MATHS

BOOKS - TARGET MATHS (HINGLISH)

CIRCLE AND CONICS

CLASSICAL THINKING

1. Centre of the circel $(x-3)^2+(y-4)^2=5$ is

A. $(3, 4)$

B. $(-3, -4)$

C. $(4, 3)$

D. $(-4, -3)$

Answer: A

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2. The equation of the circle which touches both the axes and whose radius is a, is

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

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

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

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

Answer: A

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

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

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

C. $x^2 + y^2 + 2x + 4y + 1 = 0$

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

Answer: B

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5. 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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6. Find the radius of the circle $(x-5)(x-1)+(y-7)(y-4)=0$.

A. 3

B. 4

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

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

Answer: C

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7. The circle represented by the equation $x^2 + y^2 + 2gx + 2fy + c = 0$ will be a point circle, if

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

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

C. $g^2 + f^2 + c = 0$

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

Answer: A

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8. If the radius of the circle $x^2 + y^2 - 18x + 12y + k = 0$ be 11, then $k =$

A. 347

B. 4

C. -4

D. 49

Answer: C

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9. For the circle $x^2 + y^2 + 3x + 3y = 0$, which of the following relation is true ?

A. Centre lies on X-axis

B. Centre lies on Y-axis

C. Centre is at origin

D. Circle passes through origin

Answer: D

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10. For the circle $x^2 + y^2 + 6x - 8y + 9 = 0$, which of the following statement is true ?

A. Circle passes through the point $(-3, 4)$

B. Circle touches X-axis

C. Circle touches Y-axis

D. None of these

Answer: B

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11. If the circle $x^2 + y^2 + 2gx + 2fy + c = 0$ touches X-axis, then

A. $g = f$

B. $g^2 = c$

C. $f^2 = c$

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

Answer: B

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12. 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. $g = f = c$

B. $g = f = c = r$

C. $g = f = \sqrt{c} = r$

D. $g = f$ and $c^2 = r$

Answer: C

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13. The circle $x^2 + y^2 + 4x - 4y + 4 = 0$ touches

A. X-axis

B. Y-axis

C. X-axis and Y-axis

D. None of these

Answer: C

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14. Circle $x^2 + y^2 + 6y = 0$ touches

A. Y-axis at the origin

B. X-axis at the origin

C. X-axis at the point $(3, 0)$

D. Y-axis at the point $(0, 2)$

Answer: B

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15. Which of the following line is a diameter of the circel $x^2 + y^2 - 6x - 8y - 9 = 0$?

A. $3x - 4y = 0$

B. $4x - y = 0$

C. $x + y = 7$

D. $x - y = 1$

Answer: C

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16. If the line $x + 2by + 7 = 0$ is a diameter of the circle $x^2 + y^2 - 6x + 2y = 0$, then find the value of b

A. 3

B. -5

C. -1

D. 5

Answer: D

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17. The equation of the circle concentric with 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. $x^2 + y^\circ - 4x - 6y + 87 = 0$

D. $x^2 + y^2 - 4x - 6y - 87 = 0$

Answer: B

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

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

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

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

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

Answer: C

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19. Find the equation of circle whose centre is the point $(1, -3)$ and touches the line $2x - y - 4 = 0$

A. $5x^2 + 5y^2 - 10x + 30y + 49 = 0$

B. $5x^2 + 5y^2 + 10x + 30y - 49 = 0$

C. $5x^2 + 5y^2 + 10x + 30y - 49 = 0$

D. $5x^2 + 5y^2 - 10x - 30y + 49 = 0$

Answer: A

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20. Thte parametric form of the equation of circle $4x^2 + 4y^2 = 9$ is

