MATHS

BOOKS - SURA MATHS (TAMIL ENGLISH)

TWO DIMENSIONAL ANALYTICAL GEOMETRY - II

Exercise 5 1

1. Obtain the equation of the circles with radius 5 cm and touching x-axis at the origin in general form.

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2. Find the equation of the circlue with centre (2,-1) and passing through the point (3,6) in standard form.

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3. Find the equation of circles that touch both the axes and pass through (-4,-2) in general form.

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4. find the equation of the circle with centre (2,3) and passing through the intersection of the lines 3x -2y -1=0 and 4x + y -27 =0 ..

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5. Obtain the equation of the circle for which (3,4) and (2,-7) are the ends of a diameter.

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6. Find the equation of the circle through the points (1 ,0), (-1,0) and (0,1)

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7. A circle of area 9π square units has two of its diameters along the lines x + y =5 and x-y =1

. Find the equation of the circle.

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8. If $y = 2\sqrt{2}x + c$ is a tangent to the circle $x^2 + y^2 = 16$, find the value of c.

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9. Find the equation of the tengent and normal to the circle $x^2 + y^2 - 6x + 6y - 8 = 0at(2, 2)$

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10. Determine whether the points (-2,1) ,(0,0) and (-4,-3) lie outside, on or inside the circle $x^2 + y^2 - 5x + 2y - 5 = 0$

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11. Find centre and radius of the following circles.

(i) $x^2 + (y + 2)^2 = 0$

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

(iii) $x^2 + y^2 - x + 2y - 3 = 0$

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

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12. If the equation $3x^2 + (3 - p)xy + qy^2 - 2px = 8pq$ represents a circle, find p and q. Also determine the centre and radius of the centre.

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Exercise 5 2

1. Find the equation of the parabola in each of the case given below :

(i) Focus (4,0) and direction x = -4.

(ii) passes through (2,-3) and symmetric about y-axis.

(iii) vertex (1,-2) and forus (4,-2)

(iv) end points of latus rectun (4,-8) and (4,8)

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2. Find the equation of the ellipse in each of the cases given below :

(i) foci $(-+3, 0), e = \frac{1}{2}$

(ii) foci $(0, -+4)$ and end points of major axis are $(0 -+5)$

(iii) length of lagtus rectum 8, eccentricity $= \frac{3}{5}$ and major axis on x-axis .

(iv) length of latus rectum 4, distance between foci $4\sqrt{2}$ and major axis as y -axis.

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3. Find the equation of the hyperbola in each of the cases given below :

(i) foci $(- \ + 2, 0)$ eccentricity = $\frac{3}{2}$

(ii) Centre (2, 1) one of the foci (8,1) and corresponding directrix x = 4.

(iii) Passing through (5,-2) and length of the transverse axis along x axis and of length 8 units.

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4. Find the vertex ,focus , equation of directrix , and length of latus rectam of the following :

$(i) y^2 = 16x$ (ii) $x^2 = 24y$

(iii) $y^2 = -8x$ (iv) $x^2 - 2x + 8y + 17 = 0$

(v) $y^2 - 4y - 8x + 12 = 0$

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5. Identify the type of conic and find centre, foci, vertices and directries of each of the following :

$\frac{x^2}{25} + \frac{y^2}{9} = 1$

(ii) $\frac{x^2}{3} + \frac{y^2}{10} = 1$

(iii) $\frac{x^2}{25} - \frac{y^2}{144} = 1$

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

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6. Prove that the length of the latusrection of the hyperbola $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$ is $\frac{2b^2}{a}$

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7. show that the absolute value of the focal distances of any point P on the hyperbola in the length of its transverse axis.

