MATHS

BOOKS - MHTCET PREVIOUS YEAR PAPERS AND PRACTICE PAPERS

CIRCLE AND CONICS

Others

1. Equation of circle with centre (-a,-b) and radius $\sqrt{a^2 - b^2}$ is

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

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

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

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

Answer: A

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2. A circle of radius $\sqrt{8}$ is passing through origin the point (4,0) . If the centre lies on the line y = x , then the equation of the circle is

A. $(x-2)^2 + (y-2)^2 = 8$

B. $(x+2)^2 + (y+2)^2 = 8$

C. $(x-3)^2+(y-3)^2=8$

D. $(x+3)^2+(y-3)^2=8$

Answer: A

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3. Find the shortest distance from the point $M(-7,2)$ to the circle $x^2+y^2-10x-14y-151=0$.

A. 0

B. 1

C. 2

D. 4

Answer: C

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4. If one end of a diameter of the circle $x^2 + y^2 - 4x - 6y + 11 = 0$ is (3, 4), then find the coordinates of the other end of the diameter.

A. (2,1)

B. (1,2)

C. (1,1)

D. None of these

Answer: B

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

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

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

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

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

Answer: A

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

A. 10,5

B. 15,20

C. 12,16

D. 5,15

Answer: D

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7. Equation of unit circle concentric with circle $x^2 + y^2 + 8x + 4y - 8 = 0$ is

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

B. $x^2 + y^2 + 8x + 4y + 19 = 0$

C. $x^2 + y^2 - 8x + 4y + 19 = 0$

D. $x^2 + y^2 - 8x - 4y + 19 = 0$

Answer: A

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8. The circle passing through the point (-1,0) and touching the y-axis at (0,2) also passes through the point:

A. $\left(-\frac{3}{2}, 0 \right)$

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

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

D. (-4,0)

Answer: D

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9. If a circle passes through (0,0) and $(a, 0)$ and $(0, b)$, then the coordinates of its centre are

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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10. The line ax+by+c=0 is normal to the circle $x^2 + y^2 + 2gy + 2fy + d = 0$, if

A. ag+bf+c=0

B. ag+bf+-c=0

C. ag-bf+c=0

D. ag-bf-c=0

Answer: B

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11. The coordinates of the centre of the smallest circle passing through the origin and having $y = x + 1$ as a diameter

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

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

C. (-1,0)

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

Answer: D

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12. Area of the equilateral $\triangle$ inscribed in the circle $x^2 + y^2 - 7x + 9y + 5 = 0$, is .....

A. $\frac{155}{8}\sqrt{3}sq$ units

B. $\frac{165}{8}\sqrt{3}$ sq units

C. $\frac{175}{8}\sqrt{3}$ sq

D. $\frac{165}{8}\sqrt{3}$ sq units

Answer: B

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13. The equation of circle which touches the line $y = x$ at origin and passes through the point (2,1) is

$x^2 + y^2 + px + qy = 0$ Then p, q are

A. $-5, \ -5$

B. $-5, 5$

C. $5 - 5$

D. None of these

Answer: B

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14. Find the area (in square units of the circle which touches the lines $4x + 3y = 15$ and $4x + 3y = 5$.

A. 4 r

B. 3r

C. 2 r

D. r

Answer: D

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15. The equations of the circle which pass through the origin and make intercepts of lengths 4 and 8 on the X and Y-axes respectively are

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

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

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

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

Answer: A

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16. The locus of centre of a circle which passes through the origin and cuts off a length of 4 units on the line $x = 3$ is

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

B. $y^2 + 6x = 13$

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

D. $x^2 + 6y = 13$

Answer: B

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17. The radius of the cicllе $x^2 + y^2 + 4x + 6y + 13 = 0$ is

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18. The locus of the centre of the cicle for which one end of a diamert is (1.) while the other end is one the line

A. x+y=1

B. (x-y)=5

C. 2x +2y=5

D. None of these

Answer: C

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19. If x-y+1=0 meets thwe cicle $x^2 + y^2 + y - 1 = 0$at a and b, then the equation of the circle with ab as diameter, is

A. $2\left(x^2 + y^2\right) + 3x - y + 1 = 0$

B. $2\left(x^2 + y^2\right) + 3x - y + 2 = 0$

C. $2\left(x^2+y^2\right)+3x-y+3=0$

D. $2\left(x^2+y^2+3x-y+1=0\right.$

Answer: A

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20. Which of the folloeing equation gives circle?