A. $x = \frac{3}{2}\cos\theta, y = \frac{3}{2}\sin\theta$

B. $x = \frac{2}{3}\sin\theta, y = \frac{2}{5}\cos\theta$

C. $x = \frac{3}{4}\sin\theta, y = \frac{3}{4}\cos\theta$

D. $x = 3\sin\theta, y = \sqrt{2}\cos\theta$

Answer: A

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21. The parametric representation of the circel $(x-3)^2+(y+4)^2=25$ is

A. $x=5+3\cos\theta, y=5-3\sin\theta$

B. $x=5+3\cos\theta, y=5+3\sin\theta$

C. $x=3+5\cos\theta, y=-4+5\sin\theta$

D. $x=3+5\cos\theta, y=-3+5\sin\theta$

Answer: C

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22. Parametric form of equation given by $x^2 + y^2 + 2x - 4y - 4 = 0$ is

A. $x = 1 - 3\cos\theta, y = 1 + 3\sin\theta$

B. $x = -1 + 3\cos\theta, y = 2 + 2\sin\theta$

C. $x = 2 - 3\cos\theta, y = 2 - 3\sin\theta$

D. $x = 5 - \cos\theta, y = 5 - \sin\theta$

Answer: B

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23. The centre of the circel $x = -1 + 2\cos\theta, y = 3 + 2\sin\theta,$ is

A. $(1, -3)$

B. $(-1, 3)$

C. $(1, 3)$

D. $(-1, -3)$

Answer: B

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24. The parabola $y^2 = x$ is symmetric about

A. X-axis

B. Y-axis

C. Both X-axis and Y-axis

D. The line $y = x$

Answer: A

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25. If have vertex of a parabola be at origin and directrix be $x + 5 = 0,$ then its latus pectum is

A. 5

B. 10

C. 20

D. 40

Answer: C

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

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

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

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

D. 4

Answer: C

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27. A parabola passing through the point $(-4, -2)$ has its vartex at the origin and Y-axis as its axis. The latus rectum of the parabola is

A. 6

B. 8

C. 10

D. 12

Answer: B

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28. The end points of latus rectum of the parabola $x^2 = 4ay$ are

A. $(a, 2a), (2a, a)$

B. $(-a, 2a), (2a, a)$

C. $(a, -2a), (2a, a)$

D. $(-2a, a).\ (2a, a)$

Answer: D

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29. The co-ordinates of end points of the latus rectum of the parabola $5y^2 = 4x$ are

A. $\left(\frac{1}{5}, \frac{2}{5}\right), \left(-\frac{1}{5}, \frac{2}{5}\right)$

B. $\left(\frac{1}{5}, \frac{2}{5}\right), \left(\frac{1}{5}, -\frac{2}{5}\right)$

C. $\left(\frac{1}{5}, \frac{4}{5}\right), \left(\frac{1}{5}, \frac{4}{5}\right)$

D. $\left(\frac{1}{5}, \frac{4}{5}\right), \left(-\frac{1}{5}, \frac{4}{5}\right)$

Answer: B

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30. The ends of latus rectum of parabola $x^2 + 8y = 0$ are

A. $(-4, -2)$ and $(4, 2)$

B. $(4, -2)$ and $(-4, 2)$

C. $(-4, -2)$ and $(-4, 2)$

D. $(4, 2)$ and $(-4, 2)$

Answer: C

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31. The points on the parabola $y^2 = 12y$ whose focal distance is 4, are

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

B. $(1, 2\sqrt{3}), (1 - 2\sqrt{3})$

C. $(1, 2)$

D. None of these

Answer: B

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32. The point on the parabola $y^2 = 36x$ whose ordinate is three times the abscissa, is

A. $(4, 12)$

B. $(6, 2)$

C. $(2, 6)$

D. $(1, 3)$

Answer: A

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33. Which of the following points lie on the parabola $x^2 = 4ay$

A. $x = at^2, y = 2at$

B. $x = 2at, y = at$

C. $x = 2at^2, y = at$

D. $x = 2at, y = at^2$

Answer: D

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34. Vertex of the parabola $y^2 + 2y + x = 0$ lies in the

