MATHS

BOOKS - MARVEL MATHS (HINGLISH)

CIRCLE AND CONICS

ILLUSTRATIVE EXAMPLES

1. Find the equation of the circle having centre at (2,-3) , and passing through (1, 2) .

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2. Find the equation of the circle having

centre at (7,-2) , and touching the X-axis

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3. Find the equation of the circle having

centre at (3,2), and touching the line

$4x + 3y - 8 = 0$.

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4. Find the equation of the circle , centred at (1,4) , which

cuts off of a chord of length 4 units on the line

$3x + 4y + 1 = 0$

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5. Find the equation of the circle which passes through the two points (6,4),(8,-4) and has centre on the X-axis

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6. Find the equation of the circle passing through the point (1,9), and touching the line $3x + 4y + 6 = 0$ at the point (-2,0) .

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7. Find the equation of the circle which touches the line $x + 8 = 0$ at the point $(-8, 4)$, and passes through the origin .

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8. Show that the four point (4,6),(-3,5),(5,-1) and (1,7) are concyclic.

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9. Find the equation of the circle passing through the three points (0,0) ,(a,0) and (0,b).

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10. Find the co-ordinates of the centre and radius of the circle $3x^2 + 3y^2 + 6x + 4y - 3 = 0$

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11. Find the equation of the circle which is concentric with the circle $x^2 + y^2 - 6x - 4y - 3 = 0$, and has radius 5.

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12. Show that the x- and y-intercepts of the circle $x^2 + y^2 + 2gx + 2fy + c = 0$ are $2\sqrt{g^2 - c}$ and $2\sqrt{f^2 - e}$

Hence , find the condition that the (i) X-axis (ii) Y-axis

(iii) both X , and Y-axes touch the circle .

Also , find the equation of the locus of the centre of the circle which makes intercepts 2a and 2b on the X - and Y-axis respectively .

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13. Find the equations of the circles which touch Y-axis at the point (0,3) , and make an intercept of 8 units on the X-axis .

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14. Show that the two circles $x^2 + y^2 - 4x + 10y + 20 = 0$ and $x^2 + y^2 + 8x - 6y - 24 = 0$ touch each other . Also , find co-ordinates of their point of contact .

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15. Show that the two circles $x^2 + y^2 + 4x - 12y + 4 = 0$ and $x^2 + y^2 - 2x - 4y + 4 = 0$ touch each other . Also , find the co-ordinates of the point of contact .

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16. Find the equation of the circle , centred at (-1,4) , which touches the circle $x^2 + y^2 - 6x - 2y + 1 = 0$ externally

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17. If the two circle

$x^2 + y^2 - 10x - 14y + k = 0$

and $x^2 + y^2 - 4x - 6y + 4 = 0$

are orthogonal , find k.

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18. Find k , if the line y = 2x + k touches the circle $x^2 + y^2 - 4x - 2y = 0$

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19. Find the equation of the tangent to the circle $x^2 + y^2 + 5x - 3y - 4 = 0$ at the point $(1, 2)$.

A. $x + 7y = 9$

B. $x + y = 9$

C. $7x + y = 9$

D. $x + 7y = 12$

Answer: C

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20. Find the co-ordinates f the fouces , equation of the directrix , co-ordinates of the ends and length of the latus rectum of the parabola :

$3y^2 = 16x$

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21. Find the co-ordinates f the fouces , equation of the directrix , co-ordinates of the ends and length of the latus rectum of the parabola :

$x^2 + 16y = 0$

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22. Find the equation of the parabola having (3,-6) and (3,6) as the extremities of the latus rectum .

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23. Find the measure of the angle subtended by the latus rectum of the parabola $y^2 = 4ax$ at the vertex of the parabola .

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24. A line perpendicular to the axis of the parabola $y^2 = 16x$ intersects the parabola in two points A and B . If AB = 32 , show that $\angle AOB$ is a right angle . Also , find the area of ΔAOB .

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25. Find the co-ordinates of the point on the parabola $2y^2 = 7x$, whose parameter is (-2). Also find its focal distance .

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26. If (x_1, y_1) and (x_2, y_2) are the ends of a focal chord of the parabola $y^2 = 4ax$, evaluate : $x_1x_2 + y_1y_2$.

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27. If PSQ is a focal chord of the parabola $y^2 = 4ax$ such that SP = 3 and SQ = 2 , find the latus rectum of the parabola .

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28. If t is the parameter of one end of a focal chord of the parabola $y^2 = 4ax$, show that the length of this focal chord is $\left(t + \frac{1}{t}\right)^2$.

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29. If θ is the inclination of a chord of $y^2 = 4ax$ drawn from its vertex , show that its length is

$4a \cdot \csc\theta \cdot \cot\theta$.

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30. Find the eccentricity and co-ordinates of foci of the ellipse

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

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31. Find the eccentricity , co-ordinates of foci, lengths of axes and length of latus-rectum of the ellipse

$$\left(x^2/25\right)+\left(y^2/9\right)=1$$

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32. Find the lengths of the axes , eccentricity, co-ordinates of foci, equations of directrices and langth of latus rectum of the ellipse $9x^2+4y^2=36$.

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33. Find the equation of the ellipse , referred to is principal axes , for which eccentricity is (1/3) and foci are $(\pm 4, 0)$

A. $\frac{x^2}{144} + \frac{y^2}{128} = 1$

B. $\frac{x^2}{128} + \frac{y^2}{144} = 1$

C. $\frac{x^2}{128} - \frac{y^2}{144} = 1$

D. $\frac{x^2}{144} - \frac{y^2}{128} = 1$

Answer: A

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34. Find the equation of the ellipse , referred to is principal axes , for which

minor axis = 8 and eccentricity $= 3/5$

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35. Find the equation of the ellipse , referred to is principal axes , for which

semi-minor axis = 3 , and passes through $\left(-2\sqrt{5}, 2 \right)$

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36. Find the equation of the ellipse , referred to is principal axes , for which

eccentricity = 2/3 , and passes through $(2, -5/3)$

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37. Find the equation of the ellipse , referred to is principal axes , for which

focus is at (1,0) and equation of directrix is x = 4

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38. Find the equation of the ellipse , referred to is principal axes , for which

distance between foci= minor axis, and latus rectum = 10 .

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39. An ellipse meets the line $\frac{x}{7}+\frac{y}{2}=1$ on the X-axis, and the line $\frac{x}{3}-\frac{y}{5}=1$ on the Y-axis. If its principle axes lie along the co-ordinate axes , find its eccentricity.

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40. An ellipse , centred at the origin , has major axis 2a . If it passes through a given (x_1, y_1) , show that its eccentricity is $\sqrt{\frac{x_1^2 + y_1^2 - a^2}{x_1^2 - a^2}}$

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41. Any point whose x and y co-ordinates satisfy the equations $\frac{1-(x/a)}{t^2} = \frac{1+(x/a)}{1} = \frac{y/b}{t}$, where t is an non-zero parameter, lies on a/m

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42. The focus of the parabola $y^2 = 8x$ is one of the vertices of the hyperbola $\left(x^2/a^2\right) - \left(y^2/b^2\right) = 1$. If length of the conjugate axis of this hyperbola is 2. find the equation , eccentricity and length of the latus rectum of the hyperbola

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43. Focus of a parabola $y^2 = 4ax$ coincides with the focus of the hyperbola $9x^2 - 16y^2 = 144$ which is on the positive direction of X-axis . Find the equation of the tangent line to the parabola at the end of the latus rectum I which lies in the first quadrant .

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44. Find the equation of the hyperbola in standard form , if :

conjugata axis = 5 and distance between foci = 13

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45. Find the equation of the hyperbola in standard form , if :

eccentricity = 3/2 and distance between directrices = 8/3

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46. Find the equation of the hyperbola in standard form , if :

it is confocal with the ellipse $\left(x^2/9\right)+\left(y^2/5\right)=1$

and its eccentricity is (5/6) + eccentricity of the parabola $5y^2=9x$

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47. The abscissa of a point can be expressed as 3 times the sum of a non-zero number and its reciprocal . If its ordinate can be written as 2 times the difference of that number and its reciprocal , find equation of locus of the point and identify the curve

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MULTIPLE CHOICE QUESTIONS

1. Equation of circle centred at (2,-3) , and passing through (-1,2) , is

A. $x^2 + y^2 - 4x - 6y - 34 = 0$

B. $X^2 + y^2 + 4x - 6y + 34 = 0$

C. $X^2 + y^2 + 4x + 6y + 21 = 0$

D. $X^2 + y^2 - 4x + 6y - 21 = 0$

Answer: D

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2. Equation of circle centred at (1,-1) , and passing through (3,2) , is

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

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

C. $x^2 + y^2 + 2x + 2y - 11 = 0$

D. $x^2 + y^2 - 2x + 2y + 11 = 0$

Answer: B

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3. Equation of circle cnetred at (5,-2) , and touching X-axis is

A. $x^2 + y^2 + 10x + 4y + 25 = 0$

B. $x^2 + y^2 + 10x - 4y + 25 = 0$

C. $x^2 + y^2 - 10x + 4y + 25 = 0$

D. $x^2 + y^2 - 10x - 4y - 25 = 0$

Answer: C

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4. Find the equation of the circle having centre at (7,-2) , and touching the X-axis

A. $x^2 + y^2 - 14x + 4y + 49 = 0$

B. $(x + 7)^2 + (y - 2)^2 = 4$

C. $(x - 7)^2 + (y - 2)^2 = 49$

D. $x^2 + y^2 + 14x - 4y + 4 = 0$

Answer: A

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5. Equation of of circle centred at (-4, 3) , and tangent to Y-axis , is

A. $x^2 + y^2 - 8x - 6y - 9 = 0$

B. $x^2 + y^2 - 8x + 6y + 9 = 0$

C. $x^2 + y^2 + 8x - 6y + 9 = 0$

D. $x^2 + y^2 - 8x - 6y - 9 = 0$

Answer: C

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6. Equation of circle centred at $(-g, -f)$, and tangent to Y-axis ,is

A. $x^2 + y^2 + 2gx + 2fy + f^2 = 0$

B. $x^2 + y^2 - 2gx - 2fy - f^2 = 0$

C. $x^2 + y^2 - 2gx + 2fy + g^2 = 0$

D. $x^2 + y^2 - 2gx - 2fy - g^2 = 0$

Answer: A

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7. Equation of circle centred at (0,-3) , and tanged to X-axis, is

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

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

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

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

Answer: C

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8. Equation of circle centred at (2,0) , and touching Y-axis is

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

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

C. $x^2 - y^2 - 4t = 0$

D. $x^2 + y^2 + 4t = 0$

Answer: B

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9. Equation of circle centred at origin , and touching the line

$3x - 4y + 20 = 0$ is

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

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

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

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

Answer: D

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10. Equation of circle centred at (3,1), and touching the line $8x - 15y + 25 = 0$, is

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

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

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

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

Answer: B

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

A. $x^2 + y^2 - 6x + 2y - 38 = 0$

B. $x^2 + y^2 - 6x - 2y - 38 = 0$

C. $x^2 + y^2 + 6x - 2y + 38 = 0$

D. $x^2 + y^2 + 6x - 2y - 38 = 0$

Answer: A

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12. Equation of circle centred at (3,-2) , which cuts off a chord of length 6 from the line $4x - 3y + 2 = 0$, is

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

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

C. $x^2 + y^2 - 6x + 4y - 12 = 0$

D. $x^2 + y^2 - 4x + 6y + 12 = 0$

Answer: C

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13. Equation of circle centred on X-axis, and passing through (6,4) and (8,-4), is

A. $x^2 + y^2 + 14x + 32 = 0$

B. $x^2 + y^2 + 14y + 32 = 0$

C. $x^2 + y^2 - 14y + 32 = 0$

D. $x^2 + y^2 - 14x + 32 = 0$

Answer: D

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14. Equation of circle centred on Y-axis , and passing through (4,6) and (6,11), is

A. $x^2 + y^2 - 21y + 74 = 0$

B. $x^2 + y^2 - 21x + 74 = 0$

C. $x^2 + y^2 + 21y - 74 = 0$

D. $x^2 + y^2 - 21y = 0$

Answer: A

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15. Equation of circle centred on the line $x - 2y + 9 = 0$, and passing throught (1,-4) and (5,2), is

A. $x^2 + y^2 + 6x + 6y + 47 = 0$

B. $x^2 + y^2 \_ 6x + 6y + 47 = 0$

C. $x^2 + y^2 + 6x - 6y - 47 = 0$

D. $x^2 + y^2 - 6x - 6y - 47 = 0$

Answer: C

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16. Equation of circle passing through (-2,0),(4,0) , and having radius 5, is