A. $r=2\sin 0$

B. $r^2\cos 20=1$

C. $r(4\cos 0+5\sin 0)=3$

D. $5=r\left(1+\sqrt{2}\cos 0\right)$

Answer: A

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21. If the length of the latusterctum and the length of transvere axis of a hyperbola are $4\sqrt{3}$and 2sqrt(3)` respectively. Then the equation of the hyperbola is

A. $\frac{x^2}{3} - \frac{y^2}{4} = 1$

B. $\frac{x^2}{3} - \frac{y^2}{9} = 1$

C. $\frac{x^2}{6} - \frac{y^2}{9} = 1$

D. $\frac{x^2}{3} - \frac{y^2}{6} = 1$

Answer: D

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22. If the eccentricity of hyperbola $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$ is $\frac{5}{4}$ and $2x + 3y - 6 = 0$ is a focal chord of hyperbola, then length of transverse axis is:

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

B. 6

C. $\frac{24}{7}$

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

Answer: D

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23. The length of the transverse axis of a hyperbola, 2 cos0. the foci of the hyperbola are the same as that of the ellips `9x^(2)+16y^(2)=144. the equation of the hypperbola is

A. $\frac{x^2}{\cos^2\alpha} - \frac{y^2}{7-\cos^2\alpha} = 1$

B. $\frac{x^2}{\cos^2\alpha} - \frac{y^2}{7+\cos^2\alpha} = 1$

C. $\frac{x^2}{+1\cos^2\alpha} - \frac{y^2}{7-\cos^2\alpha} = 1$

D. $\frac{x^2}{+1\cos^2\alpha} - \frac{y^2}{7+\cos^2\alpha} = 1$

Answer: A

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24. A ray emanating from the point $(-4, 0)$ is incident on the ellipse $9x^2 + 25y^2 = 225$ at the point P abscissa 3. Find the equation of the reflected ray after first reflection.

A. $\left(-15, \sqrt{63}\right)$

B. $\left(-\frac{15}{4}, \frac{\sqrt{63}}{4}\right)$

C. $\left(-\frac{15}{4}, \frac{\sqrt{63}}{4}\right)$

D. $\left(-\frac{15}{2}, \frac{\sqrt{63}}{2}\right)$

Answer: C

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25. The curve $5x^2 + 12xy - 22x - 19 = 0$is

A. Ellipse

B. Parabola

C. Hyperbola

D. Parallelstragaight lines

Answer: C

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26. Find the coordinates of the focus, axis of the parabola, the equation of the directrix and the length of the latus rectum.$x^2 = -9y$

A. $y = -\frac{9}{4}, 8$

B. $y = \frac{9}{4}, 9$

C. $y = -\frac{9}{4}, 9$

D. None of these

Answer: B

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27. Let (x,y) be any point on the parabola $y^2 = 4x$. Let P be the point that divides the line segment from (0,0) and (x,y) n the ratio 1:3. Then the locus of P is :

A. $x^2 = y$

B. $x^2 = 2x$

C. $y^2 = x$

D. $x^2 = 2y$

Answer: C

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28. 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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29. 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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30. The sum of the reciprocals of focal distances of a focal chord PO of $y^2 = 4ax$ is

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

B. a

C. 2a

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

Answer: A

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31. The length of the latusrectum of the ellipse $16x^2 + 25y^2 = 400$ is

A. $\frac{5}{16}$ units

B. $\frac{32}{5}$ units

C. $\frac{16}{5}$ units

D. $\frac{5}{32}$ units

Answer: B

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32. For the parabola $y^2 + 8x - 12y + 20 = 0$

A. Vertex is (2,6)

B. Focus is (0,6)

C. Latursrectum 4

D. All of these

Answer: D

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33. The eccentricity of the hyperbola with latursrectum 12 and semi-conjugate axis is $2\sqrt{3}$, is

A. 3

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

C. $2\sqrt{3}$

D. 2

Answer: D

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34. For the hyperbola $\frac{x^2}{\cos^2\alpha} - \frac{y^2}{\sin^2\alpha} = 1$, which of the following remains constant when α varies? (1) eccentricity (2) directrix (3) abscissae of vertices (4) abscissae of foci

A. Eccentricity

B. Directrix

C. Abscissae

D. Abscissae of foci

Answer: D

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35. The foci of the conic section

A. $(0, \pm 3)$

B. $(0, \pm 2)$

C. $(3, \pm 3)$

D. $(0, \pm 1)$

Answer: C

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36. The equation of a directrix of the parabola $\frac{x^2}{16} + \frac{y^2}{25} = 1$is

A. $3y = \pm 5$

B. $y = +5$

C. $3y = \pm 25$

D. $y = \pm 3$

Answer: C

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37. The equation of the latus rectum of the parabola $x^2 + 4x + 2y = 0$ is

A. 2y+3=0

B. 3y=2

C. 2y=3

D. 3y+2=0

Answer: C

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38. If P is any point on the ellipse $\frac{x^2}{36} + \frac{y^2}{16} = 1$ and S and S', are the foci, then PS+PS'equal to