A. First quadrant

B. Second quadrant

C. Third quadrant

D. Fourth quadrant

Answer: D

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35. If $(2, 0)$ is the vertex and y-axis the directrix of a parabola then its focus is

A. $(2, 0)$

B. $(-2, 0)$

C. $(4, 0)$

D. $(-4, 0)$

Answer: C

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36. The focus of the parabola $y^2 = 4y - 4x$ is

A. $(0, 2)$

B. $(1, 2)$

C. $(2, 0)$

D. $(2, 1)$

Answer: A

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37. The equation of the directrix of the parabola $x^2 - 4x - 8y + 12 = 0$ is-

A. $x = 1$

B. $y = 0$

C. $x = -1$

D. $y = -1$

Answer: D

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38. Axis of the parabola $x^2 - 4x - 3y + 10 = 0$ is

A. $y + 2 = 0$

B. $x + 2 = 0$

C. $y - 2 = 0$

D. $x - 2 = 0$

Answer: D

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39. The length of the latus rectum of the parabola $x^2 - 4x - 8y + 12 = 0$ is

A. 4

B. 6

C. 8

D. 10

Answer: C

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40. The end points of the latus rectum of the parabola $x^2 + 5y = 0$ is

A. $\left(\pm \frac{5}{2}, -\frac{5}{4} \right)$

B. $\left(\pm \frac{2}{5}, \pm \frac{4}{5} \right)$

C. $\left(\pm \frac{4}{5}, \pm \frac{4}{5} \right)$

D. $\left(\pm \frac{5}{4}, -\frac{5}{2} \right)$

Answer: A

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41. The equation of the ellipse whose one cocus is at $(4, 0)$ an whose eccentricity is $\frac{4}{5}$, is

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

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

C. $\frac{x^2}{5^2} + \frac{y^2}{4^2} = 1$

D. $\frac{x^2}{4^2} + \frac{y^2}{5^2} = 1$

Answer: B

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42. Find the equation of an ellipse whose eccentricity is 2/3, the latus rectum is 5 and the centre is at the origin.

A. $\frac{x^2}{81} + \frac{y^2}{45} = 1$

B. $\frac{4x^2}{81} + \frac{4y^2}{45} = 1$

C. $\frac{x^2}{9} + \frac{y^2}{5} = 1$

D. $\frac{x^2}{81} + \frac{y^2}{45} = 5$

Answer: B

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43. For the ellipse $\frac{x^2}{64} + \frac{y^2}{28} = 1,$ the eccentricity is

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

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

C. $\frac{1}{\sqrt{7}}$

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

Answer: A

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44. Eccentricity of conic $16x^2 + 7y^2 = 112$ is

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

B. $\frac{7}{16}$

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

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

Answer: C

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45. If the distance between the directrices is thrice the distance between the foci, then find eccentricity of the ellipse.

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

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

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

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

Answer: C

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46. If the distance between the foci of an ellipse is equal to its axis, then its eccentricity is

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

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

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

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

Answer: B

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47. 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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48. Equation $x = a\cos\theta, y = b\sin\theta(a > b)$ represent a conic sectin whose eccentricity e is given by

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

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

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

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

Answer: C

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49. For the ellipse $3x^2 + 4y^2 = 12,$ the length of latus rectum is

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

B. 3

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

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

Answer: B

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50. the length of the latusrectum of the ellipse $\frac{x^2}{36}+\frac{y^2}{49}=1$, is

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

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

C. $\frac{72}{14}$

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

Answer: B

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

A. $\frac{39}{4}$

B. 12

C. 15

D. $\frac{37}{2}$

Answer: A

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53. The distance of the point θ on the ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ from a focus is

A. $a(e + \cos\theta)$

B. $a(e - \cos\theta)$

C. $a(1 + e\cos\theta)$

D. $a(1 + 2e\cos\theta)$

Answer: C

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54. The coentre of the ellipse $4x^2 + 9y^2 - 16x - 54y + 61 = 0$ is