A. $x^2 + y^2 \pm 2x + 8y - 8 = 0$

B. $x^2 + y^2 - 2x \pm 8y - 8 = 0$

C. $x^2 + y^2 + 2x - 8y \pm 8 = 0$

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

Answer: B

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17. Equation of circle passing through A(-1,-3), B (3,0) and touching line $4x + 3y - 12 = 0$ at B , is

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

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

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

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

Answer: D

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18. Equation of circle passing throught (0,0),(3,0) and (0,2) is

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

B. $x^2 + y^2 - 3x + 2y + 6 = 0$

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

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

Answer: C

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19. Equation of circle through the origin , having intercepts (6) and (-4) on X- and Y-axes respectively ,is

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

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

C. $x^2 + y^2 + 6x - 4y + 11 = 0$

D. $x^2 + y^2 - 4x - 6y - 11 = 0$

Answer: A

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20. Show that equation of the circle passing through the origin and cutting intercepts a and b on the coordinate axes is $x^2 + y^2 - ax - by = 0$

A. $x^2 + y^2 + ax + by = 0$

B. $x^2 + y^2 - ax - by = 0$

C. $x^2 + y^2 - ax + by = 0$

D. $x^2 + y^2 + bx + ay = 0$

Answer: B

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21. Equation of circumcircle of square OACB of side a, where OA and OB are along coordinate axes , is

A. $x^2 + y^2 - ax + ay = 0$

B. $x^2 + y^2 + ax - ay = 0$

C. $x^2 + y^2 + ax + ay = 0$

D. $x^2 + y^2 - ax - ay = 0$

Answer: D

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22. If line y= 2x meets circle $x^2 + y^2 - 4x = 0$ in point A and B , then equation of circle of which AB is diameter is

A. $5x^2 + 5y^2 - 4x + 8y = 0$

B. $5x^2 + 5y^2 - 4x + 8y = 0$

C. $5x^2 + 5y^2 - 8x - 4y = 0$

D. $5x^2 + 5y^2 + 8x + 4y = 0$

Answer: B

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23. If line y = 4x meets circle $x^2 + y^2 - 17x = 0$ in points A and

B , then equation of circle of which AB is a diameter is

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

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

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

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

Answer: A

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24. Equation of circle of radius 5, centred on X-axis and touch Y-axis , is

A. $x^2 + y^2 \pm 5x = 0$

B. $x^2 + y^2 \pm 5y = 0$

C. $x^2 + y^2 \pm 10y = 0$

D. $x^2 + y^2 \pm 10x = 0$

Answer: D

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25. Equation of circle of radius 5, centred on Y-axis and touching X-axis , is

A. $x^2 + y^2 \pm 10x = 0$

B. $x^2 + y^2 \pm 10y = 0$

C. $x^2 + y^2 \pm 5y = 0$

D. $x^2 + y^2 \pm 10x \pm 10y = 0$

Answer: B

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26. Equation of circle of radius 5, centred on X -axis and passing through origin , is

A. $x^2 + y^2 \pm 10x = 0$

B. $x^2 + y^2 \pm 10y = 0$

C. $x^2 + y^2 \pm 10x \pm 10y = 0$

D. $x^2 + y^2 = 10$

Answer: A

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27. Equation of circle of redius 5 , centred on Y-axis and passing throught origin , is

A. $x^2 + y^2 \pm 10x = 0$

B. $x^2 + y^2 \pm 10y = 0$

C. $x^2 + y^2 \pm 10x \pm 10y = 0$

D. $x^2 + y^2 + 10 = 0$

Answer: B

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28. Equation of circle of radius 5, touching both co-ordinate axes , and passing through (1,2). Is

A. $x^2 + y^2 \pm 10x + 10y - 25 = 0$

B. $x^2 + y^2 + 10x \pm 10y - 25 = 0$

C. $x^2 + y^2 \pm 10x \pm 10y - 25 = 0$

D. $x^2 + y^2 - 10x - 10y + 25 = 0$

Answer: D

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29. Equation of circle of area 154 sq. units , two of whose diameters are $2x - 3y + 12 = 0$ and $x + 4y - 5 = 0$, is

A. $x^2 + y^2 - 6x - 4y + 36 = 0$

B. $x^2 + y^2 + 6x + 4y - 36 = 0$

C. $x^2 + y^2 + 6x - 4y - 36 = 0$

D. $x^2 + y^2 - 6x + 4y + 36 = 0$

Answer: C

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30. Equation of circle through (5,0) , two of whose diameters are x + 2y = 7 and 3x - y = 0 , is

A. $x^2 + y^2 - 2x - 6y - 15 = 0$

B. $x^2 + y^2 + 2x + 6y - 35 = 0$

C. $x^2 + y^2 + 2x - 6y - 35 = 0$

D. $x^2 + y^2 - 6x - 2y - 16 = 0$

Answer: D

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31. Equation of circle having radius 5, and touching X-axis at (-1,0), is

A. $x^2 + y^2 \pm 2x + 10y - 1 = 0$

B. $x^2 + y^2 \pm 2x - 10y + 1 = 0$

C. $x^2 + y^2 + 2x + 10y \pm 1 = 0$

D. $x^2 + y^2 + 2x \pm 10y + 1 = 0$

Answer: D

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32. Equation of circle throught origin, having radius 5 and abscissa of centre is (-3) .

A. $x^2 + y^2 \pm 8x + 6y = 0$

B. $x^2 + y^2 + 6x \pm 8y - 25 = 0$

C. $x^2 + y^2 + 6x \pm 8y = 0$

D. $x^2 + y^2 + 3x \pm 4y = 0$

Answer: C

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33. Centre and radius of circle $2x^2 + 2y^2 - 6x + 4y - 3 = 0$ are

A. $\left(-\frac{2}{3}, 1\right), \frac{\sqrt{19}}{2}$

B. $\left(\frac{2}{3}, -1\right), \frac{\sqrt{19}}{2}$

C. $\left(\frac{-3}{2}, -1\right), \frac{\sqrt{19}}{2}$

D. $\left(\frac{2}{3}, 1\right), \frac{\sqrt{11}}{2}$

Answer: B

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34. Equation of circle of area 616 sq. units , concentric with circle $x^2 + y^2 + 4x - 4y - 28 = 0$ is

A. $x^2 + y^2 - 4x + 4y = 188 = 0$

B. $x^2 + y^2 + 4x - 4y - 188 = 0$

C. $x^2 + y^2 - 4x - 4y - 188 = 0$

D. $x^2 + y^2 + 4x - 4y + 28 = 0$

Answer: B

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35. Equation of circle of circumference 14π units , concentric with circle $x^2 + y^2 - 6x + 10y = 0$, is

A. $x^2 + y^2 - 6x + 10y - 15 = 0$

B. $x^2 + y^2 + 6x - 10y - 15 = 0$

C. $x^2 + y^2 - 6x + 10y - 2 = 0$

D. $x^2 + y^2 - 6x + 10y + 15 = 0$

Answer: A

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36. If radius of circle $2x^2 + 2y^2 - 8x + 4fy + 26 = 0$

is 4, then f=

A. ± 2

B. ± 3

C. ± 4

D. ± 5

Answer: D

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37. Lengths of intercepts made by circle

$x^2 + y^2 + x - 4y - 12 = 0$ on co-ordinates axes are

A. $5, 6$

B. 6,7

C. 7,8

D. 8,9

Answer: C

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38. Lengths of intercepts by circle

$x^2 + y^2 - 6x + 4y - 12 = 0$ on line $4x - 3y + 2 = 0$ is

A. 4

B. 6

C. 8

D. 3

Answer: B

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39. Two circles $x^2 + y^2 - 4x + 10y + 20 = 0$ and $x^2 + y^2 + 8x - 6y - 24 = 0$

A. touch externally

B. touch internally

C. are orthogonal

D. are disjoint

Answer: A

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40. Two circles $x^2 + y^2 = 25$ and

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

A. touch externally

B. touch internally

C. are orthogonal

D. are concentric

Answer: B

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41. If circles $x^2 + y^2 + 2gx + 2fy + c = 0$

and $x^2 + y^2 + 2x + 2y + 1 = 0$ are orthogonal ,

then $2g + 2f - c =$

A. 0

B. 1

C. -1

D. 2

Answer: C

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42. If circles $x^2 + y^2 + 2gx + 2fy + e = 0$

and $x^2 + y^2 + 2x + 2y + 1 = 0$ are orthogonal , then

$2g + 2f - e =$

A. 0

B. 1

C. -1

D. 2

Answer: B

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43. If the two circle

$x^2 + y^2 - 10x - 14y + k = 0$

and $x^2 + y^2 - 4x - 6y + 4 = 0$

are orthogonal , find k.

A. 55

B. 56

C. 57

D. 58

Answer: D

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44. If two circles $x^2 + y^2 - 2ax + c = \ = 0$ and $x^2 + y^2 - 2by + c = 0$ touch each other , then c =

A. $\frac{a^2 + b^2}{a^2 b^2}$

B. $\frac{a^2 b^2}{a^2 + b^2}$

C. $\frac{1}{a^2} - \frac{1}{b^2}$

D. $\frac{1}{a^2} + \frac{1}{b^2}$

Answer: B

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45. If the circle $x^2 + y^2 = a^2$ cuts off a chord of length $2b$ from the line $y = mx + c$, then

A. $\left(1 + m^2\right)\left(a^2 + b^2\right)$

B. $\left(1 - m^2\right)\left(a^2 + b^2\right)$

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

D. $\left(1 + m^2\right)\left(a^2 - b^2\right)$

Answer: D

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46. What is the equation of circle which touches the lines $x = 0$, y = 0 and $x = 2$?

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

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

C. $x^2 + y^2 \pm 2x - 2y - 1 = 0$

D. $x^2 + y^2 \pm 4x \pm 4y + 8 = 0$

Answer: A

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47. Equation of diameter of circle

$(x - 5)(x - 7)(y - 1) = 0$,

parallel to co-ordinate axes , are

A. $x^2 + y^2 \pm 16x \pm 16y + 8 = 0$

B. $x^2 + y^2 \pm 8x \pm 8y + 16 = 0$

C. $x^2 + y^2 \pm 8x \pm 8y + 16 = 0$

D. $x^2 + y^2 \pm 4x \pm 4y + 8 = 0$

Answer: C

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48. Equations of diameters of circle

$(x - 5)(x - 1) + (y - 7)(y - 1) = 0$.

parallel to co-ordinates axes , are

A. $x = 1, y = 1$

B. $x = 5, y = 7$

C. $x = 5, y = 1$

D. $x = 3, y = 4$

Answer: D

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49. If circle $x(x-1) + y(y-1) = c(x+y-1)$ touches X-axis , then c =

A. 4

B. 1

C. -1

D. -4

Answer: B

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50. Radii of circles $x^2 + y^2 = 1$, $x^2 + y^2 - 2x - 6y = 6$ and $x^2 + y^2 - 4x - 12y = 9$ are in

A. A .P

B. G.P.

C. H.P.

D. no progression

Answer: D

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51. A circle of radius 2 lies in the first quadrant and touches both the axes. Find the equation of the circle with centre at $(6, 5)$ and touching the above circle externally.

A. $x^2 + y^2 + 12x - 10y + 52 = 0$

B. $x^2 + y^2 - 12x - 10y - 52 = 0$

C. $x^2 + y^2 - 12x - 10y + 52 = 0$

D. $x^2 + y^2 + 12x + 10y + 52 = 0$

Answer: C

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52. Find the equation of the circle the end points of whose diameter are the centres of the circle :

$x^2 + y^2 + 6x - 14y = 1$ and $x^2 + y^2 - 4x + 10y = 2$.

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

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: C

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53. The sides of a square are $x = 2, x = 3, y = 1$ and $y = 2$. Find the equation of the circle drawn on the diagonals of the square as its diameter.

A. $x^2 + y^2 + 5x + 3y - 8 = 0$

B. $x^2 + y^2 + 5x - 3y + 8 = 0$

C. $x^2 + y^2 - 5x - 3y + 8 = 0$

D. $x^2 + y^2 - 5x - 3y - 8 = 0$

Answer: C

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54. If (2,-1) lies on $x^2 + y^2 + 2gx + 2fy + c = 0$, which is concentric with $x^2 + y^2 + 4x - 6y + 3 = 0$, then c =

A. 19

B. -19

C. 21

D. -21

Answer: B

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55. If one end of a diameter of the circle $x^2 + y^2 - 8x - 14y + c = 0$ is the point $(-3, 2)$, then its other end is the point.