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8. Identify the type of conic and find centre, foci, vertices, and directices of each of the following:

$$\frac{(x+3)^2}{225} - \frac{(y-4)^2}{64} = 1$$

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Exercise 5 3

1. Identify the type of conic section for each of the equations

1. $2x^2 - y^2 = 7$
2. $3x^2 + 3y^2 - 4x + 3y + 10 = 0$
3. $3x^2 + 2y^2 = 14$
4. $x^2 + y^2 + x - y = 0$
5. $11x^2 - 25y^2 - 44x + 50y - 256 = 0$
6. $y^2 + 4x + 3y + 4 = 0$

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Exercise 5 4

1. Find the equations of the two tangents that can be drawn from (5,2) to the ellispse $2x^2 + 7y^2 = 14$

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2. Find the equations of tangents to the hyperbola $\frac{x^2}{16} - \frac{y^2}{64} = 1$ which are parallelto $10x - 3y + 9 = 0$

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3. Show that the line x-y + 4 =0 is a tangents to the ellipse $x^2 + 3y^2 = 12$. Also find the coordinates of the points of contact.

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4. Find the equation of th tangen to the parabola $y^2 = 16x$ perpendicular to $2x + 2y + 3 = 0$

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5. Find the equation of the tangent at t =2 to the parabola $y^2 = 8x$.

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6. Find the equations of the tangent and normal to hyperbola $12x^2 - 9y^2 = 108 \ \text{at} \theta = \frac{\pi}{3}$.

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7. Prove that the point of intersection of the tangents at t_1 and t_2 on the parabola $y^2 = 4ax$ is (at1t2,a(t1+t2))

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8. if the normal at the point t_1 on the parabola $y^2 = 4ax$ meets the parabola again in the point t_2 then prove that $t_2 = -\left(t_1 + \frac{2}{t_1}\right)$

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Exercise 5 5

1. A bridge has a parabolic arch that is 10 m high in the centre and 30 m wide at the bottom. Find the height of the arch 6m from the centre, on either sides.

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2. A tunnel through a mountain for a four lane highway is to have a elliptical opening. The total width of the highway (not the opening)

is to be 16m , and the height at the edge of the road must be sufficient for a truck 4m high to clear if the highest point of the opening is to be 5m approximately. How wide must the opening be ?

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3. At a water fountain , water attains a maximum height of 4m at horizontal distance of 0.5 m from its origin. If the path of water is a parabola, find the height of water at a

horizontal distance of 0.75 m from the point or origin.

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4. An engineer designs a satellite dish with a parabolic cross section . The dish is 5m wide at the opening, and the focus is placed 1.2 m from the vertex.

(a) Position a coordinate system with the origin at the vertex and the x-axis on the parabola 's axis of symmetry and find an

equation of the parabola.

(b) find the depth of the satellite dish at the vertex.

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5. Parabolic cable of a 60m portion of the roadbed of a suspension bridge are positioned as shown below. Vertical Cables are to be spaced every 6m along this portion of the roadbed. Calculate the lengths of first two of these vertical cables from the vertex.

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6. Cross section of a Nuclear cooling towar is in the shape of a hyperbola with equation $\frac{x^2}{30^2} - \frac{y^2}{44^2} = 1$. The towar is 150 m tall and the distance from the top of the towar to the centre of the hyperbola is half the distance from the base of the towar to the centre of the hyperbola. Find the diameter of the top and base of the tower.

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7. A rod of length 1.2 m moves with its ends always touching the coordinate axes. The locus of a point Pon the rod, which is 0.3 m from the end in contact with x-axis is an ellipse. Find the eccentricity.

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8. Assume that water issuing from the end of a horizontal pipe. 7.5 m above the ground describes a parabolic path. The vertex of the

parabolic path . The vertex of the parabolic path is at the end of the pipe. At a position 2.5 m below the line of the pipe . At a position 2.5 m below the line of the pipe , the flow of water has curved outward 3m beyond the vertical line through the end of the pipe. How far beyond this vertical line will the water strike the ground ?

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9. On lighting a rocket cracker it gets projected in a parabolic path and reaches a maximum height of 4m when it is 6 m away from the point of projection. Finally it reaches the ground 12 m away from the starting point. Find the angle of projection.