A. $(1, 3)$

B. $(2, 3)$

C. $(3, 2)$

D. $(3, 1)$

Answer: B

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55. The equation of hyperbola whose foci are $(2, 4)$ and $(-2, 4)$ and eccentricity is $\frac{4}{3}$, is

A. $x^2 - (y-4)^2 = 5$

B. $\frac{x^2}{9} - \frac{4(y-4)^2}{7} = 1$

C. $\frac{x^2}{9} - \frac{y^2}{7} = \frac{1}{4}$

D. None of these

Answer: B

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56. 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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57. If the length of the transverse and conjuigate axes of hyperbola be 8 and 6 respectively, then the difference of focal distance of any point of the hyperbola will be

A. 8

B. 6

C. 14

D. 2

Answer: A

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58. The foci of the hyperbola $9x^2 - 16y^2 = 144$ are $(\pm 4, 0)$ b. $(0, \pm 4)$ c. $(\pm 5, 0)$ d. $(0, \pm 5)$

A. $(\pm 4, 0)$

B. $(0, \pm 4)$

C. $(\pm 5, 0)$

D. $(0, \pm 5)$

Answer: C

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59. The eccentricity of the hyperbola can never be equal to

A. $\sqrt{\frac{9}{5}}$

B. $2\sqrt{\frac{1}{9}}$

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

D. 2

Answer: B

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60. The eccentricity of the hyperbola $x^2 - y^2 = 25$ is

A. $\sqrt{2}$

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

C. 2

D. $1 + \sqrt{2}$

Answer: A

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61. Eccentricity of hypewrbola $\frac{x^2}{k}+\frac{y^2}{k}\Big)=1(k<0)$ is

A. $\sqrt{1+k}$

B. $\sqrt{1-k}$

C. $\sqrt{1+\frac{1}{k}}$

D. $\sqrt{1-\frac{1}{k}}$

Answer: D

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

B. 2

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

D. $\sqrt{2}$

Answer: C

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63. The latus rectum of the hyperbola $16x^2 - 9y^2 = 144$ is $16/3$

b. $32/3$ c. $8/3$ d. $4/3$

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

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

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

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

Answer: B

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64. The length of the latus rectum of the hyperbola $3x^2 - y^2 = 4$ is

A. $8\sqrt{3}$

B. $4\sqrt{3}$

C. 16

D. 32

Answer: B

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65. A point on the curve $\frac{x^2}{A^2} - \frac{y^2}{B^2} = 1$ is

A. $(A\cos\theta, B\sin\theta)$

B. $(A\sec\theta, B\tan\theta)$

C. $\left(A\cos^2\theta, B\sin^2\theta\right)$

D. None of these

Answer: B

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66. The distance between the directrices of the hyperabola $x = 8\sec\theta, y = 8\tan\theta$ is-

A. $16\sqrt{2}$

B. $\sqrt{2}$

C. $8\sqrt{2}$

D. $4\sqrt{2}$

Answer: C

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67. The centre of the hyperbola

$9x^2 - 36x - 16y^2 + 96y - 252 = 0$, are

A. $(2, 3)$

B. $(-2, -3)$

C. $(-2, 3)$

D. $(2, -3)$

Answer: A

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68. The eccentricity of the hyperbola $5x^2 - 4y^2 + 20x + 8y = 4$ is

A. $\sqrt{2}$

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

C. 2

D. 3

Answer: B

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69. The equation $x = \frac{e^t + e^{-t}}{2}, y = \frac{e^t - e^{-t}}{2}, t \in R,$ represents

A. An ellipse

B. A parabola

C. A hyperbola

D. A circel

Answer: C

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70. The auxiliary equation of circle of hyperbola $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$, is