A. 4

B. 8

C. 10

D. 12

Answer: D

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39. If the eccentricities of the ellipse $\frac{x^2}{4} + \frac{y^2}{3} = 1$ and the hyperbola $\frac{x^2}{64} - \frac{y^2}{b^2} = 1$ are reciprocals of each other, then $b^2 =$

A. 192

B. 64

C. 16

D. 32

Answer: A

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40. If the vertex of the parabola $y = x^2 - 16x + k$ lies on x-axis,then the value of k is

A. 16

B. 8

C. 64

D. -64

Answer: C

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41. यदि एक परवलयाकार परावर्तक का व्यास 20 सेमी और गहराई 5 सेमी है | नाभि ज्ञात कीजिए |

A. (0,5)

B. (5,0)

C. (0,4)

D. (4,0)

Answer: B

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42. An equilateral triangle is inscribed in the parabola $y^2 = 4ax$ where are at the vertex of the parabola. find the length of the side of the triangle.

A. $8\sqrt{3}a$

B. $8\sqrt{2}a$

C. $4\sqrt{3}a$

D. $4\sqrt{2}a$

Answer: A

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43. एक मेहराब परवलय के आकर का है और इसका अक्ष ऊर्ध्वाधर है | मेहराव 10 मीटर ऊँचा है और आधार में 5 मीटर मीटर चौड़ा है यह परवलय के दो मीटर की दुरी पर शीर्ष से कितना चौड़ा होगा ?

A. 2.03m

B. 2.13m

C. 2.23m

D. 2.33m

Answer: C

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44. Find the area of the triangle formed by the lines joining the vertex of the parabola $x^2 = 12y$to the ends of its latus rectum.

A. 12 sq. units

B. 14 sq. units

C. 16 sq. units

D. 18.sq. units

Answer: D

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45. एक 12 सेंटीमीटर लम्बी छड़ इस प्रकार चलती है कि इसके सिरे निर्देशांछो को स्पर्श करते हैं बिंदु का बिंदुपथ ज्ञात कीजिए जो X-अक्ष के संपर्क वाले सिरे से 3 सेमी दूर है

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

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

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

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

Answer: B

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46. Circle(s) touching x-axis at a distance 3 from the origin and having an intercept of length $2\sqrt{7}$ on y-axis is (are)

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

B. $x^2 + y^2 + 6x + 7y + 9 = 0$

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

D. $x^2 + y^2 + 6x - 7y + 9 = 0$

Answer: C

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47. The circle passing through (1, -2) and touching the axis of x at (3, 0) also passes through the point (1) (2, -5) (2) (5, -2) (3) (-2, 5) (4) (-5, 2)

A. $-(5, 2)$

B. $-(2, -5)$

C. $(5, -2)$

D. $-(2, 5)$

Answer: C

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48. If the equation of tangent to the circle $x^2 + y^2 - 2x + 6y - 6 = 0$ and parallel to $3x - 4y + 7 = 0$ is $3x - 4y + k = 0$ then the values of k are

A. 5,-35

B. $-5, 35$

C. $7, \ -32$

D. $-7, 32$

Answer: A

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49. Circles are drawn through the point (2, 0) to cut intercept of length 5 units on the x-axis. If their centers lie in the first quadrant, then find their equation.

A. $x^2 + y^2 - 9x + 2fy + 14 = 0$

B. $3x^3 + 3y^2 + 27x - 2fy + 42 = 0$

C. $x^2 + y^2 - 9x - 2fy + 14 = 0$

D. $x^2 + y^2 - 2fx - 9y + 14 = 0$

Answer: A

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50. The distance of the mid -point of line joining two ponts (4,0) and (0,4) from the centre of the circle $x^2 + y^2 = 16$ is

A. $\sqrt{2}$

B. $2\sqrt{2}$

C. $3\sqrt{2}$

D. $3\sqrt{3}$

Answer: B

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51. Find the equation of a circle with centre (h, k) and touching the x -axis.

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

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

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

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

Answer: A

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52. The straight line $x + y - 1 = 0$ meets the circle . $x^2 + y^2 - 6x - 8y = 0$ at A and B. Then, the equation

of : the circle of which AB is a diameter, is

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

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

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

D. $3\left(x^2 + y^2\right) + 2y - 6 = 0$

Answer: B

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53.