A. (5,3)

B. (6,2)

C. (1,-8)

D. (11,2)

Answer: D

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56. If ends of a diameter of a circle are (-4,3) and (12,-1) , then y-intercept of the circle is

A. $2\sqrt{13}$

B. $4\sqrt{13}$

C. $8\sqrt{13}$

D. $12\sqrt{13}$

Answer: B

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57. If abscissas and ordinates of points A , B are roots of equation $x^2 - 3x + 2 = 0$ and $y^2 - 7y + 12 = 0$, then equation of circle with AB as a diameter is

A. $x^2 + y^2 - 3x + 7y + 14 = 0$

B. $x^2 + y^2 + 3x - 7y + 14 = 0$

C. $x^2 + y^2 + 3x + 7y + 14 = 0$

D. $x^2 + y^2 - 3x - 7y + 14 = 0$

Answer: D

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58. Equation of that diameter of circle $x^2 + y^2 - 6x + 2y - 8 = 0$, which passes through origian , is

A. $x - 3y = 0$

B. $x + 3y = 0$

C. $3x - y = 0$

D. $3x + y = 0$

Answer: B

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59. Equation of circle , concentric with circle

$x^2 + y^2 - 6x + 12y + 15 = 0$ and of double its radius , is

A. $x^2 + y^2 - 6x + 12y + 75 = 0$

B. $x^2 + y^2 - 6x - 12y + 75 = 0$

C. $x^2 + y^2 - 6x - 12y - 75 = 0$

D. $x^2 + y^2 - 6x + 12y - 25 = 0$

Answer: C

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60. Equation of circle which touches line x = y at the origin , and passes through (2,1), is

A. $x^2 + y^2 + 5x + 5y = 0$

B. $x^2 + y^2 + 5x - 5y = 0$

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

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

Answer: C

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61. If equation of a circle is

$(4a-3)x^2+ay^2+6x-2y+2=0,$

then its centre is

A. $(3,\ -1)$

B. $(3,1)$

C. $(-3,1)$

D. $(-3,\ -1)$

Answer: C

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62. If the equation

$3x^2+3y^2+kxy+9x+(k-6)y+3=0$

represents a circle , then the radius of this circle is

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

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

C. $\frac{\sqrt{17}}{2}$

D. $\frac{\sqrt{17}}{3}$

Answer: B

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63. Equation $x^2 + y^2 - 8x + 6y + 25 = 0$ represents

A. a circle

B. a pair of lines

C. a point

D. an ellipse

Answer: C

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64. If lines $12x + 5y + 16 = 0$ and $12x + 5y - 10 = 0$ both touch the same circle , then radius radius of this circle is

A. 1

B. 2

C. 3

D. 4

Answer: A

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65. Abscissas and ordinates of points A and B are roots of equation $x^2 + 2ax - b^2 = 0$ and $y^2 + 2py - q^2 = 0$ respectively. Equation of circle with AB as a diameter is

A. $x^2 + y^2 + 2ax + 2py + b^2 + q^2 = 0$

B. $x^2 + y^2 - 2ax - 2py - b^2 - q^2 = 0$

C. $x^2 + y^2 - 2ax + 2py - b^2 - q^2 = 0$

D. $x^2 + y^2 - 2ax - 2py + b^2 + q^2 = 0$

Answer: C

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66. Two points on the circle $x^2 + y^2 - 12x - 16y + 75 = 0$, one

nearest to the origin and the other farthest from are

A. (3,4), (9,(12)

B. (3,2),(9,12)

C. $(-3, 4), (9, 12)$

D. $(3, 4), (, -12)$

Answer: A

Watch Video Solution

67. Two circles $x^2 + y^2 - 2x - 4y = 0$

and $x^2 + y^2 - 8y - 4 = 0$

A. touch externally

B. touch internally

C. are orthogonal

D. do not touch

Answer: B

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68. If circles $x^2 + y^2 = 9$ and $x^2 + y^2 + 2ax + 2y + 1 = 0$ touch each other , then a =

A. 0

B. 1

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

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

Answer: C

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69. If lines $3x - 4y + 4 = 0$ and $6x - 8y - 7 = 0$ touch the same

circle , then its radius is

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

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

C. $\frac{7}{10}$

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

Answer: B

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70. If circles $x^2 + y^2 - 3x + ky - 5 = 0$ and $4x^2 + 4y^2 - 12x - y - 9 = 0$ are concentric , then k =

A. $\frac{-1}{8}$

B. $\frac{1}{8}$

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

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

Answer: D

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71. Centre of circle , passing through (0,0) ,(a,0) and (0,b) , is

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

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

C. (b,a)

D. (a,b)

Answer: B

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72. If line $2x - y + k = 0$ is a diameter of circle

$x^2 + y^2 + 6x - 6y + 5 = 0$, then k =

A. 12

B. 9

C. 3

D. 8

Answer: B

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73. Determine equation of the circle whose diameter is the chord $x + y = 1$ of the circle $x^2 + y^2 = 4$

A. $x^2y^2 - X - Y + 3 = 0$

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

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

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

Answer: C

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74. If (h,k) is the centre of a circle passing through the origin then its equation is

A. $x^2 + y^2 - hx - ky = 0$

B. $x^2 + y^2 + hx - ky = 0$

C. $x^2 + y^2 + 2hx + 2ky = 0$

D. $x^2 + y^2 - 2hx - 2ky = 0$

Answer: D

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75. If circles $(x-1)^2+y^2=a^2$ and $(x+2)^2+y^2=b^2$ touch each other externally , then

A. $a-b=3$

B. $a^2+b^2=1$

C. a + b =1

D. $a+b=3$

Answer: D

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76. The centre of circle inscribed in a square formed by lines $x^2-8x+12=0 and y^2-14y+45=0$ is $(4,7)$ $(7,4)$ $(9,4)$ $(4,9)$

A. (4,7)

B. (7,4)

C. (9,4)

D. (4,9)

Answer: A

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77. The radius of the circle, having centre at $(2, 1)$, whose one of the chord is a diameter of the circle $x^2 + y^2 - 2x - 6y + 6 = 0$

A. 1

B. 2

C. 3

D. $\sqrt{3}$

Answer: C

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

A. $x^2 + y^2 + 18x + 16y + 120 = 0$

B. $x^2 + y^2 + 18x - 16y + 120 = 0$

C. $x^2 + y^2 - 18x + 16y + 120 = 0$

D. $x^2 + y^2 + 18x + 16y - 120 = 0$

Answer: B

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79. If circles $x^2 + y^2 + 2g_1x + 2f_1y = 0$ and $x^2 + y^2 + 2g_2x + 2f_2y = 0$ touch each other, then

A. $f_1f_2 = \ = g_1g_2$

B. $f_1g_1 = f_2g_2$

C. $(f_1g_1)^2 = (f_2g_2)^2$

D. $f_1g_2 = f_2g_1$

Answer: D

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80. The locus of the point whose co-ordinates are

$x = 3\cos\theta + 2, y = 3\sin\theta - 4$, where θ is a parameter , is

A. circle

B. parabola

C. ellipse

D. hyperbola

Answer: A

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81. The radius of the circle

$t^2x^2 + t^2y^2 - 2at^3x - 2aty + a^2t^4 - a^2t^2 + a^2 = 0$ is

A. a

B. t

C. $at + \frac{a}{t}$

D. $t + \frac{1}{t}$

Answer: A

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82. If the origin lies inside the circle

$x^2 + y^2 + 2gx + 2fy + c = 0$, then

A. $g < 0$

B. $f < 0$

C. $c < 0$

D. fg = c

Answer: C

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83. If the co-ordinates of a point P are $x = at^2$, $y = a\sqrt{1 - t^4}$, where t is a parameter , then the locus of P is a/an

A. circle

B. parabola

C. ellipse

D. hyperbola

Answer: A

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84. Equation of circle which passes through (-1,2) and (1,2) , and touches the line y = 5 , is

A. $9x^2 + 9y^2 - 60y + 75 = 0$

B. $9x^2 + 9y^2 - 60 - 75 = 0$

C. $9x^2 + 9y^2 + 60y - 75 = 0$

D. $9x^2 + 9y^2 + 60 + 75 = 0$

Answer: A

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85. If a square is inscribed in the circle $x^2 + y^2 + 2gx + 2fy + c = 0$ then the length of each side of the square is

A. $2\sqrt{g^2+f^2-c}$

B. $2(g^2+f^2-c)$

C. $g^2 > f^2+c$

D. $\sqrt{2(g^2+f^2-c)}$

Answer: D

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86. The equation $x^2+y^2+2gx+2fy+c=0$ represents a circle of non-zero radius , if

A. $g^2+f^2 > c$

B. $g^2+f^2 < c$

C. $g^2 > f^2+c$

D. $g^2 < f^2 + c$

Answer: A

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87. If r_1, r_2 and r_3 are the radii of the circle $x^2 + y^2 - 4x + 6y = 5$, $x^2 + y^2 + 6x - 4y = 3$ and $x^2 + y^2 - 2x + 4y = 8$

A. $r_1 > r_2 > r_3$

B. $r_2 > r_3 > r_1$

C. $r_3 > r_1 > r_2$

D. $r_1 > r_3 > f_2$

Answer: A

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88. If the lines $5x - 12y = 5$ and $10x - 24y + 3 = 0$ are tangents to the same circle , then diameter of the circle is

A. 1

B. 5

C. 8

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

Answer: D

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89. If the circle described on the join of (2,3) and (3,a) as a diameter passes through the origin , then : a =

A. 2

B. -2

C. 3

D. -3

Answer: B

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90. The radius of the circle, having centre at $(2, 1)$, whose one of the chord is a diameter of the circle $x^2 + y^2 - 2x - 6y + 6 = 0$

A. 1

B. 2

C. 3

D. $\sqrt{3}$

Answer: C

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91. Area of the circle

$x^2 + y^2 + 2\cos\theta\sin\phi \cdot x + 2\sin\phi \cdot y - \cos^2\phi = 0$, is

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

B. 4π

C. 9π

D. π

Answer: D

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92. The sides of a square are $x = 2, x = 3, y = 1$ and $y = 2$. Find the equation of the circle drawn on the diagonals of the square as its diameter.

A. $x^2 + y^2 - 5x - 3y + 8 = 0$

B. $x^2 + y^2 + 5x - 3y + 8 = 0$

C. $x^2 + y^2 + 5x + 3y - 8 = 0$

D. $x^2 + y^2 + 5x + 3y + 8 = 0$

Answer: A

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93. If the equation

$3x^2 + 3y^2 + kxy + 9x + (k-6)y + 3 = 0$

represents a circle , then the radius of this circle is

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

B. $\frac{\sqrt{17}}{2}$

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

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

Answer: A

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94. If the two circle

$x^2 + y^2 - 3x + ky - 5 = 0$ and

$4x^2 + 4y^2 - 12x - y - 9 = 0$ are concentric , then : k =

A. $-\frac{1}{8}$

B. $\frac{1}{8}$

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

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

Answer: D

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95. Equation of the chord of the circle $x^2 + y^2 - 4x = 0$ whose mid-point is (1,0) , is

A. x= 1

B. x = 2

C. y = 1

D. y = 2

Answer: A

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96. Find the equation of the circle passing through the origin and the points where the line $3x + 4y = 12$ meets the axes of coordinates.

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

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

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

D. $x^2 + y^2 + 4x + 3y = 0$

Answer: B

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97. The equation of the the circle having x - y - 2 = 0 and x - y + 2 = 0 as two tangents , and x + y = 0 as a diameter is

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

B. $x^2 + y^2 - 2x + 2y - 1 = 0$

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

D. $x^2 + y^2 = 1$

Answer: C

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98. Area of a circle in which a chord of length $\sqrt{2}$ makes an angle $\frac{\pi}{2}$ at the centre is

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

B. 2π

C. π

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

Answer: C

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99. An acute triangle PQR is inscribed in the circle $x^2 + y^2 = 25$. If Q and R have coordinates (3, 4) and (-4, 3) respectively, then find $\angle QPR$.