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

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

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

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

Answer: A

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CRITICAL THINKING

1. Radius of the circle $x^2 + y^2 + 2x\cos\theta + 2ys\int h\eta - 8 = 0$ is 1

2. 3 3. $2\sqrt{3}$ 4. $\sqrt{10}$ 5. 2

A. 1

B. 3

C. $2\sqrt{3}$

D. $\sqrt{10}$

Answer: B

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2. Find the equation of the circle having $(1, -2)$ as its centre and passing through the intersection of the lines $3x + y = 14 adn 2x + 5y = 18.$

A. $x^2 + y^2 - 2x + 4y - 20 = 0$

B. $x^2 + y^2 - 2x - 4y - 20 = 0$

C. $x^2 + y^2 + 2x - 4y - 20 = 0$

D. $x^2 + y^2 + 2x + 4y - 20 = 0$

Answer: A

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3. Find the equation of the circle passing through the origin and cutting intercepts of lengths 3 units and 4 unitss from the

positive exes.

A. $x^2 + y^2 + 6x + 8y + 1 = 0$

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

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

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

Answer: D

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4. If the lines $x + y = 6$ and $x + 2y = 4$ be diameters of the circel whose diameter is 20, then the equation of the circle is

A. $x^2 + y^2 - 16x + 4y - 32 = 0$

B. $x^2 + y^2 + 16x + 4y - 32 = 0$

C. $x^2 + y^2 + 16x + 4y + 32 = 0$

D. $x^2 + y^2 + 16x - 4y + 32 = 0$

Answer: A

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5. A circle has radius 3 units and its centre lies on the line y=x-1.

Find the equation of the circle if it passes through (7,3).

A. $x^2 + y^2 - 8x - 6y + 16 = 0$

B. $x^2 + y^2 + 8x + 6y + 16 = 0$

C. $x^2 + y^2 - 8x - 6y - 16 = 0$

D. $x^2 + y^2 + 8x - 6y - 16 = 0$

Answer: A

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6. The equation of a circel with center $(-4, 3)$ and touching the circel $x^2 + y^2 = 1,$ 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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7. The equation of the circel with cente at $(2, -2)$ and passing through the centre of the given 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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8. Find the equation of the circle concentric with the circle $x^2 + y^2 - 4x - 6y - 3 = 0$ and which touches the y axis

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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9. Equation of the circel which touches the lines $x = 0, y = 0$ and $3x + 4y = 4$ is

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

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

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

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

Answer: B

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

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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11. The equation of circle concentric with circle $x^2 + y^2 - 6x + 12y + 15 = 0$ and double its area 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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12. 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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13. Find the locus of the center of the circle which cuts off intercepts of lengths $2aand2b$ from the x-and the y-axis, respectively.

A. $x + y = a + b$

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

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

D. $ax^2 + y^2 = a^2 - b^2$

Answer: C

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14. If a circle passes through the point $(0, 0), (a, 0) and (0, b)$, then find its center.

A. (a, b)

B. (b, a)

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

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

Answer: C

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15. For what value ofk, the points $(0, 0), (1, 3), (2, 4)$ and $(k, 3)$ are con-cyclic :

A. 2

B. 1

C. 4

D. 5

Answer: B

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16. The centre and radius of a circle given by equation $x = 2 + 3\cos\theta, y = 3 - 3\sin\theta$ are

A. centre $= (2, 3)$, radius $= 3$ units

B. centre $= (3, 2)$, radius $= 5$ units

C. centre $= (1, 3)$, radius $= 3$ units

D. centre $= (3, 2)$, radius $= 3$ units

Answer: A

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17. Radius of the parametric equation represented by $x = 2a\left(\frac{1-t^2}{1+t^2}\right), y = \frac{4at}{1+t^2}$ is

A. a

B. a^2

C. $3a$

D. $2a$

Answer: D

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18. Prove that for all values of θ , the locus of the point of intersection of the lines $x\cos\theta + y\sin\theta = a$ and $x\sin\theta - y\cos\theta = b$ is a circle.