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10. Points A and B are 10 km apart and it is determined from the sound of an explosion

heard at those points at different times that the location of the explosion is 6 km closer to A than B. Show that the location of the explosion is restricted to a particular curve and find an equation of it.

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Exercise 5 6

1. The equation of the circle passing through (1,5) and (4,1) and touching y-axis is

$x^2 + y^2 - 5x - 6y + 9 + \lambda(4x + 3y - 19) = 0$

where λ is equal to

A. $0, -\frac{40}{9}$

B. 0

C. $\frac{40}{9}$

D. $\frac{-40}{9}$

Answer: A

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

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

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

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

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

Answer: C

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3. The circle $x^2 + y^2 = 4x + 8y + 5$ intersects the line 3x -4y =m at two distinct points if

A. $15 < m < 65$

B. $35 < m < 85$

C. $-85 < m < -35$

D. $-35 < m > 15$

Answer: D

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4. The length of the diameter of the circle which touches the x-axis at the point (1,0) and passes through the point (2,3)

A. $\frac{6}{5}$

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

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

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

Answer: C

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5. The radius of the circle

$$3x^2 + by^2 + 4bx - 6by + b^2 = 0$$

A. 1

B. 3

C. $\sqrt{10}$

D. $\sqrt{11}$

Answer: C

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6. The centre of the circle inscribed in a square formed by the lines $x^2 - 8x + 12 = 0$ and $y^2 - 14 + 45 = 0$ is

A. (4,7)

B. (7,4)

C. (9,4)

D. (4,9)

Answer: A

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7. The equation of the normal to the circle $x^2 + y^2 - 2x - 2y + 1 = 0$ which is parallel to the lines 2x + 4y =3 is

A. x + 2y = 3

B. x + 2y + 3 =0

C. 2x + 4y + 3=0

D. x -2y + 3=0

Answer: A

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8. If P (x,y) be any point on $16x^2 + 25y^2 = 400$ with foci $F_1(3, 0)$ and $F_2(-3, 0)$ then $PF_1 + PF_2$ is

A. 8

B. 6

C. 10

D. 12

Answer: C

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9. The radius of the circle passing through the point (6,2) two of whose diameter are x+y =6 and x + 2y =4 is

A. 10

B. $2\sqrt{5}$

C. 6

D. 4

Answer: B

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10. The area of quardrilateral formed with foci of the hyperbolas $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$ and $\frac{x^2}{a^2} - \frac{y^2}{b^2} = -1$ is

A. $4\left(a^2 + b^2\right)$

B. $2\left(a^2 + b^2\right)$

C. $a^2 + b^2$

D. $\frac{1}{2}\left(a^2 + b^2\right)$

Answer: B

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11. If the normals of the paralbola $y^2=4x$ drawn at the end points of its latus rectum are tangents to the circle $(x-3)^2 + (y+2)^2 = r^2$ then the value of r^2 is

A. 2

B. 3

C. 1

D. 4

Answer: A

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12. If x + y = k is a normal to the parabola $y^2 = 12x$ then the value of k is

A. 3

B. -1

C. 1

D. 9

Answer: D

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13. The ellipse $E_1 : \frac{x^2}{9} + \frac{y^2}{4}$ =1 is inscribed in a rectangle R whose sides are parallel to the coordinate axes. Another ellipse E_2 passing through the point (0,4) circumscribes the rectangle R. The eccentricity of the ellispe is

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

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

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

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

Answer: C

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14. Tangents are drawn to the hyperbola $\frac{x^2}{9} - \frac{y^2}{4}$ parallel to the straight line 2x - y= 1 . One of the points of contact of tangents on the hyperbola is `

A. $\left(\frac{9}{2\sqrt{2}}, \frac{-1}{\sqrt{2}}\right)$

B. $\left(\frac{-9}{2\sqrt{2}}, \frac{1}{\sqrt{2}}\right)$

C. $\left(\frac{9}{2\sqrt{2}}, \frac{1}{\sqrt{2}}\right)$

D. $(3\sqrt{3}, -2\sqrt{2})$

Answer: C

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15. The equation of the circle passing through the foci ellispe $\frac{x^2}{16} + \frac{y^2}{9} = 1$ having centre at (0,3) is