$The - equation(x - x_1)(x - x_2) + (y - y_1)(y - y_2) = 0$

Represents a circle whose centre is

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54. The equation of the circle having x-y-2=0 and x-y+2=0 as two langents and x-y=0 as 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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55. If the line y = 7x - 25 meets the circle $x^2 + y^2 = 25$ in the points A,B then the distance between A and B is

A. $\sqrt{10}$

B. 10

C. $5\sqrt{2}$

D. 5

Answer: C

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56. The nearest point on the circle $x^2 + y^2 - 6x + 4y - 12 = 0$ from (-5,4) is

A. $(-7, 5)$

B. $(-7, -5)$

C. $(7, -5)$

D. $(7, 5)$

Answer: B

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57. One of the diameters of the circle $x^2 + y^2 - 12x + 4y + 6 = 0$ is given by

A. x+y=0

B. x+3y=0

C. x=y

D. 3x+2y=0

Answer: C

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58. A parabola has the origin as its focus and the line $x = 2$ as the directrix. Then the vertex of the parabola is at (1) (0, 2) (2) (1, 0) (3) (0, 1) (4) (2, 0)

A. (2,0)

B. (0,2)

C. (1,0)

D. (0,1)

Answer: B

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59. A focus of an ellipse is at the origin. The directrix is the line $x = 4$ and the eccentricity is $\frac{1}{2}$ Then the length of the semi-major axis is

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

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

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

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

Answer: D

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60. The directrix of the parabola $y^2 + 4x + 3 = 0$is

A. $x - \frac{4}{3} = 0$

B. $x - \frac{1}{4} = 0$

C. $x - \frac{3}{4} = 0$

D. $x - \frac{1}{4} = 0$

Answer: B

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61. If the distance between the foci and the distance between the directrices of the hyperbola $\frac{x^2}{a_2} - \frac{y^2}{b_2} = 1$ are in the ratio 3:2

A. $\sqrt{2}:1$

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

C. $1:\sqrt{2}$

D. $2:1$

Answer: B

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

A. 4

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

C. $\sqrt{12}$

D. $\frac{7}{12}$

Answer: A

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64. If $eande'$ the eccentricities of a hyperbola and its conjugate, prove that $\frac{1}{e^2}+\frac{1}{e'^2}=1.$

A. 0

B. 1

C. 2

D. 3

Answer: B

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65. If the eccentricity of a hyperbola is $\sqrt{3}$, the eccentricity of its conjugate hyperbola, is

A. $\sqrt{2}$

B. $\sqrt{3}$

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

D. $2\sqrt{3}$

Answer: C

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66. $If\left(-1, -2\sqrt{2}\right)$ is one of exteremity of a focal chord of the parabola $y^2 = -8x$, then the other extremity is

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

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

C. $\left(-4, 4\sqrt{2},\right.$

D. $\left(4, 4\sqrt{2}\right)$

Answer: C

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67. The latus rectum of a parabola whose focal chord is PSQ such that SP = 3 and SQ = 2

A. 24/5

B. 12/5

C. 6/5

D. 1/5

Answer: A

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68. An ellipse has OB as the semi-minor axis, $FandF'$ as its foci, and $\angle FBF'$ a right angle. Then, find the eccentricity of the ellipse.

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

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

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

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

Answer: D

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69. Distance between foci is 8 and distance between directrices is 6 of hyperbola, then length of latusrectum is

A. $4\sqrt{3}$

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

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

D. None of these

Answer: B

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70. The distance between the directive of the hyperbola x=8 sec0,y=8 tan 0 is

A. $8\sqrt{2}$

B. $16\sqrt{2}$

C. $4\sqrt{2}$

D. $6\sqrt{2}$

Answer: A

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71. The eccenttricity of the hyperbola $\frac{x^2}{16} - \frac{y^2}{25} = 1$is

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

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

C. $\frac{\sqrt{41}}{4}$

D. $\frac{\sqrt{41}}{5}$

Answer: C

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72. The eccentricity of the ellipse

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

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

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

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

Answer: D

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73. Find the locus of a point whiich moves in such a way that the sum of its distances from the points $(a, 0, 0)$ and $(a, 0, 0)$ is constant.

A. Circle

B. a straight line

C. a hyperbola

D. an ellipse

Answer: C

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74. The cable of a uniformly loaded suspension bridge hangs in the form of a parabola. The roadway which is horizontal and 100 m long is supported by vertical wires attached to the cable, the longest wire being 30 m and the shortest being 6 m. Find t

A. 9.11 m

B. 9.01 m

C. 9 m

D. None of these

Answer: A

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75. एक मेहराव अर्ध-दीर्घ वृत्ताकार रूप का है यह 8 मीटर चौड़ा और केंद्र से 2 मीटर ऊंचा है एक सिरे से 1.5 मीटर दूर बिंदु पर मेहराब की ऊंचाई ज्ञात कीजिए

A. 1m

B. 1.26 m

C. 1.46 m

D. 1.56 m

Answer: D

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