A. An ellipse

B. A circle

C. A parabola

D. A hyperbola

Answer: B

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19. The equatio of the parabola with its vertex at the origin, axis on the Y-axis and passing through the point $(6, -3)$ is

A. $y^2 = 12x + 6$

B. $x^2 = 12y$

C. $x^2 = -12y$

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

Answer: C

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20. Equation of the parabola, whose vertex is $(-1, -2)$, axis is vertical and which passes through the point $(3, 6)$, is

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

B. $2x^2 = 3y$

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

D. $3x^2 = 2y$

Answer: A

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21. The equation of the parabola whose vertex is at(2, 1) and focus at(2, -3), is

A. $x^2 + 4x - 8y - 12 = 0$

B. $x^2 - 4x + 8y + 12 = 0$

C. $x^2 + 8y = 12$

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

Answer: B

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22. Equation of the parabola whose directrix is $y = 2x - 9$ and focus $(-8, -2)$, is

A. $x^2 + 4y^2 + 4xy + 16x + 2y + 259 = 0$

B. $x^2 + 4y^2 + 4xy + 116x + 2y + 259 = 0$

C. $x^2 + y^2 + 4xy + 116x + 2y + 259 = 0$

D. None of these

Answer: B

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23. The equation of the parabola with focus (a, b) and directrix $\frac{x}{a} + \frac{y}{b} = 1$ is given by

A. $(ax - by)^2 - 2a^3x - 2b^3y + a^4 + a^2b^2 + b^4 = 0$

B. $(ax+by)^2-2a^3x-2b^3y-a^4+a^2b^2-b^4=0$

C. $(ax-by)^2+a^4+b^4-2a^3x=0$

D. $(ax-by)^2-2a^3x=0$

Answer: A

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24. Write the equation of the parabola with focus (0,0) and directrix $x+y-4=0$.

A. $x^2+y^2-2xy+8x+8y-16=0$

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

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

D. $x^2-y^2+8x+8y-16=0$

Answer: A

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25. The equation

$(13x-1)^2+(13y-1)^2=k(5x-12y+1)^2$ will represent a parabola, if

A. $k=2$

B. $k=81$

C. $k=89$

D. $k=1$

Answer: D

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26. vertex of the parabola $9x^2 - 6x + 36y + 9 = 0$ is

A. $\left(\frac{1}{3}, -\frac{2}{9}\right)$

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

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

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

Answer: A

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27. The equation of parabola is $y^2 + 8x - 12y + 20 = 0,$ then which of the following is correct ?

A. Vertex $(2, 6)$

B. Focus $(0, 6)$

C. Latus rectum =14

D. Axis $y = 4$

Answer: A::B

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

A. -16

B. -4

C. 4

D. 16

Answer: D

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29. If the line $x-1=0$ is the directrix of the parabola $y^2-kx+8=0$, then one of the values of k is $\frac{1}{8}$ (b) 8 (c) 4 (d) $\frac{1}{4}$

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

B. 0

C. 4

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

Answer: C

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30. The axis of the parabola $9y^2-16x-12y-57=0$ is

A. $3y = 2$

B. $x + 23y = 3$

C. $2x = 3$

D. $y = 3$

Answer: A

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31. The latus ractum of a parabola whose directrix is $x + y - 2 = 0$ and focus is $(3, -4)$, is

A. $2\sqrt{2}$

B. $3\sqrt{2}$

C. $6\sqrt{2}$

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

Answer: B

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32. The equation of the latus rectum of a parabola is $x + y = 8$ and the equation of the tangent at the vertex is $x + y = 12$. Then find the length of the latus rectum.

A. $4\sqrt{2}$

B. $2\sqrt{2}$

C. 8

D. $8\sqrt{2}$

Answer: D

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33. Prove that the equation $y^2 + 2Ax + 2By + c = 0$ is represent a parabola and whose axis is parabola to x axis.