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

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

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

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

Answer: C

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100. Centre of the circle toucing y-axis at (0,3) and making an intercept 2 units on positive X-axis is

A. $(10, \sqrt{3})$

B. $(\sqrt{3}, 10)$

C. $(\sqrt{10}, 3)$

D. $(3, \sqrt{10})$

Answer: C

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101. Circle $x^2 + y^2 - 8x + 4y + 4 = 0$ touches

A. X-axis

B. Y-axis

C. both X-axis and Y-axis

D. none of the axes

Answer: B

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102. Abscissas of two points P and Q are roots of the equation $x^2 + 2x - 3 = 0$ while their ordinates are roots of $y^2 + 4y - 12 = 0$. The centre of the circle with PQ as a diameter is

A. $(-1, -2)$

B. (1,2)

C. (1,-2)

D. $(-1, 2)$

Answer: A

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103. The radius of the circle

$\sqrt{1+a^2}\left(x^2+y^2\right)-2bx-2aby=0$ is

A. b

B. a pair of lines

C. ab

D. $\sqrt{1+a^2}$

Answer: A

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104. If line $3x-y+c=0$ touches circle $x^2+y^2-2x+8y-23=0$, then c =

A. 13,-27

B. $-13, 27$

C. $13, 27$

D. $-13, -27$

Answer: A

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105. Given $A \equiv (2, 4)$ and $C \equiv (4, -2)$. If ΔABC is right-angled at B, then equation of circum-circle of ΔABC is

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

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

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

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

Answer: D

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106. If $y = 2x + k$ touches $x^2 + y^2 - 4x - 2y = 0$, then k=

A. $-2, 8$

B. $2, -8$

C. $3, -7$

D. $-3, 7$

Answer: B

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107. If line $x\cos\alpha + y\sin\alpha = p$ touches circle $x^2 + y^2 = 2ax$ then p =

A. $a(1 - \sin\alpha)$

B. $a(1 - \cos\alpha)$

C. $a(1 + \sin\alpha)$

D. $a(1 + \cos\alpha)$

Answer: D

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108. If line $4x + 3y + k = 0$ touches circle $2x^2 + 2y^2 = 5x$, then k =

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

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

C. $\frac{45}{4}$

D. $\frac{-45}{4}$

Answer: D

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109. Equation of circle which touches line x = y at the origin , and passes through (2,1), is

A. $x^2 + y^2 + 5x + 5y = 0$

B. $x^2 + y^2 + 5x - 5y = 0$

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

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

Answer: C

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110. If the line $\frac{x}{a}+\frac{y}{b}=1$ touches the circle $x^2+y^2=1, \quad \text{then} \quad a^2+b^2=$

A. 1

B. a^2b^2

C. 0

D. $a+b$

Answer: B

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111. Find the equation of the circle which touches both the axes and the straight line $4x + 3y = 6$ in the first quadrant and lies below it.

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

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

C. $4\left(x^2 + y^2 - x - 6y\right) + 1 = 0$

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

Answer: D

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112. The intercet on the line y = x by the circle $x^2 + y^2 - 2x = 0$ is AB . Equation of the circle on AB as a diameter is

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

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

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

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

Answer: B

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113. Find the greatest distance of the point $P(10, 7)$ from the circle $x^2 + y^2 - 4x - 2y - 20 = 0$

A. 5

B. 10

C. 15

D. 20

Answer: C

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114. Equation of parabola with vertex (0,0) and focus (2,0) is

A. $x^2 = x$

B. $y^2 = 2x$

C. $y^2 = 4x$

D. $y^2 = 8x$

Answer: D

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115. Equation of parabola with vertex (0,0) and focus (2,0) is

A. $y^2 = 5x$

B. $y^2 = 8x$

C. $y^2 = 10x$

D. $y^2 = 15x$

Answer: B

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116. Equation of parabola with vertex (0,0) , X-axis as axis of symmetry , and passing through (2,-4), is

A. $y^2 = 2x$

B. $y^2 = 4x$

C. $y^2 = 8x$

D. $x^2 = 4y$

Answer: C

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117. Equation of parabola with focus (0,2) and directrix y + 2 = 0 is

A. $x^2 = 8y$

B. $x^2 = 2y$

C. $x^2 = 4y$

D. $y^2 = 4x$

Answer: A

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118. Equation of parabola with vertex (0,0) Y-axis ax axis of symmetry and passing through (3,-9) , is

A. $x^2 = -y$

B. $x^2 = y$

C. $x^2 = 3y$

D. $y^2 + x = 0$

Answer: A

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119. Ends of latus-rectum of parabola $3y^2 = 20x$ are

A. $\left(\pm \frac{10}{3}, \frac{5}{3} \right)$

B. $\left(\frac{5}{3}, \pm \frac{10}{3} \right)$

C. $\left(\frac{20}{3}, \pm \frac{10}{3} \right)$

D. $\left(\frac{10}{3}, \pm \frac{20}{3} \right)$

Answer: B

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120. Enda of latus-rectum of parabola $3x^2 + 8y = 0$ are

A. $\left(\pm \frac{4}{3}, \frac{-2}{3} \right)$

B. $\left(\pm \frac{2}{3}, \frac{-4}{3} \right)$

C. $\left(\pm \frac{8}{3}, \frac{-2}{3} \right)$

D. $\left(\frac{2}{3}, \pm\frac{4}{3}\right)$

Answer: A

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121. Focal distance and parameter of the point $\left(\frac{1}{2}, 2\right)$ on the parabola $y^2 = 8x$ are

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

B. $5, \frac{1}{2}$

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

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

Answer: D

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122. Focal distance and co-ordinates of the point on the parabola $y^2 = 4x$, whose parameter is - 1 , are

A. 2,(1, -2)

B. 1,(2,-2)

C. 2,(-2,1)

D. 1, (-2,2)

Answer: A

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123. If line y = x - 8 meets $y^2 = 4x$ in A and B , then length of intercept AB is

A. $2\sqrt{12}$

B. $8\sqrt{3}$

C. $12\sqrt{2}$

D. $4\sqrt{3}$

Answer: C

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124. If t is the parameter for one end of a focal chord of the parabola $y^2 = 4ax,$ then its length is :

A. $a\left(t + \frac{1}{t}\right)^2$

B. $a^2\left(t + \frac{1}{t}\right)$

C. $a\left(t - \frac{1}{t}\right)^2$

D. $a\left(t^2+1\right)$

Answer: A

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125. If P $\left(3a, 2a\sqrt{3}\right)$ is one end of a focal chord PQ of $y^2 = 4ax$ then PQ =

A. $\frac{3a}{16}$

B. $\frac{16a}{\sqrt{3}}$

C. $\frac{16a}{3}$

D. $\frac{16a^2}{3}$

Answer: C

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126. If $(x_1, y_1)$and (x_2, y_2) are ends of a focal chord of $y^2 = 4ax$, then values of x_1x_2 and y_1y_2 are (A) a^2, a^2 (B) $2a^2, a^2$ (C) $a^2, -4a^2$ (D) a, a

A. $-4a^2, a^2$

B. $a^2, 4a^2$

C. $-a^2, -4a^2$

D. $4a^2, a^2$

Answer: B

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127. If θ is the inclination of a focal chord of $y^2 = 4ax$ to its axis , then its length is

A. $4a \sin^2 \theta$

B. $4a \cos^2 \theta$

C. $4a \sec^2 \theta$

D. $4a \cos ec^2 \theta$

Answer: D

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128. If θ is the inclination of a focal chord of $y^2 = 4ax$ to its axis , then its length is

A. $4a \sin \theta \cot \theta$

B. $4a \sec\theta \tan\theta$

C. $4a \sec\theta \cot\theta$

D. $4a \sec^2\theta$

Answer: C

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129. If L and L' are ends of latus-rectum of parabola $y^2 = 4ax$ whose vertex is A , them $m\angle LAL'$ =

A. $\tan^{-1} 4$

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

C. $\tan^{-1}\sqrt{2}$

D. $2\tan^{-1} 2$

Answer: D

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130. If t is a parameter , then locus of a point

$P\left(a\sin^2 t, 2a\sin t\right)$ is

A. a line through the origin

B. a circle of radius a

C. a parabola with focus (a,0)

D. a parabola with focus (0, a)

Answer: C

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131. Equation of parabola ,having (4,-8) and (4,8) as ends of its latus-rectum , is

A. $y^2 = 8x$

B. $y^2 = 16x$

C. $y^2 = -32x$

D. $x^2 = 16y$

Answer: B

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132. Tangent to $y^2 = 4ax$ at its vertex is

A. its latus-rectum

B. X-axis

C. Y-axis

D. its directrix

Answer: C

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133. Foot of the directrix of the parabola $y^2 = 4ax$ is the point

A. (0,0)

B. (a,0)

C. (-a,0)

D. (-a,a)

Answer: C

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134. If A (x_1, y_1) and $B(x_2, y_2)$ are point on $y^2 = 4ax$, then slope of AB is

A. $\frac{x_1 - x_2}{y_1 - y_2}$

B. $\frac{4a}{x_1 + x_2}$

C. $\frac{4a}{y_1 + y_2}$

D. $\frac{4a}{x_1 - x_2}$

Answer: C

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135. If A (t_1) and $B(t_2)$ are points on $y^2 = 4ax$, then slope of AB is

A. $\frac{4a}{t_1 + t_2}$

B. $\frac{4}{t_1^2 + t_2^2}$

C. $\frac{2a}{t_1 + t_2}$

D. $\frac{2}{t_1 + t_2}$

Answer: D

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136. Points A,B ,C , D on $y^2 = 4ax$ have parameters t_1, t_2, t_3, t_4 respectively . If $AB \mid\mid CD$, then

A. $t_1 + t_3 = t_2 + t_4$

B. $t_1 + t_2 = t_3 + t_4$

C. $t_1 - t_3 = t_2 - t_4$

D. $t_1 + t_4 = t_2 - t_3$

Answer: B

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137. Points A,B,C,D, on $y^2 = 4ax$ have parameters t_1, t_2, t_3, t_4 respectively . If AB $\perp$ CD then $(t_1 + t_2)(t_3 + t_4) =$

A. 0

B. 1

C. -4

D. 4

Answer: C

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138. If PQ is a focal chord of parabola $y^2 = 4ax$ whose vertex is A , then product of slopes of AP and AQ is

A. -1

B. -4

C. 4a

D. 1

Answer: B

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139. If focal distance of a point P on $y^2 = 8x$ is 4, then P is

A. $(-2, \pm 4)$

B. $(2, \pm 4)$

C. $(4, \pm 2)$

D. $(\pm 4, 2)$

Answer: B

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140. If focal distance of point P on $y^2 = 4x$ is 6, then P is

A. $(5, \pm 2\sqrt{5})$

B. $(5, \pm \sqrt{5}$

C. $(\sqrt{5}, \pm 5)$

D. $(5, 5)$

Answer: A

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141. An equilateral triangle is inscribed in $y^2 = 8x$ so that one angular point of the triangle is at the vertex of the parabola . Length of side of this triangle is

A. $4\sqrt{3}$

B. $8\sqrt{3}$

C. $16\sqrt{3}$

D. $12\sqrt{3}$

Answer: C

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142. If (4,0) is the vertex , and Y-axis the directrix of a parabola , then its focus is

A. (8,0)

B. (4,0)

C. (0,8)

D. (0,4)

Answer: A

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143. The angle subtended by the double ordinate of length 8a of the parabola $y^2 = 4ax$ at its vertex is

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

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

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

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

Answer: B

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144. If points $\left(au^2, 2au\right)'$ and $\left(av^2, 2av\right)$ are ends of a focal chord of $y^2 = 4ax$, then

A. uv = 1

B. u + v = 0

C. u - v= 0

D. 1 + uv = 0

Answer: D

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145. A circle centred at the vertex of parabola $x^2 = 4y$ intersects it at the ends of its latus-rectum . Equation of this cirlce is

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

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

C. $x^2 + y^2 = 1$

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

Answer: A

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146. If PSQ is a focal chord of the parabola $y^2 = 8x$ such that $SP = 6$, then the length of SQ is 6 (b) 4 (c) 3 (d) none of these

A. 6

B. 4

C. 3

D. 5

Answer: C

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147. If ASB is a focal chord of a parabola such that AS = 2 and SB = 4 , then length of its latus-rectum is

A. $\frac{8}{3}$

B. $\frac{16}{3}$

C. $\frac{25}{3}$

D. $\frac{11}{3}$

Answer: B

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148. If a parabole $y^2 = 4ax$ passes through (2,-6), then its latus-rectum is

A. 9

B. 16

C. 18

D. 6

Answer: C

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149. Equation of directrix of parabola $5y^2 = 4x$ is

A. $4x - 1 = 0$

B. $4x + 1 = 0$

C. $5x + 1 = 0$

D. $5x - 1 = 0$

Answer: C

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150. The length of the latusrectum of the parbola whose focus is (3, 3) and directrix 3x-4y-2=0, is

A. 2

B. 1

C. 4

D. 3

Answer: A

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151. If (x_1, y_1) and (x_2, y_2) are ends of a chord of $y^2 = 4ax$, which cuts its axis at a distance δ from the origin , then the product x_1x_2=

A. a^2

B. δ^2

C. $a^2 + \delta^2$

D. $a^2\delta^2$

Answer: B

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152. If P(2,8) is one end of the focal chord PQ of the parabola $\left(8t^2, t16\right)$, then the mid-point of PQ is

A. (10,10)

B. (11,11)

C. (17,-12)

D. (11,-12)

Answer: C

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153. If (x_1, y_1) and (x_2, y_2) are ends of a focal chord of parabola

$3y^2 = 4x$, then $x_1x_2 + y_1y_2$ =

A. 12

B. -12

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

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

Answer: D

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154. Write the length of het chord of the parabola $y^2 = 4ax$ which passes through the vertex and in inclined to the axis at $\frac{\pi}{4}$.

