum is of length 8.

36. Find the equation of hyperbola satisfying the given conditions.

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

1. If a parabolic reflector is 20 cm in diameter and 5 cm deep. Find the fous.

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2. An arch is in the form of a parabola with its axis vertical. The arch is 10m high and 5m wide

at the base. How wide is it 2m from the vertex

of the parabola ?

3. 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.

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

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1. The vertex of the parabola $y^2 = 4ax$ is

A. (0,0)

B. (-9,0)

C. (9,0)

D. none of these

Answer: A

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2. Consider the equation of a parabola $y^2 + 4ax = 0$ where, $a > 0$. Which of the following is false ?

A. Vertex of the parabola is at the origin

B. Focus of the parabola is at (a, 0)

C. Directrix of the parabola is x = a

D. Tangents at the vertex is x = 0

Answer: B

3. The focus of the parabola $y = 2x^2 + x$ is

A. (0,0)

B. $\left(\dfrac{1}{2}, \dfrac{1}{4} \right)$

C. $\left(\dfrac{1}{-4}, 0 \right)$

D. none of these

Answer: D

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4. The equation of the parabola with the focus

(3,0) and directrix x+3=0 is

A. $y^2 = 3x$

B. $y^2 = 2x$

C. $y^2 = 12x$

D. $y^2 = 6x$

Answer: C

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5. The equation of the parabola with focus at

(0, 3) and the directrix y + 3 = 0 is

A. $x^2 = -12y$

B. $x^2 = 12y$

C. $y^2 = -12x$

D. $y^2 = 12x$

Answer: B

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

A. $\dfrac{2}{3}$

B. $\dfrac{4}{3}$

C. $\dfrac{1}{3}$

D. 4

Answer: B

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7. The locus of a point which moves so that its distance from a fixed point, called focus, bears a constant ratio, which is less than unity, to its

distance from a fixed line, called the directrix, is called

A. a parabola

B. a hyperbola

C. an ellipse

D. a circle

Answer: C

8. The foci of the ellipse $9x^2 + 4y^2 = 36$ are

A. $(-5, 0)$

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

C. $(\pm 5, 0)$

D. $(0, -5)$

Answer: B

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9. If the latus rectum of an ellipse is one half of its minor-axis, then its. eccentricity is

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

B. $\dfrac{1}{\sqrt{2}}$

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

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

Answer: C

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

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

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

C. $\dfrac{1}{3}$

D. $\dfrac{1}{5}$

Answer: B

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11. The foci of the hyperbola $9x^2 - 16y^2 = 144$ are

    A. $(\pm 4, 0)$

    B. $(0, \pm 4)$

    C. $(\pm 5, 0)$

    D. $(0, \pm 5)$

Answer: C

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12. If P (x,y) , $F_1(3, 0)$ and $F_2(-3, 0)$ and $16x^2 + 25y^2 = 400$, then $PF_1 + PF_2$ equals

A. 8

B. 6

C. 10

D. 12

Answer: C

13. If the major axis of an ellipse is thrice the minor axis, then its eccentricity is equal to

A. $\dfrac{1}{3}$

B. $\dfrac{1}{\sqrt{3}}$

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

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

Answer: D

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14. The latus rectum of the hyperbola $16x^2 - 9y^2 = 144$ is

A. $\dfrac{16}{3}$

B. $\dfrac{32}{3}$

C. $\dfrac{8}{3}$

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

Answer: B

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

A. 5π sq. units

B. 15π sq. units

C. 25π sq. units

D. 30π sq. units

Answer: C

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16. The equation of a circle with centre at (1,0)

and circumference 10π units is

A. $x^2 + y^2 - 2x + 24 = 0$

B. $x^2 + y^2 - x - 25 = 0$

C. $x^2 + y^2 - 2x - 24 = 0$

D. $x^2 + y^2 - 2y + 24 = 0$

Answer: A

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17. The equation of the circle whose centre is (0, 0) and which passes through the point (4,-5) is

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

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

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

D. $x^2 + y^2 = 7$

Answer: A

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18. The ends of diameter of a circle are (2, 3) , (6,5). The centre of the circle is

    A. (3,0)

    B. (8,8)

    C. (4,4)

    D. (2,2)

Answer: C

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19. The centre and radius of the circle $x^2 + (y - 1)^2 = 2$ are

A. $(1, 0), \sqrt{3}$

B. $(0, 1), \sqrt{2}$

C. $(0, 2), \sqrt{2}$

D. none of these

Answer: B

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20. The eccentricity 'e' of a parabola is

A. < 1

B. > 1

C. $= 1$

D. 0

Answer: B

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21. The equation of the directrix of the parabola $x^2 = -4ay$ is

A. $x + a = 0$

B. $x - a = 0$

C. $y + a = 0$

D. $y - a = 0$

Answer: C

22. The length of the latus rectum of the hyperbola $\dfrac{x^2}{a^2} - \dfrac{y^2}{b^2} = 1$ is

A. $\dfrac{2a^2}{b}$

B. $\dfrac{2b^2}{a}$

C. $\dfrac{b^2}{a}$

D. $\dfrac{a^2}{b}$

Answer: D

23. If e is the eccentricity of the ellipse $\dfrac{x^2}{a^2} + \dfrac{y^2}{b^2} = 1(a < b)$, 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: A

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24. The latus rectum of the ellipse $5x^2 + 9y^2 = 45$ is

A. $\dfrac{10}{3}$

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

C. $\dfrac{5\sqrt{5}}{3}$

D. $\dfrac{10\sqrt{5}}{3}$

Answer: B

25. If (x, 4) and (2, 8) are the extremities of a diameter of circle with.centre.at (4, y) then the value of x and y are

    A. $x = 6$, $y = 2$

    B. $x = 6$, $y = 5$

    C. $x = 6$, $y = 3$

    D. $x = 6$, $y = 6$

Answer: D

26. For the ellipse $\dfrac{x^2}{1} + \dfrac{y^2}{4} = 1$ the latus rectum

    A. $1/2$

    B. 1

    C. 2

    D. 4

Answer: B