A. $x = \frac{B^2 + A^2 - C}{2A}$

B. $x = \frac{B^2 - A^2 + C}{2A}$

C. $x = \frac{B^2 - A^2 - C}{2A}$

D. $x = \frac{A^2 - B^2 - C}{2A}$

Answer: C

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34. The length of the latus rectum of the parabola whose focus is $\left(\frac{u^2}{2}g\sin 2\alpha, -\frac{u^2}{2}g\cos 2\alpha\right)$ and $directrixisy$=u^2/2g`,is

A. $\frac{u^2}{g}\cos^2\alpha$

B. $\frac{u^2}{g}\cos 2\alpha$

C. $\frac{2u^2}{g}\cos^2 2\alpha$

D. $\frac{2u^2}{g}\cos^2 \alpha$

Answer: D

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35. The co-ordinates of a point on $2y^2 = 7x$ whose parameter is -2 are

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

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

C. $(1, -2)$

D. $(1, -3)$

Answer: A

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36. $x-2=t^2, y=2t$ are the parametric equations of the parabola-

A. $y^2=4x$

B. $y^2=-4x$

C. $x^2=-4y$

D. $y^2=4(x-2)$

Answer: D

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37. The parametic representation $(2+t^2, 2t+1)$ represents

A. A parabola with focus $(1, 2)$

B. A parabola with vertex $(2, 1)$

C. A parabola wit vertex $(0, 0)$

D. A parabola with vetex $(1, 2)$

Answer: B

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

A. Ellipes

B. Parabola

C. Hyperbola

D. None of these

Answer: A

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40. The equation of the ellipse whose centre is $(2, -3)$, one of the foci is $(3, -3)$ and the corrsponding vertex is $(4, -3)$ is

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

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

C. $\frac{x^2}{3} + \frac{y^2}{4} = 1$

D. $\frac{x^2}{4} + \frac{y^2}{3} = 1$

Answer: B

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41. The equation of the ellipse whose vertices are $(\pm 5, 0)$ and foci at $(\pm 4, 0)$ is

A. $9x^2 + 25y^2 = 225$

B. $25x^2 + 9y^2 = 225$

C. $3x^2 + 4y^2 = 192$

D. $4x^2 + 3y^2 = 192$

Answer: A

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42. Find the equation of the ellipse with foci at $(\pm 5, 0) and x = \frac{36}{5}$ as one of the directrices.

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. $\frac{x^2}{11} + \frac{y^2}{6} = 1$

Answer: A

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43. The equation of the ellipse whose one of the vertices is $(0, 7)$ and the corresponding dirctrix is $y = 12,$ is

A. $95x^2 + 144y^2 = 4655$

B. $144x^2 + 95y^2 = 4655$

C. $95x^2 + 144y^2 = 13680$

D. $144x^2 + 95y^2 = 13680$

Answer: B

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44. An ellipse $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$ passes through the point $(-3,1)$ and its eccentricity is $\sqrt{\frac{2}{5}}$. The equation of the ellipse is $3x^2+5y^2=32$ (b) $3x^2+5y^2=48$ $5x^2+3y^2=32$ (d) $5x^2+3y^2=48$

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

B. $3x^2+5y^2=25$

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

D. $3x^2+y^2=9$

Answer: A

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45. 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. $x^2 + \sqrt{2}y^2 = 10$

C. $x^2 - 2y^2 = 100$

D. $\sqrt{2}x^2 + y^2 = 10$

Answer: A

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46. Find the equation of an ellipse the distance between the foci is 8 units and the distance between the directrices is 18 units.