A. $4a\sqrt{2}$

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

C. $2\sqrt{3}$

D. $4a\sqrt{3}$

Answer: A

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155. If the focal distance of a point on the parabola $y^2 = 8x$ is 4, then its ordinate can be

A. ± 1

B. ± 2

C. ± 3

D. ± 4

Answer: D

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156. If (4,0) is the vertex , and Y-axis the directrix of a parabola , then its focus is

A. (4,0)

B. (0,8)

C. (8,0)

D. (0,4)

Answer: C

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157. If ASB is a focal chord of a parabola such that AS = 2 and SB = 4 , then length of its latus-rectum is

A. $\frac{8}{3}$

B. $\frac{16}{3}$

C. $\frac{25}{3}$

D. $\frac{11}{3}$

Answer: B

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158. Equation of the directrix of the parabola $5y^2 = 4x$ is

A. $4x - 1 = 0$

B. $4x + 1 = 0$

C. $5x + 1 = 0$

D. $5x - 1 = 0$

Answer: C

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159. The parametric coordinates of any point on the parabola $y^2 = 4ax$ can be

A. $(-at^2, -2at)$

B. $(-at^2, 2at)$

C. $(a.\sin^2 t, -2a.\sin t)$

D. $a \cdot \sin t, -2a \cdot \cos t)$

Answer: C

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160. If PSQ is a focal chord of the parabola $y^2 = 4ax$ such that SP = 3 and SQ = 2 , find the latus rectum of the parabola .

A. $\frac{24}{5}$

B. $\frac{12}{5}$

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

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

Answer: A

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161. If PSQ is a focal chord of the parabola $y^2 = 8x$ such that $SP = 6$, then the length of SQ is 6 (b) 4 (c) 3 (d) none of these

A. 6

B. 4

C. 3

D. 2

Answer: C

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162. If the equation of a parabola is $y^2 + 12x - 4y = 32$, then its eccentricity is e =

A. -2

B. 2

C. -1

D. 1

Answer: D

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163. Distance between an end of a latus-rectum of the parabola $y^2 = 16x$ and its vertex is

A. $\sqrt{5}$

B. $3\sqrt{5}$

C. $2\sqrt{5}$

D. $4\sqrt{5}$

Answer: D

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164. Semi-axes are 3 and 2

A. $\frac{x^2}{3} + \frac{y^2}{2} = 1$

B. $\frac{x^2}{2} + \frac{y^2}{3} = 1$

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

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

Answer: C

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165. Find the equation of th ellipse, the co-ordinates of whose foci are $(\pm 3, 0)$ and eccentricity is $\frac{1}{2}$.

A. $\frac{x^2}{36} + \frac{y^2}{27} = 1$

B. $\frac{x^2}{256} + \frac{y^2}{81} = 1$

C. $\frac{x^2}{9} + \frac{y^2}{81} = 1$

D. $\frac{x^2}{9} + \frac{y^2}{81} = 1$

Answer: B

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166. Find the equation of the ellipse which passes through the points (3,1) and (2,2).

A. $3x^2 + 5y^2 = 32$

B. $5x^2 + 3y^2 = 32$

C. $\frac{x^2}{5} + \frac{y^2}{3} = 32$

D. $x^2 + y^2 = 8$

Answer: A

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167. Find the equation to the ellipse (referred to its axes as the axes of $x\ and\ y$ respectively) which passes through the point (-3,1) and has eccentricity $\sqrt{\frac{2}{5}}$

A. $5x^2 + 3y^2 = 32$

B. $\frac{x^2}{5} + \frac{y^2}{3} = 1$

C. $\frac{x^2}{3} + \frac{y^2}{5} = 1$

D. $3x^2 + 5y^2 = 32$

Answer: D

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168. Find equation of ellipse whose l(latus-rectum) = $\frac{5}{2}$ and eccentricity $y = \frac{1}{2}$

A. $12x^2 + 9y^2 = 25$

B. $9x^2 + 12y^2 = 25$

C. $\frac{x^2}{9} + \frac{y^2}{12} = 25$

D. $\frac{25x^2}{9} + \frac{25y^2}{12} = 1$

Answer: B

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169. Minor axis = 6 and one vertex at (5,0) .

A. $9x^2 + 25y^2 = 1$

B. $25x^2 + 9y^2 = 1$

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

D. $\frac{x^2}{36} + \frac{y^2}{25} = 1$

Answer: C

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170. Major axis = 3 (minor axis) and l (latus-rectum) = 2

A. $\frac{x^2}{81} + \frac{y^2}{9} = 1$

B. $9x^2 + y^2 = 81$

C. $\frac{x^2}{9} + \frac{y^2}{27} = 1$

D. $\frac{x^2}{9} + \frac{y^2}{4} = 1$

Answer: A

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171. Foci are $(\pm 3, 0)$ and vertices $(\pm 5, 0)$

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

B. $\frac{x^2}{25} + \frac{y^2}{16} = 1$

C. $\frac{x^2}{16} + \frac{y^2}{25} = 1$

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

Answer: B

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172. Find equation of ellipse whose vertices are $(\pm 3, 0)$ and passes through (2,1)

A. $5x^2 + y^2 = 9$

B. $x^2 + 9y^2 = 5$

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

D. $x^2 + 5y^2 = 9$

Answer: D

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173. Distance between foci is 6 and eccentricity is $\frac{3}{5}$

A. $\frac{x^2}{25}+\frac{y^2}{16}=1$

B. $\frac{x^2}{16}+\frac{y^2}{25}=1$

C. $16x^2+25y^2=1$

D. $25x^2+16y^2=1$

Answer: A

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174. Distance between directrices is 10 and eccentricity $\frac{1}{\sqrt{5}}$.

A. $5x^2+4y^2=1$

B. $4x^2+5y^2=1$

C. $4x^2 + 5y^2 = 20$

D. $5x^2 + 4y^2 = 20$

Answer: C

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175. Distance between foci is 4 and distance between directrices is 5

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

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

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

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

Answer: B

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176. Distance between foci is 8 and major axis is 10.

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

B. $\frac{16x^2}{25} + \frac{y^2}{4} = 1$

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

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

Answer: D

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177. Distance between directrices = $\frac{25}{2}$, minor axis = 6

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

B. $\frac{x^2}{225} + \frac{y^2}{9} = 16$

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

D. $\frac{x^2}{625} + \frac{y^2}{81} = 1$

Answer: A

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178. Distance between foci = 2 and vertices are $(\pm 2, 0)$

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

B. $4x^2 + 3y^2 = 12$

C. $3x^2 + 4y^2 = 12$

D. $\frac{x^2}{3} + \frac{y^2}{4} = 12$

Answer: C

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179. Distance between a focus and the corresponding directrix of an ellipse is 16 . If eccentricity is $\frac{3}{5}$, then lengths of its principal axes are

A. 3,4

B. 15,12

C. 12,16

D. 30,24

Answer: D

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180. An ellipse , with principal axes along co-ordinate axes has eccentricity $\frac{1}{2}$. If distance between its foci is 4 , then it passes through

A. (1,2)

B. (2,3)

C. (3,2)

D. (2,4)

Answer: B

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181. If two ellipse $E(a > b)\text{and } E(\alpha > \beta)$ have the same eccentricity , then

A. $a\alpha = b\beta$

B. $a\beta = b\alpha$

C. $ab = \alpha\beta$

D. $a + \alpha = b + \beta$

Answer: B

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182. If latus-rectum is one-third minor axis, then eccentricity of the ellipse is

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

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

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

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

Answer: C

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183. If latus-rectum $= \left(\frac{1}{2}\right)$ major axis, then e =

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

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

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

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

Answer: C

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184. If latus-rectum = semi-minor axis, then e=

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

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

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

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

Answer: A

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185. If (distance between directrices) = 3 (distance between foci) , then e =

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

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

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

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

Answer: C

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186. If m times distance between foci of an ellipse is equal to n times distance between its directrices , then

A. $m < n$

B. $m = n$

C. $m > n$

D. $m, n \in N$

Answer: C

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187. Can the distance between foci of an ellipse be equal to distance its directrices ?

A. Yes

B. No

C. May be

D. Cannot be determined

Answer: B

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188. If eccentricities of a parabola and an ellipse are e and e' respectively, then

A. ee'=1

B. $e' > e$

C. $e' < e$

D. $e' = e$

Answer: C

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189. If eccentricities of a parabola and an ellipse are e and e' respectively, then

A. $e - e' < 0$

B. $e + e' > 1$

C. $e + e' < 1$

D. $e = e'$

Answer: B

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190. Co-ordinates of a point $P\left(\frac{\pi}{3}\right)$ on the ellipse $16x^2 + 25y^2 = 400$ are

A. $\left(\frac{5}{2}, \frac{\sqrt{3}}{2}\right)$

B. $\left(\frac{\sqrt{3}}{2}, \frac{5}{2}\right)$

C. $\left(\frac{2}{5}, \frac{2}{\sqrt{3}}\right)$

D. $\left(\frac{2}{5}, 2\sqrt{3}\right)$

Answer: D

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191. foci of the ellipse x = 4 $\cos\theta$, $y = 3\sin\theta$ are

A. $(0, \pm\sqrt{7})$

B. $(\pm\sqrt{7}, 0)$

C. $(\pm 5, 0)$

D. $(0, \pm 5)$

Answer: B

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192. Focal distances of the point $P\left(5, 4\sqrt{3}\right)$ on the ellipse $64x^2 + 100y^2 = 6400$ are

A. 7,13

B. 18,2

C. 4,16

D. 19,1

Answer: A

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193. If a chord PQ , joining P (θ) Q and (ϕ) , of an ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$, subtands a right angle at its centre , then $\tan\theta \cdot \tan\phi =$

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

B. $\frac{-b^2}{a^2}$

C. $\frac{-a^2}{b^2}$

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

Answer: C

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194. If $P(\theta)$ and $Q(\phi)$ are two points on an ellipse $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$, such that chord PQ subtance a right angle at its centre 'C', then $\frac{1}{CP^2}+\frac{1}{CQ^2}$ =

A. $a+b$

B. $\frac{1}{a}+\frac{1}{b}$

C. $a^2 + b^2$

D. $\frac{1}{a^2} + \frac{1}{b^2}$

Answer: D

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195. If a chord $P_\theta Q_\phi$ of an ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ subtands a right angle at the vertex A (a,0), then

$\tan\left(\frac{\theta}{2}\right) \cdot \tan\left(\frac{\phi}{2}\right) =$

A. $\frac{-a^2}{b^2}$

B. $\frac{-b^2}{a^2}$

C. $\frac{-b^2}{a}$

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

Answer: B

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196. If $P(\theta)$ is a point on the ellipse $E(a > b)$, whose foci are S and S', then $SP.\ S'P =$

A. $a^2 \cos^2 \theta + b^2 \sin^2 \theta$

B. $a^2 \cos^2 \theta - b^2 \sin^2 \theta$

C. $a^2 \sin^2 \theta - b^2 \cos^2 \theta$

D. $a^2 \sin^2 \theta + b^2 \cos^2 \theta$

Answer: D

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197. An ellipse , centred at the origin , has eccentricity $\frac{1}{2}$ and one directrix d :x = 16 . If P : x = - 4 is a point on this ellipse , then SP =

A. 8

B. 9

C. 10

D. -32

Answer: C

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198. If distance between foci of an ellipse equals its latus-rectrum , then its eccentricity is

A. $\frac{1-\sqrt{5}}{2}$

B. $\frac{1+\sqrt{5}}{2}$

C. $\frac{\sqrt{5-1}}{2}$

D. None of these

Answer: D

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199. Find the sum of the focal distances of any point on the ellipse $9x^2 + 16y^2 = 144$.