A. $x^2 + y^2 - 6y - 7 = 0$

B. $x^2 + y^2 - 6y + 7 = 0$

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

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

Answer: A

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16. Let C be the circle with centre at (1,1) and radius =1 . If T is the circle centered at (0,y) passing through the origin and touching the

circle C externally. Then the radius of T is equal to

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

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

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

D. $\frac{1}{4}$

Answer: D

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17. Consider an ellispe whose centre is of the origin and its major axis is along x-axis. If its eccentiricity is $\frac{3}{5}$ and the distance between its foci is 6, then the area of the quadrilateral insricbed in the ellipse with diagonals as major and minor axis of the ellipse is

A. 8

B. 32

C. 80

D. 40

Answer: D

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18. Area of the greatest rectangle inscribed in the ellipse $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$ is

A. 2ab

B. ab

C. $\sqrt{ab}$

D. $\frac{a}{b}$

Answer: A

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19. An ellipse has OB, as semi minor axis, F and F' its foci and the angle FBF' is a right angle. Then the eccentricity of the ellipse is :

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

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

C. $\frac{1}{4}$

D. $\frac{1}{\sqrt{3}}$

Answer: A

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20. The eccentricity of the ellispse $(x-3)^2+(y-4)^2=\frac{y^2}{9}$ is

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

B. $\frac{1}{3}$

C. $\frac{1}{3\sqrt{2}}$

D. $\frac{1}{\sqrt{3}}$

Answer: B

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21. If the two tangents drawn from a point P to the parabola $y^2 = 4x$ are at right angles then the locus of P is

A. 2x + 1=0

B. x = -1

C. 2x -1 =0

D. x =1

Answer: B

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22. The circle passing through (1,-2) and touching the axis of x at (3,0) passing through the point

A. $(-5, 2)$

B. (2,-5)

C. (5,-2)

D. (-2,5)

Answer: C

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23. The locus of a point whose distance from $(-2, 0)$ is $\frac{2}{3}$ times its distance from the line $x = \frac{-9}{2}$ is

A. a parabola

B. a hyperbola

C. an ellipse

D. a circle

Answer: C

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24. The values of m for which the lines y = mx + $2\sqrt{5}$ touches the hyperbola $16x^2 - 9y^2 = 144$ are the roots of $x^2 - (a+b)x - 4 = 0$ then the value of (a+b) is

A. 2

B. 4

C. 0

D. -2

Answer: C

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25. If the coordinates at one end of a diameter of the circle $x^2 + y^2 - 8x - 4y + c = 0$ are (11,2) the coordinates of the other end are

A. (-5,2)

B. (2,-5)

C. (5,-2)

D. (-2,5)

Answer: A

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Additional Questions Mcq

1. If (0,4) and (0,2) are the vertex and focus of a parabola then its equation is

A. $x^2 + 8y = 32$

B. $y^2 + 8x = 32$

C. $x^2 - 8y = 32$

D. $y^2 - 8x = 32$

Answer: A

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2. The equation of the directrix of the parabola

$y^2 + 4y + 4x + 2 = 0$ is

A. $x = -1$

B. x=1

C. $x = \frac{-3}{2}$

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

Answer: D

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3. Equation of tangent at (-4,-4) on $x^2 = -4y$ is

A. 2x-y + 4=0

B. 2x + y - 4=0

C. 2x -y -12=0

D. 2x + y + 4=0

Answer: A

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4. $y^2 - 2x - 2y + 5 = 0$ is a

A. circle

B. parabola

C. ellipse

D. hyperbola

Answer: A

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5. If a parabolic reflector is 20 cm in diameter and 5 cm deep, then its focus is

A. (0,5)

B. (5,0)

C. (10,0)

D. (0,10)

Answer: B

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6. The eccenticity of the ellipse $9x^2 + 5y^2 - 30y = 0$is