A. 32

B. 18

C. 16

D. 8

Answer: D

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200. If $P = (x, y), F_1 = (3, 0), F_2 = (-3, 0),$ and $16x^2 + 25y^2 = 400$, then $PF_1 + PF_2$ equal 8 (b) 6 (c) 10 (d) 12

A. 8

B. 6

C. 10

D. 12

Answer: C

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

A. 4

B. 3

C. $\sqrt{12}$

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

Answer: A

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202. In an ellipse, the distances between its foci is 6 and minor axis is 8. Then its eccentricity is

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

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

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

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

Answer: C

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203. For the ellipse $25x^2 + 45y^2 = 9$,

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

B. latus-rectum is $\frac{5}{3}$

C. foci are $\left(\frac{\pm 3}{5}, 0\right)$

D. eccentricity = latus-rectum

Answer: D

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204. S and T are foci of an ellipse and B is an end of the minor axis , if STB is an equilateral triangle , the eccentricity of the ellipse , is

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

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

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

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

Answer: C

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205. Any point whose x and y co-ordinates satisfy the equations $\frac{1-(x/a)}{t^2} = \frac{1+(x/a)}{1} = \frac{y/b}{t}$, where t is an non-zero parameter, lies on a/m

A. circle

B. parabola

C. ellipse

D. hyperbola

Answer: C

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206. Given $A \equiv (0, -1)$ and $B = (0, 1)$. If P (x,y) is a point satisfying the condition $4x^2 + 3y^2 = 12$, then PA + PB =

A. 3

B. 4

C. 6

D. None of these

Answer: B

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207. For the ellipse $\frac{x^2}{4} + \frac{y^2}{3} = 1$, the ends of the two latus rectum are the four points

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

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

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

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

Answer: A

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208. If the equation $\frac{x^2}{16 - K} + \frac{y^2}{5 - K} = 1$ represents an ellipse , then

A. $K > 5$

B. $K > 16$

C. $K < 5$

D. $5 < K < 16$

Answer: C

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209. Perimeter of a triangle formed by any point on the ellipse $\frac{x^2}{25} + \frac{y^2}{16} = 1$ and its foci is

A. 13

B. 14

C. 15

D. 16

Answer: D

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210. If P is any point on the ellipse $\frac{x^2}{25} + \frac{y^2}{9} = 1$ whose foci are S and S' perimeter of $\Delta SPS'$ is

A. 18

B. 50

C. 34

D. 9

Answer: A

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211. If $a^2 + b^2 = 25$ and a focus of the ellipse $\frac{x^2}{a^2+3} + \frac{y^2}{b^2+3} = 1$ is $(\sqrt{7}, 0)$, then equation of this ellipse is

A. $\frac{x^2}{20} + \frac{y^2}{13} = 1$

B. $\frac{x^2}{12} + \frac{y^2}{19} = 1$

C. $\frac{x^2}{19} + \frac{y^2}{12} = 1$

D. $\frac{x^2}{13} + \frac{y^2}{20} = 1$

Answer: C

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212. S and T are foci of an ellipse and B is an end of the minor axis, if STB is an equilateral triangle, the eccentricity of the ellipse, is

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

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

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

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

Answer: C

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213. If the lines joining the foci of an ellipse to an end of its minor axis are at right angles , then the eccentricity of the ellipse is e =

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

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

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

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

Answer: B

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214. P and Q are two points on ellipse $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$ such the PQ passes through centre of ellipse . If R is any point on the ellipse , other then P and Q , then product of slopes of chords PR and QR is .

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

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

C. $-\frac{a^2}{b^2}$

D. $-\frac{b^2}{a^2}$

Answer: D

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215. The eccentricity of the ellipse which meets the straight line $\frac{x}{7}+\frac{y}{2}1$ on the x- axis and the straight line $\frac{x}{3}-\frac{y}{5}=1$ on the y-axis and whose axis lie along the axis of coordinate

A. $\frac{3\sqrt{2}}{7}$

B. $\frac{2\sqrt{3}}{7}$

C. $\frac{\sqrt{3}}{7}$

D. $\frac{2\sqrt{6}}{7}$

Answer: D

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216. Find the area of the greatest rectangle that can be inscribed in an ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$

A. $\sqrt{ab}$

B. a/b

C. $2ab$

D. πab

Answer: A

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217. An arc of a bridge is semi-elliptical with the major axis horizontal. If the length of the base is 9m and the highest part of the bridge is 3m from the horizontal, then prove that the best approximation of the height of the acr 2 m from the center of the base is $\frac{8}{3}m$.

A. $\frac{11}{4}m$

B. $\frac{8}{3}m$

C. $\frac{7}{2}m$

D. $2m$

Answer: C

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218. The equation of the ellipse whose centre is at origin and which passes through the points (-3,1) and (2,-2) is

A. $5x^2 + 3y^2 = 32$

B. $3x^2 + 5y^2 = 32$

C. $5x^2 - 3y^2 = 32$

D. $3x^2 + 5y^2 + 32 = 0$

Answer: B

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219. If the foci and vetrices of an ellipse be $(\pm 1, 0)$ and $(\pm 2, 0)$, then the minor axis of the ellipse is

A. $2\sqrt{5}$

B. 2

C. 4

D. $2\sqrt{3}$

Answer: D

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220. The equation of the directrice of the ellipse $16x^2 + 25y^2 = 400$ are

A. $2x = \pm 25$

B. $5x = \pm 9$

C. $3x = \pm 10$

D. none of these

Answer: D

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221. The latus rectum of an ellipse is 10 and the minor axis Is equal to the distnace betweent the foci. The equation of the ellipse is

A. $x^2 + 2y^2 = 100$

B. $x^2 + y^2\sqrt{2} = 100$

C. $x^2 = 2y^2 = 100$

D. none of these

Answer: A

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

A. 8

B. 12

C. 18

D. 24

Answer: C

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223. The distnce between the foci of the ellipse $3x^2 + 4y^2 = 48$ is

A. 2

B. 4

C. 6

D. 8

Answer: B

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224. Foci of an ellipse are $(\pm 5, 0)$ and one of its directrices is $5x = 36$. Then its equation is

A. $\frac{x^2}{36} + \frac{y^2}{11} = 1$

B. $\frac{x^2}{6} + \frac{y^2}{\sqrt{11}} = 1$

C. $\frac{x^2}{6} + \frac{y^2}{11} = 1$

D. none of these

Answer: A

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225. If the eccentricity of an ellipse be $\frac{1}{\sqrt{2}}$, then its latus rectum is equal to its

A. minor axis

B. semi-minor axis

C. major axis

D. semi-major axis

Answer: D

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226. For each point (a, y) on an ellipse, the sum of the distances from (x, y) to the points $(2, 0)$ and $(-2, 0)$ is 8. Then the positive value of x so that (x,3) lies on the ellipse is

A. 2

B. $2\sqrt{3}$

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

D. 4

Answer: A

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227. If the centre, one of the foci and semi-major axis of an ellipse are (0,0), (0,3) and 5, then its equation is

A. $\frac{x^2}{16}+\frac{y^2}{25}=1$

B. $\frac{x^2}{25}+\frac{y^2}{16}=1$

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

D. none of these

Answer: A

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228. If one vertex of an ellipse is (0,7) and the corresponding directrix is y = 12 , then the equation of the ellipse is

A. $95x^2+144y^2=4655$

B. $144x^2 + 95y^2 = 4655$

C. $95x^2 + 144y^2 = 13680$

D. none of these

Answer: B

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229. Equation of ellipse having letus rectum 8 and eccentricity $\frac{1}{\sqrt{2}}$ is

A. $\frac{x^2}{18} + \frac{y^2}{32} = 1$

B. $\frac{x^2}{8} + \frac{y^2}{9} = 1$

C. $\frac{x^2}{64} + \frac{y^2}{32} = 1$

D. $\frac{x^2}{16} + \frac{y^2}{24} = 1$

Answer: C

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230. Ellipse $x^2 + 4y^2 = 4$ is inscribed in a rectangle aligned with co-ordinate axes . This rectangle itself is inscribed in another ellipse the passes ellipse that through (-4,0) . Then the equation of the ellipse is

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

B. $x^2 + 12y^2 = 16$

C. $4x^2 + 48y^2 = 48$

D. $4x^2 + 64y^2 = 48$

Answer: B

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231. Equation $\frac{x^2}{r-2}+\frac{y^2}{5-r}=1$ represents an ellipse if

A. $r>2$

B. $2<r<5$

C. $r>5$

D. none of these

Answer: B

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232. The eccentricity of an ellipse with its centre at the origin is $\frac{1}{2}$. If one of the directrices is x = 4 , then the equation of ellipse is

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

B. $3x^2 + 4y^2 = 12$

C. $4x^2 + 3y^2 = 1$

D. $4x^2 + 3y^2 = 12$

Answer: B

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233. The distanve between the foci of an ellipse is 16 and eccentricity is $\frac{1}{2}$. Length of the major axis of the cellipse is

A. 8

B. 64

C. 16

D. 32

Answer: D

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234. If the eccentricities of the two ellipse $\frac{x^2}{169}+\frac{y^2}{25}=1$ and $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$ and equal , then the value $\frac{a}{b}$, is

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

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

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

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

Answer: C

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235. In the ellipse $9x^2 + 5y^2 = 45$, distance between the foci is

A. $4\sqrt{5}$

B. $3\sqrt{5}$

C. 3

D. 4

Answer: D

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236. If the distance foci of an ellipse is 8 and distance between its directrices is 18 , then the equation of the ellipse is

A. $5x^2 - 9y^2 = 180$

B. $9x^2 + 5y^2 = 180$

C. $x^2 + 9y^2 = 180$

D. $5x^2 + 9y^2 = 180$

Answer: D

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237. Find the equation of the hyperbola whole transverse and conjugate axes are 8 and 6 respectively.

A. $16x^2 - 9y^2 = 1$

B. $\frac{x^2}{9} - \frac{y^2}{16} = 1$

C. $9x^2 - 16y^2 = 1$

D. $\frac{x^2}{16} - \frac{y^2}{9} = 1$

Answer: D

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238. Find the equation of hyperbola where, conjugate axis is 3 along Y-axis and distance between foci is 5.

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

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

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

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

Answer: B

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239. The length of the transverse axis of a hyperbola is 7 and it passes through the point $(5, -2)$. The equation of the hyperbola is

A. $\frac{x^2}{49} - \frac{y^2}{196} = 1$

B. $\frac{y^2}{196} - \frac{x^2}{49} = 1$

C. $\frac{4x^2}{7} - \frac{51y^2}{196} = 1$

D. $4x^2 - 357y^2 = 196$

Answer: C

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240. One focus at (4,0) corresponding directrix x = 1 .

A. $4x^2 - 12y^2 = 1$

B. $125x^2 - 100y^2 = 9$

C. $9x^2 - 9y^2 = 100$

D. $3x^2 - y^2 = 12$

Answer: D

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241. Distance between foci = 10 and eccentricity = $\frac{3}{2}$

A. $\frac{9x^2}{100} - \frac{9y^2}{125} = 1$

B. $125x^2 - 100y^2 = 9$

C. $9x^2 - 9y^2 = 100$

D. $100x^2 - 125y^2 = 9$

Answer: A

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242. Conjugate axis = 10 and eccentricity = $\frac{6}{5}$

A. $4x^2 - 25y^2 = 1$

B. $4x^2 - 25y^2 = -1$

C. $\frac{x^2}{25} - \frac{y^2}{11} = 1$

D. $4x^2 - 25y^2 = 100$

Answer: C

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243. One focus at (3,0) and eccentricity = $\frac{6}{5}$

A. $\frac{4x^2}{25} - \frac{4y^2}{11} = 1$

B. $36x^2 - 4y^2 = 2475$

C. $36x^2 - 4y^2 - 9$

D. $9x^2 - 36y^2 = 25$

Answer: A

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244. Find the equation of hyperbola whose conjugate axis = latus-rectum = 8 ,

A. $16x^2 - 16y^2 = 1$

B. $16x^2 - 16y^2 = -1$

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

D. $8x^2 - 8y^2 = 1$

Answer: C

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245. $e = \frac{3}{2}$ and distance between directrices $= \frac{8}{3}$

A. $4x^2 - 5y^2 = 1$

B. $\frac{x^2}{4} - \frac{y^2}{5} = 1$

C. $\frac{x^2}{5} - \frac{y^2}{4} = 1$

D. $4x^2 - 5y^2 = 20$

Answer: B

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246. Equation of the hyperbola in standard form which passes through the points $(6, 9)$ and $(3, 0)$ is

A. $3x^2 - y^2 = 27$

B. $\frac{x^2}{27} - \frac{y^2}{3} = 1$

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

D. $27x^2 - 3y^2 = 9$

Answer: A

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247. Find the equation of hyperbola whose eccentricity $= \sqrt{2}$ and passing through (-5,3) .