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

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

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

D. None of these

Answer: B

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7. The length of the latus rectum of the ellipse $\frac{x^2}{49} + \frac{y^2}{36} = 1$is

A. $\frac{98}{6}$

B. $\frac{72}{7}$

C. $\frac{72}{7}$

D. $\frac{98}{12}$

Answer: B

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8. If the distance between the foci is 2 and the distance between the directrices is 5 , then the equation of the ellipse is

A. $6x^2 + 10y^2 = 5$

B. $6x^2 + 10y^2 = 15$

C. $x^2 + 3y^2 = 10$

D. none

Answer: B

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9. In are ellispe , the distance between its foci is 6 and its minor axis is 8 , then e is

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

B. $\frac{1}{\sqrt{52}}$

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

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

Answer: C

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10. The equation

$$7x^2 - 6\sqrt{3}xy + 13y^2 - 4\sqrt{3} - 4y - 12 = 0$$

represents

A. parabola

B. ellipse

C. hyperbola

D. rectangular hyperbola

Answer: B

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11. The distance between the foci of a hyperbola is 16 and $e = \sqrt{2}$. Its equation is

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

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

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

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

Answer: C

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12. If the foci of the ellipse $\frac{x^2}{16} + \frac{y^2}{b^2} = 1$ and the hyperbola $\frac{x^2}{144} - \frac{y^2}{81} = \frac{1}{25}$ coincide

then b^2 is

A. 1

B. 5

C. 7

D. 9

Answer: C

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13. When the eccentricity of a ellipse becomes zero , then it becomes a

A. straight line

B. circle

C. point

D. parabola

Answer: B

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14. The director circle of the ellispe $\frac{x^2}{9} + \frac{y^2}{5} = 1$

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

B. $x^2 + y^2 = 9$

C. $x^2 + y^2 = 45$

D. $x^2 + y^2 = 14$

Answer: D

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15. The auxiliary circle of the ellipse $\frac{x^2}{25} + \frac{y^2}{16} = 1$

A. $x^2 + y^2 = 25$

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

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

D. $x^2 + y^2 = 5$

Answer: A

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16. The length of the diameter of a circle with centre (1,2) and passing through (5,5) is

A. 5

B. $\sqrt{45}$

C. 10

D. $\sqrt{50}$

Answer: C

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17. If (1,-3) is the centre of the circle $x^2 + y^2 + ax + by + 9 = 0$ its radius is

A. $\sqrt{10}$

B. 1

C. 5

D. $\sqrt{19}$

Answer: B

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18. If $y = 2x + c$ is a tangent to the circel $x^2 + y^2 = 5$, then c is

A. $- + 5$

B. $- + \sqrt{5}$

C. $- + 5\sqrt{2}$

D. $- + 2\sqrt{5}$

Answer: A

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Additional Questions Fill In The Blanks

1. The line y = mx + 1 is a tangent to the parabola $y^2 = 4x$ if m = _____

A. 1

B. 2

C. 3

D. 4

Answer: A

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2. The angle between the tangent drawn from (1,4) to the parabola $y^2 = 4x$ is _____

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

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

C. $\frac{\pi}{4}$

D. $\frac{\pi}{5}$

Answer: B

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3. If an ellispe $5x^2 + 7y^2 = 11$ the point (4,-3) lies _____ the ellipse

A. on

B. outside

C. inside

D. none

Answer: B

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4. If e_1, e_2 are eccentricities of the ellispe $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ and the hyperbola $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$ then

A. $e_1^2 - e_{2^2=1}$

B. $e_1^2 + e_2^2 = 1$

C. $e_1^2 - e_2^2 = 2$

D. $e_1^2 + e_2^2 = 2$

Answer: D

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5. The number of normals to the hyperbola $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$ from an external point is _____

A. 2

B. 4

C. 6

D. 5

Answer: B

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6. The point of contact of $y^2 = 4ax$ and the tangent $y = mx + c$ is