A. $16x^2 - 16y^2 = 1$

B. $16x^2 - 16y^2 = -1$

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

D. $4x^2 - 4y^2 = 1$

Answer: C

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248. Eccentricity and latus-rectum of $x^2 - 3y^2 = 36$ are

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

B. $\frac{2}{\sqrt{3}}, 4$

C. $\frac{4}{\sqrt{3}}, 9$

D. $\frac{5}{\sqrt{3}}, 9$

Answer: B

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249. For hyperbola, If transverse axis = conjugate axis , then e =

A. 0

B. 1

C. 2

D. $\sqrt{2}$

Answer: D

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250. If transverse axis = 2 (latus-rectum), then e =

A. $\sqrt{2}$

B. $\sqrt{3}$

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

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

Answer: C

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251. If conjugate axis = 2 (latus-rectum), then e =

A. 2

B. $\sqrt{5}$

C. $\sqrt{5}$

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

Answer: D

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252. If distance between foci = 3 (distance between directrices) . Then e =

A. 2

B. $\sqrt{2}$

C. 3

D. $\sqrt{3}$

Answer: D

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253. Focus of the parabola $y^2 = 8x$ is a vertex of a hyperbola whose conjuagate axis is 4 . Eccentricity of this hyperbola is

A. 2

B. $\sqrt{2}$

C. 3

D. $\sqrt{3}$

Answer: B

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254. Co-ordinates of point $P\left(\frac{\pi}{4}\right)$ on the hyperbola $25x^2 - 9y^2 = 225$ are

A. $\left(3\sqrt{2}, 5\right)$

B. $\left(2\sqrt{3}, 5\right)$

C. $\left(3, 5\sqrt{2}\right)$

D. $\left(\sqrt{2}, 15\right)$

Answer: A

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255. Focal distances of a point P : x = 13 on 13 on $81x^2 - 144y^2 = 11664$ are

A. $\frac{38}{3}, \frac{92}{3}$

B. 13, 117

C. 71 , 311

D. $\frac{17}{4}, \frac{113}{4}$

Answer: D

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256. If $P(\theta)$ is a point on the hyperbola $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$, whose foci are S and S', then $SP.S'P =$

A. $a^2 \sec^2\theta + b^2 \tan^2\theta$

B. $a^2 \sec^2\theta - b^2 \tan^2\theta$

C. $a^2 \tan^2\theta - b^2 \sec^2\theta$

D. $a^2 \tan^2\theta + b^2 \sec^2\theta$

Answer: D

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257. The length intercepted by the hyperbola $x^2 - 4y^2 = 1$ on the line x - 3y = 1 is

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

B. $\frac{3}{5}\sqrt{10}$

C. $\frac{6}{5}\sqrt{10}$

D. None of these

Answer: C

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258. If $eande'$ the eccentricities of a hyperbola and its conjugate, prove that $\frac{1}{e^2}+\frac{1}{e'^2}=1.$

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

B. $\frac{1}{e_1^2}-\frac{1}{e_2^2}=1$

C. $\frac{1}{e_1^2}+\frac{1}{e_2^2}=1$

D. $e_1^2-e_2^2=1$

Answer: C

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259. The eccentricity of the conjugate hyperbola of the hyperbola $x^2-3y^2=1$ is 2 (b) $2\sqrt{3}$ (c) 4 (d) $\frac{4}{5}$

A. 2

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

C. 4

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

Answer: A

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260. If the equation $4x^2 + ky^2 = 18$ respresents a hyperbola whose eccentricity is $\sqrt{2}$, then k =

A. 4

B. -4

C. 3

D. -3

Answer: B

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261. The eccentricity of the hyperbola $\frac{\sqrt{2006}}{4}\left(x^2 - y^2\right) = 1$ is

A. $\sqrt{2}$

B. 2

C. $2\sqrt{2}$

D. $\sqrt{3}$

Answer: A

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262. If e_1, e_2 and e_3 the eccentricities of a parabola , and ellipse and a hyperbola respectively , then

A. $e_1 < e_2 < e_3$

B. $e_1 < e_3 < e_2$

C. $e_3 < e_1 < e_2$

D. $e_2 < e_1 < e_3$

Answer: D

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263. If e_1 be the eccentricity of a hyperbola and e_2 be the eccentricity of its conjugate, then show that the point $\left(\frac{1}{e_1}, \frac{1}{e_2}\right)$ lies on the circle $x^2 + y^2 = 1$.

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

B. $x^2 + y^2 = 1$

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

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

Answer: B

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264. If t is a non-zero parameter , then the locus of the point of intersection of the lines $\frac{x}{a} + \frac{y}{b} = t$ and $\frac{x}{a} - \frac{y}{b} = \frac{1}{t}$ is

A. a circle

B. an ellipse

C. a hyperbola

D. a parabola

Answer: C

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265. The locus represented by $x = \frac{a}{2}\left(t + \frac{1}{t}\right), y = \frac{a}{2}\left(t - \frac{1}{t}\right)$ is

A. circle

B. parabola

C. ellipse

D. hyperbola

Answer: D

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266. A hyperbola, centred at the prigin, has transverse axis 2a. If it passes through a given point (x_1, y_1), then its eccentricity is

A. $\sqrt{\frac{x_1^2 - y_1^2 - a^2}{x_1^2 - x_1^2}}$

B. $\sqrt{\frac{x^2 - x_1^2 - y_1^2}{x^2 - a_1^2}}$

C. $\sqrt{\frac{a^2 + x_1^2 + y_1^2}{a^2 - x_1^2}}$

D. $\sqrt{a^2 - \frac{y_1^2}{x_1^2}}$

Answer: B

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267. For the hyperbola $\frac{x^2}{\cos^2\alpha} - \frac{y^2}{\sin^2\alpha} = 1$, where α is a parameter, which of the following remains constant ?

A. abscissa of vertices

B. abscissa of foci

C. eccentricity

D. directrix

Answer: B

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268. Point P, Q and R on the hyperbola $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$ are such that line PQ passes through the centre of the hyperbola .

Then product of slopes of PR and QR is

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

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

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

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

Answer: C

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269. The equation of the conic with focus at $(1, -1)$, directrix along $x - y + 1 = 0$ and with eccentricity $\sqrt{2}$, is

A. $x^2 - y^2 = 1$

B. $xy = 1$

C. $2xy - 4x + 4y + 1 = 0$

D. $2xy + 4x - 4y - 1 = 0$

Answer: C

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270. The equation $x = \frac{e^t + e^{-t}}{2}, y = \frac{e^t - e^{-t}}{2}, t \in R,$ represents

A. a parabola

B. an ellipse

C. a hyperbola

D. a circle

Answer: C

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271. Locus of the point of intersection of the lines

$mx\sqrt{3} + my - 4\sqrt{3} = 0$ and

$x\sqrt{3} - y - 4m\sqrt{3} = 0$, where m is parameter , is

A. a parabola

B. a hyperbola with e = 2

C. an ellipse with $e = \frac{2}{3}$

D. a circle

Answer: B

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272. Write the equation of the hyperbola whose vertices are $(\pm 3, 0)$ and foci at $(\pm 5, 0)$

A. $16x^2 - 9y^2 = 144$

B. $9x^2 - 16y^2 = 144$

C. $25x^2 - 9y^2 = 225$

D. $9x^2 - 25y^2 = 81$

Answer: A

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273. If the eccentricity of the hyperbola $x^2 - y^2(\sec)\alpha = 5$ is $\sqrt{3}$ times the eccentricity of the ellipse $x^2(\sec)^2\alpha + y^2 = 25$, then a value of α is : (a) $\frac{\pi}{6}$ (b) $\frac{\pi}{4}$ (c) $\frac{\pi}{3}$ (d) $\frac{\pi}{2}$

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

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

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

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

Answer: B

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274. Standard equation of the hyperbola having distance between foci to 32 , and eccentricity $2\sqrt{2}$, is

A. $7x^2 - y^2 = 56$

B. $x^2 - 7y^2 = 56$

C. $7x^2 - y^2 = 224$

D. $x^2 - 7y^2 = 224$

Answer: C

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275. If $0 < \alpha < \frac{\pi}{2}$ and the eccentricity of the ellipse $x^2 \tan^2 \alpha + y^2 \sec^2 \alpha = 1 is 1/2$, then α

A. $\frac{\pi}{12}$

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

C. $\frac{5\pi}{12}$

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

Answer: D

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276. If P is a point on the hyperbola $16x^2 - 9y^2 = 144$ whose foci are S_1 and S_2 then : $|S_1P - S_2P| =$

A. 4

B. 6

C. 8

D. 12

Answer: B

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277. If the latus rectum of an hyperbola be 8 and eccentricity be $\frac{3}{\sqrt{5}}$ the the equation of the hyperbola is

A. $4x^2 - 5y^2 = 100$

B. $5x^2 - 4y^2 = 100$

C. $4x^2 + 5y^2 = 100$

D. $5x^2 + 4y^2 = 100$

Answer: A

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278. Eccentricity of the hyperbola passing through (3,0) and $(3\sqrt{2}, 2)$ is

A. $\sqrt{13}$

B. $\frac{\sqrt{13}}{3}$

C. $\frac{\sqrt{13}}{4}$

D. $\frac{\sqrt{13}}{2}$

Answer: B

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279. Find the equation of the hyperbola whose conjugate axis is 5 and the distance between the foci is 13.

A. $25x^2 - 144y^2 = 900$

B. $144y^2 - 25y^2 = 900$

C. $25x^2 + 144y^2 = 900$

D. $144x^2 + 25y^2 = 900$

Answer: A

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280. The length of the transverse axis of a hyperbola is 7 and it passes through the point $(5, -2)$. The equation of the hyperbola is

A. $\frac{4}{49}x^2 - \frac{196}{51}y^2 = 1$

B. $\frac{49}{4}x^2 - \frac{51}{196}y^2 = 1$

C. $\frac{4}{49}x^2 - \frac{51}{196}y^2 = 1$

D. none of these

Answer: C

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281. If $(4, 0)$ and $(-4, 0)$ be the vertices and $(6, 0)$ and $(-6, 0)$ be the foci of a hyperbola, then its eccentricity is

A. $5/2$

B. 2

C. $3/2$

D. $\sqrt{2}$

Answer: C

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282. If $(0, \pm 4)$ and $(0, \pm 2)$ are respectively the foci and vertices of a hyperbola , then its equation is

A. $\frac{x^2}{4} - \frac{y^2}{12} = 1$

B. $\frac{x^2}{12} - \frac{y^2}{4} = 1$

C. $\frac{y^2}{4} - \frac{x^2}{12} = 1$

D. $\frac{y^2}{12} - \frac{x^2}{4} = 1$

Answer: C

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283. Eccentricity of the a hyperbola can never be equal to

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

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

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

D. 2

Answer: B

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284. A hyperbola passes through (3,2) and (-17, 12) and has its centre at origin and transverse axis along X-axis . Then length of its transverse axis is

A. 2

B. 4

C. 6

D. none of these

Answer: A

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285. Equation of hyperbola is standard from having latus rectum = 9 and eccentricity = 5/4 is

A. $\frac{x^2}{16} - \frac{y^2}{18} = 1$

B. $\frac{x^2}{36} - \frac{y^2}{27} = 1$

C. $\frac{x^2}{64} - \frac{y^2}{36} = 1$

D. $\frac{x^2}{36} - \frac{y^2}{64} = 1$

Answer: C

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286. Distance between foci of a hyperbola is double the distance between its vertices . If the length of its conjugate axis is 6, then equation is

A. $3x^2 - y^2 = 3$

B. $x^2 - 3y^2 = 3$

C. $3x^2 - y^2 = 9$

D. $x^2 - 3y^2 = 9$

Answer: C

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287. The equation to the hyperbola having its eccentricity 2 and the distance between its foci is 8 is

A. $\frac{x^2}{12} - \frac{y^2}{4} = 1$

B. $\frac{x^2}{4} - \frac{y^2}{12} = 1$

C. $\frac{x^2}{8} - \frac{y^2}{2} = 1$

D. $\frac{x^2}{16} - \frac{y^2}{9} = 1$

Answer: B

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288. If the distance between the foci and the distance between the two directricies of the hyperbola $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$ are in the ratio 3:2, then $b : a$ is $1 : \sqrt{2}$ (b) $\sqrt{3} : \sqrt{2}$ $1 : 2$ (d) $2 : 1$

A. $\sqrt{2} : 1$

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

C. $1 : 2$

D. $2 : 1$

Answer: A

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289. The distance between the directices of the hyperboltic $x = 8\sec\theta, y = 8\tan\theta is$

A. $16\sqrt{2}$

B. $\sqrt{2}$

C. $8\sqrt{2}$

D. $4\sqrt{2}$

Answer: C

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MISCELLANEOUS MCQs

1. If the equation

$$ax^2 + by^2 + (a + b - 4)xy - ax - by - 20 = 0$$

represents a circle , then its radius is

A. $\frac{\sqrt{21}}{2}$

B. $\frac{\sqrt{42}}{2}$

C. $2\sqrt{21}$

D. $\sqrt{22}$

Answer: B

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

A. neither of the two axes

B. X-axis

C. both of the two axes

D. Y-axis

Answer: D

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3. If the circles of same radius a and centres (2,3), (5,6) cut orthogonally , then a=