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

B. $\left(\frac{a}{m^2}, \frac{2a}{m}\right)$

C. $\left(\frac{a}{m}, \frac{2a}{m^2}\right)$

D. $\left(\frac{-a}{m^2}, \frac{-2a}{m}\right)$

Answer: B

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7. If $B.\ B^1$ are the ends of minor axis , F_1, F_2 are foci of the ellispe $\frac{x^2}{8} + \frac{y^2}{4} = 1$ then area of $F_1BF_2B^1$ is

A. 16

B. 8

C. $16\sqrt{2}$

D. $32\sqrt{2}$

Answer: B

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8. The length of major and minor axes of $4x^2 + 3y^2 = 12$ are ___-

A. $4, 2\sqrt{3}$

B. $2, \sqrt{3}$

C. $2\sqrt{3}, 4$

D. $\sqrt{3}, 2$

Answer: A

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9. the tangent at any point P on the ellipe $\frac{x^2}{6}+\frac{y^2}{3}=1$ whose centre C meets the major axis at T and PN is the perpendicular to the major axis. The CN CT = _____

A. $\sqrt{6}$

B. 3

C. $\sqrt{3}$

D. 6

Answer: D

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10. The locus of the point of intersection of perpendicular tangents to the hyperbola $\frac{x^2}{16} - \frac{y^2}{9} = 1$ is _____

A. $x^2 + y^2 = 25$

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

C. $x^2 + y^2 = 3$

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

Answer: D

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11. If t_1 and t_2 are the extremities of any focal chord of $y^2 = 4ax$ then $t_1 t_2$ is _____

A. -1

B. 0

C. $- + 1$

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

Answer: A

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12. The locus of the foot of perpendicular from the forcus on any tangent to$y^2 = 4ax$ is

A. $x^2 + y^2 = a^2 - b^2$

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

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

D. x=0

Answer: D

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13. The point of curve $y = 2x^2 - 6x - 4$ at which the tangent is parallel to x-axis is

A. $\left(\frac{5}{2}, \frac{-7}{12}\right)$

B. $\left(\frac{-5}{2}, \frac{-17}{2}\right)$

C. $\left(\frac{-5}{2}, \frac{17}{2}\right)$

D. $\left(\frac{3}{2}, \frac{-17}{2}\right)$

Answer: D

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14. The locus of the point of intersection of perependicular tangent of the parabola $y^2 = 4ax$ is

A. latus rectum

B. directrix

C. tangent at the vertex

D. axis of the parabola

Answer: B

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Additional Questions Choose The Odd Man Out

1. Choose the odd one out (1) x = $a\cos\theta, y = a\sin\theta$

(2) θ

(3) $0 \geq \theta \geq 2\pi$

(4)$(a\cos\theta, b\sin\theta)$

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2. Choose the odd one out (1) $y^2 = 4ax$

(2) $c = \frac{a}{m}$

(3) $c^2 = a^{2(1+m^2)}$

(4) $\left(\frac{a}{m^2}, \frac{2a}{m}\right)$

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3. Choose the odd one out (1) Transverse axis is parallel to x-axis

(2) Directrix are x = $- + \frac{a}{e}$

(3) Cenre is (0,0)

(4) Transvervse axis parallel to y-axis

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4. Choose the odd one out (1) Major axis paralle to x-axis

(2) $c^2 = a^2 - b^2$

(3) forward c units right and c units left of centre

(4) $c^2 = a^2 + b^2$

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5. Choose the odd one out (1) Vertex (h,k)

(2) Equation of directrix is x = h + a

(3) Axis of symmetry is y = k

(4) Length of latus rectum = 4a

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Additional Questions Choose The Incorrect Statement

1. The equation $x^2 + y^2 + 2gx + 2fy + c = 0$ reprsents the circle if

A. it is a second degree equation in x and y

B. co- efficient of x^2 = co- efficient of $y^2 \neq 0$

C. co-efficient of x = 1

D. co - efficient of xy = 0

Answer: C

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2. Condition for y = mx + c to be a tangent to the circle $x^2 + y^2 = a^2$ is

A. $c^2 = a^2(1 - m)^2$

B. $\frac{|C|}{\sqrt{1 + m^2}} = a$

C. $\frac{|C|}{\sqrt{1+m^2}=}$ radius

D. $c=\frac{a}{m}$

Answer: B

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3. In an ellispe $\frac{x^2}{9}+\frac{y^2}{5}=1$

A. Foci $(-+2,0)$

B. a = 9

C. Vertrices $(-+3,0)$

D. AA' = 6

Answer: B

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4. For the parabola $y^2 = -4\sqrt{2}x$.Find odd one out

A. focus is $(\sqrt{2}, 0)$

B. vertex is (0,0)

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

D. directrix is x = $\sqrt{2}$

Answer: A

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2 Marks

1. Find the equation of tangent to the circle

$x^2 + y^2 + 2x - 3y - 8 = 0at(2, 3)$

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2. Find the length of the tangent from (2,-3) to the circle $x^2 + y^2 - 8y - 9y + 12 = 0$

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3. Find the equation of the parabola with vertex at the origin , passing through (2,-3) and symmetric about x-axis.

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4. If a parabolic reflector is 24 cm in diameter and 6 cm deep, find its focus.

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5. If the line y = 3x + 1, touches the parabola $y^2 = 4ax$, find the length of the latus rectum ?

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6. Find the locus of a point which divides so that the sum of its distances from (-4,0) and (4,0) is 10 units.

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7. For the ellipse $x^2 + 3y^2 = a^2$ find the length of major and minor axis.

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8. find the eccentricity of the ellipse with foci on x-axis if its latus be equal to one half f of its major axis.

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9. Find the eccentricity of the hyperbola with foci on the x-axis if the length of its conjugate axis is $\left(\frac{3}{4}\right)^{\text{th}}$ of the length of its tranverse axis.

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10. Find the equation of the hyperbola whose vertices are $(0, \ - \ + 7)$ and $e = \frac{4}{3}$

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3 Marks

1. Find the circumference are area of the circle

$x^2 + y^2 - 2x + 5y + 7 = 0$

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2. find the value of p so that 3x + 4y - p =0 is a tangent to the circle $x^2 + y^2 - 64 = 0$

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3. Find the condition for the line lx + my + n =0 is a tangent to the circle $x^2 + y^2 = a^2$

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4. Find the area of the triangle found by the lines joining the vertex of the parabola $x^2 - 36y$ to the ends of the latus rectum.

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5. Find the equation of the ellipse whose $e = \frac{3}{4}$ foci on y-axis , centre at origin and passing through (6,4)

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6. Find the equation of the ellispe whose latus rectum is 5 and $e = \frac{2}{3}$

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7. find the equation of the hyperbola whose conjugate axis is 5 and the distance between the foci is 13.

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8. For the hyperbola $3x^2 - 6y^2 = -18$ find the length of transverse and conjugate axes and eccentricity .

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9. Find the value of c if y = x + c is a tangent to the hyperbola $9x^2 - 16y^2 = 144$

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10. Show that the line x + y + 1=0 touches the hyperbola $\frac{x^2}{16} - \frac{y^2}{15} = 1$ and find the co-ordinates of the point of contact.

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5 Marks

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

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

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2. An equilateral triangle is inscribed in the parabola $y^2 = 4ax$ whose vertex is at the vertex of the parabola. Find the length of its side.

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3. The guides of a railway bridge is a parabola with its vertex at the heighest point 15 m above the ends. If the span is 120 m, find the height of the bridge at 24 m from the middle point.

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4. The foci a hyperbola coincides with the foci of the ellispe $\frac{x^2}{25} + \frac{y^2}{9} = 1$. Find the

equation of the hyperbola if its eccentricity is 2.

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5. A kho - kho player in a practice sesssion while running realises that the sum of the distances from the two kho-kho poles from him is always 8m. Find the equation of the path traced by him of the distances between the poles is 6m.

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