A. $2\sqrt{2}$

B. 3

C. 4

D. none of these

Answer: B

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4. If the equation

$$a^2x^2 + (a^2 - 5a + 4)xy + (3a - 2)y^2 - 8x + 12y - 4 = 0$$

represents a circle , then : a =

A. 1

B. 4

C. 2

D. none of these

Answer: A

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5. The $(x - x_1)(x - x_2) + (y - y_1)(y - y_2 = 0$ represents a circle whose centre is

A. $\left(\frac{x_1 - x_2}{2}, \frac{y_1 - y_2}{2}\right)$

B. $\left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right)$

C. (x_1, y_2)

D. (x_2, y_1)

Answer: B

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6. Two circles with centres at C_1, C_2 and having radii r_1, r_2 will intersect each in two real distinct points if , and only if :

A. $l(C_1C_2) < r_1 + r_2$

B. $l(C_1C_2) - |r_1 - r_2|$

C. $|r_1 - r_2| < l(C_1C_2) < r_1 + r_2$

D. none of these

Answer: C

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7. If the two circles $x^2 + y^2 + ax = 0$ and $x^2 + y^2 = c^2$, where $a, c > 0$, touch each other intenally, then :

A. c = a

B. c = 2a

C. $c = a/2$

D. none of these

Answer: A

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8. If the line $x + 2by + 7 = 0$ is a diameter of the circle $x^2 + y^2 - 6x + 2y = 0$, then : b =

A. 3

B. -5

C. -1

D. 5

Answer: D

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9. If the circle $x^2 + y^2 - kx - 12y + 4 = 0$ touches the X-axis then : k =

A. $\sqrt{12}$

B. 12

C. $\sqrt{16}$

D. 16

Answer: C

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10. The equation of the circle which touches both axes and whose centre is (x_1, y_1) is

A. $x^2 + y^2 + 2x_1(x + y) + x_1^2 = 0$

B. $x^2 + y^2 - 2x_1(x + y) + x_1^2 = 0$

C. $x^2 + y^2 = x_1^2 + y_1^2$

D. $x^2 + y^2 + 2xx_1 + 2yy_1 = 0$

Answer: B

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11. A circle touches the y-axis at the point (0, 4) and cuts the x-axis in a chord of length 6 units. Then find the radius of the circle.

A. 3

B. 4

C. 5

D. 6

Answer: C

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12. Centre of the circle

$(x - x_1)(x - x_2) + (y - y_1)(y - y_2) = 0$ is

A. $\left(\frac{x_1 + y_1}{2}, \frac{x_1 + y_2}{2}\right)$

B. $\left(\frac{x_1 - y_1}{2}, \frac{x_2 - y_2}{2}\right)$

C. $\left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right)$

D. $\left(\frac{x_1 - x_2}{2}, \frac{y_1 - y_2}{2}\right)$

Answer: C

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13. ΔABC is right angled at C . If $A \equiv (-3, 4)$ and $B \equiv (3, 4)$ then equation of circumcircle of ΔABC is

A. $x^2 + y^2 - 6x + 8y = 0$

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

C. $x^2 + y^2 - 3x + 4y + 5 = 0$

D. none of these

Answer: B

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14. If the equation ,

$px^2 + (2 - q)xy + 3y^2 - 6qx + 30y + 6y = 0$

represents a circle , then : (p,q) $\equiv$

A. $(3, 1)$

B. $(2, 2)$

C. $(3, 2)$

D. $(3, 4)$

Answer: C

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15. Circle $x^2 + y^2 + 6y = 0$ touches

A. X-axis at the origin

B. Y-axis at the origin

C. X-axis at (3,0)

D. the line y + 3 = 0

Answer: A

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16. Equation of the circle with centre at (1,-2) , and passing through the centre of the circle $x^2 + y^2 + 2y - 3 = 0$, is

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

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

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

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

Answer: A

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17. Equation of the circle concentric with the circle $x^2 + y^2 + 8x + 10y - 7 = 0$, and passing through the centre of the circle $x^2 + y^2 - 4x - 6y = 0$,is

A. $x^2 + y^2 + 8x + 10y + 59 = 0$

B. $x^2 + y^2 + 8x + 10y - 59 = 0$

C. $x^2 + y^2 - 4x - 6y + 87 = 0$

D. $x^2 + y^2 - 4x - 6y - 87 = 0$

Answer: B

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18. Equation of the circle passing through the three points

(0, 0) , (0,b) and (a,b) is

A. $x^2 + y^2 + ax + by = 0$

B. $x^2 + y^2 - 6x + 12y - 15 = 0$

C. $x^2 + y^2 - ax - by = 0$

D. $x^2 + y^2 - 6x + 12y + 45 = 0$

Answer: C

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19. A circle is concentric with the circle

$x^2 + y^2 - 6x + 12y + 15 = 0$

and has area double of its area. Its equation is

A. $x^2 + y^2 - 6x + 12y - 15 = 0$

B. $x^2 + y^2 - 6x + 12y + 15 = 0$

C. $x^2 + y^2 - 6x + 12y + 45 = 0$

D. none of these

Answer: A

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20. Equation of the circle with centre on the X-axis , radius 4 , and passing through the origin , is

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

B. $x^2 + y^2 - 8y = 0$

C. $x^2 + y^2 \pm 8x = 0$

D. $x^2 + y^2 + 8y = 0$

Answer: C

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21. the equation of the circle passing through the point $(2, 1)$ and touching y-axis at the origin is

A. $x^2 + y^2 - 5x = 0$

B. $2x^2 + 2y^2 - 5x = 0$

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

D. none of these

Answer: B

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22. Equation of the circle which passes through the origin and cuts off intercepts of length 2 units from negative co-ordinate axes , is

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

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

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

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

Answer: C

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23. If the radius of the circel $x^2 + y^2 + 2gx + 2fy + c = 0$ be r, then it will touch both the axes, if

A. $g = f = r$

B. $g = f = c = r$

C. $g = f = \sqrt{c} = r$

D. g = f and $c^2 = r$

Answer: C

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24. Equation of the circle with centre on X-axis , radius 5, and passing through (2,3) , is

A. $x^2 + y^2 + 4x - 21 = 0$

B. $x^2 + y^2 - 4x - 21 = 0$

C. $x^2 + y^2 - 4x - 21 = 0$

D. $x^2 + y^2 + 5x - 21 = 0$

Answer: A

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25. The equation of the circel which touches X-axis at $(3, 0)$ and passes through $(1, 4)$ is given by

A. $x^2 + y^2 - 6x - 5y + 9 = 0$

B. $x^2 + y^2 + 6x + 5y = 0$

C. $x^2 + y^2 - 6x + 5y - 9 = 0$

D. $x^2 + y^2 + 6x - 5y + 9 = 0$

Answer: A

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26. The equation $ax^2 + 2bxy + 2y^2 + 2x - y + c = 0$ represents a circle through the origin , if

A. a = 0, b= 0 ,c = 2

B. a= 1, b = 0 , c = 0

C. a= 2, b= 2, c= 0

D. a = 2, b= 0 , c= 0

Answer: D

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27. Equation of the circle , centred at the origin , whose radius equals the distance between the lines x = -1 and x = 1 , is

A. $x^2 + y^2 = 1$

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

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

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

Answer: C

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28. If the equation of a circle which touches the line x = y at the origin , and passes through (2,1) is

$x^2 + y^2 + px + qy = 0$, then : (p,q) $\equiv$

A. (5,-5)

B. (-4,4)

C. (4,-4)

D. (-5,5)

Answer: D

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29. A circle $x^2 + y^2 + 2gx + 2fy + c = 0$ passing through $(4, -2)$ is concentric to the circle $x^2 + y^2 - 2x + 4y + 20 = 0,$ then the value of c will be

A. x= 1

B. 4

C. 0

D. 1

Answer: A

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30. If the equation $x^2 + y^2 + 2gx + 2fy + c = 0$ represents a circle with X-axis as a diameter , and radius a, then :

A. $f = 2a, g = 0, c = 3a^2$

B. $f = 0, g = a, c = 3a^2$

C. $f = 0, g = -2a, c = 3a^2$

D. none of these

Answer: C

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31. Equation of the circle with centre (-4,3), and touching the circle $x^2 + y^2 = 1$, is

A. $x^2 + y^2 + 8x - 6y + 9 = 0$

B. $x^2 + y^2 + 8x + 6y - 11 = 0$

C. $x^2 + y^2 + 8x + 6y + 9 = 0$

D. none of these

Answer: A

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32. Equation of the circle concentric with the circle $x^2 + y^2 - 4x - 6y - 3 = 0$, and touching Y-axis , is

A. $x^2 + y^2 - 4x - 6y - 9 = 0$

B. $x^2 + y^2 - 4x - 6y + 9 = 0$

C. $x^2 + y^2 - 4x - 6y + 3 = 0$

D. none of these

Answer: B

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33. Radius of the circle $x^2 + y^2 + 2x\cos\theta + 2y\sin\theta - 8 = 0$, is

A. 1

B. 3

C. $2\sqrt{3}$

D. $\sqrt{10}$

Answer: B

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34. If the equation $\frac{K(x+1)^2}{3} + \frac{(y+2)^2}{4} = 1$represents a ciecle, then K =

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

B. 1

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

D. 12

Answer: A

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35. The focus of the parabola $4y^2 + 12x - 20y + 67 = 0$ is

A. $(-7/2, 5/2)$

B. $(-3/4, 5/2)$

C. $(-17/4, 5/2)$

D. $(5/2, -3/4)$

Answer: C

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36. The equation of the directirx of the parabola $y^2 + 4y + 4x + 2 = 0$ is

A. $x = 1$

B. $x = -1$

C. $x = -3/2$

D. $x = 3/2$

Answer: D

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37. If the focus of a parabola divides a focal chord in segments of lengths 3 and 2 , then the length of its latus rectum is

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

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

C. $\frac{12}{5}$

D. $\frac{24}{5}$

Answer: D

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38. If (4,0) is the vertex , and Y-axis the directrix of a parabola , then its focus is

A. (8,0)

B. (4,0)

C. (0,8)

D. (0,4)

Answer: A

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39. Length of latus rectum of a parabola whose focus is (3,3) and directrix is $3x - 4y - 2 = 0$ is

A. 1

B. 2

C. 3

D. 4

Answer: B

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40. What is the equation of the parabola, whose vertex and focus are on the x-axis at distance a and b from the origin respectively ? $(b > a > 0)$

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

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

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

D. none of these

Answer: B

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41. If vertex of a parabola is origin and directrix is x + 7 = 0 , then its latus rectum is

A. 7

B. 14

C. 28

D. 56

Answer: C

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42. Points on parabola $y^2 = 12x$, whose focal distance is 4, are

A. $\left(2, \pm\sqrt{3}\right)$

B. $\left(1, \pm 2\sqrt{3}\right)$

C. (1,2)

D. none of these

Answer: B

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43. The focal distance of a point on the parabola $y^2 = 16x$ whose ordinate is twice the abscis is

A. 6

B. 8

C. 10

D. 12

Answer: B

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44. A parabola passing through the point (-4,2) has its vertex at the origin and Y-axis as its axis . Then, latus rectum of this parabola is

A. 6

B. 8

C. 10

D. 12

Answer: B

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45. A parabola has the origin as its focus and the line x=2 as the directrix. The vertex of the parabola is at

A. (1,0)

B. (0,1)

C. (2,0)

D. (0,2)

Answer: A

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46. Find the point on the parabola $y^2 = 18x$ at which ordinate is 3 times its abscissa.

A. (6,2)

B. (-2, -6)

C. (3,18)

D. (2,6)

Answer: D

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47. The straight lines $y = \pm x$ intersect the parabola $y^2 = 8x$ in points P and Q, then length of PQ is

A. 4

B. $4\sqrt{2}$

C. 8

D. 16

Answer: D

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48. Equation of the latus rectum of the parabola $2y^2 = 5x$ is

A. $8x - 5 = 0$

B. $8x + 5 = 0$

C. $5x + 8 = 0$

D. $5x - 8 = 0$

Answer: A

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49. For the parabola $y^2 = 4x$, the points (s) P whose focal distance is 17 , is/are

A. $(2, \pm 8)$

B. $(16, \pm 8)$

C. $(8, \pm 8)$

D. $(4, \pm 8)$

Answer: B

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50. The two parabolas $x^2 = 4y$ and $y^2 = 4x$ meet in two distinct points. One of these is origin and the other point is

A. (2,2)

B. (4,-4)

C. (4,4)

D. (-2,2)

Answer: C

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