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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47. The equatio $\frac{x^2}{2-r} + \frac{y^2}{r-5} + 1 = 0$ represents an ellipse, if

A. $r > 2$

B. $2 < r < 5$

C. $r > 5$

D. None of these

Answer: B

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48. 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. $3x = \pm 25$

Answer: D

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49. If the distance betweent a focus and corresponding directrix of an ellipse be 8 and the eccentricity be $\frac{1}{2}$, then length of the minor axis is

A. 3

B. $4\sqrt{2}$

C. 6

D. $\frac{16\sqrt{3}}{3}$

Answer: D

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50. 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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51. Eccentricity of the ellipse whose latus rectum is equal to the distnce between two focus points, is

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

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

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

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

Answer: B

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52. 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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53. 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. 3

B. 5

C. 4

D. None of these

Answer: C

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54. Prove that the curve represented by $x = 3(\cos t + \sin t), y = 4(\cos t - \sin t), t \in R,$ is an ellipse

A. an elipse

B. a parabola

C. a hyperbola

D. a circle

Answer: A

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55. The length of the axes of the conic $9x^2 + 4y^2 - 4y + 1 = 0$, are

A. $\frac{1}{2}, 9$

B. $3, \frac{2}{5}$

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

D. $3, 2$

Answer: C

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56. The co-ordinates of the foci of the ellipse $3x^2 + 4y^2 - 12x - 8y + 4 = 0,$ are

A. $(1, 2), (3, 4)$

B. $(1, 4), (3, 1)$

C. $(1, 1), (3, 1)$

D. $(2, 3), (5, 4)$

Answer: C

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57. The eccentricity of the ellipse $4x^2 = 9y^2 = 8x + 36y + 4 = 0$ is $\frac{5}{6}$ b. $\frac{3}{5}$ c. $\frac{\sqrt{2}}{3}$ d. $\frac{\sqrt{5}}{3}$

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

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

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

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

Answer: D

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

A. $6, 2\sqrt{5}$

B. $5, \sqrt{5}$

C. $4, 2\sqrt{5}$

D. $6 + 2\sqrt{5}, 2\sqrt{5}$

Answer: D

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59. 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. $\frac{5}{49}x^2 - \frac{196}{51}y^2 = 1$

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. $\frac{51}{4}x^2 - \frac{490}{196}y^2 = 1$

Answer: C

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60. If the centre, vertex and focus of a hyperbola be (0,0), (4,0) and (6,0) respectively, then the equation of the hyperbola is

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

B. $4x^2 - 5y^2 = 80$

C. $5x^2 - 4y^2 = 80$

D. $5x^2 - 4y^2 = 8$

Answer: C

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

A. $\frac{x^2}{4} - \frac{y^2}{5} = \frac{4}{9}$

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

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

D. $\frac{x^2}{5} - \frac{y^2}{9} = 1$

Answer: A

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62. 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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63. Find the equation of the hyperbola whose conjugate axis is 5 and the distance between the foci is 13.

A. $25x^2 - 144144y^2 = 900$

B. $144x^2 - 25y^2 = 900$

C. $144x^2 + 25y^2 = 900$

D. $25x^2 + 144y^2 = 900$

Answer: A

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64. 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. $\sqrt{\frac{x_1^2 - y_1^2 - a^2}{x_1^2 - y_1^2}}$

B. $\sqrt{\frac{a^2 - x_1^2 - y_1^2}{a^2 - x_1^2}}$

C. $\sqrt{\frac{a^2 + x_1^2 + y_1^2}{a^2 - x_1^2}}$

D. none of these

Answer: B

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65. The equation of the hyperbola whose foci are (6.5), (-4,5) and eccentricity 5/4 is

A. $\frac{(x-2)^2}{16} - \frac{(y-5)^2}{9} = 1$

B. $\frac{(x-5)^2}{16} - \frac{(y-5)^2}{9} = 1$

C. $\frac{(x-1)^1}{16} - \frac{(y-5)^2}{9} = -1$

D. $\frac{(x-1)^2}{9} - \frac{(y-5)^2}{16} = 1$

Answer: A

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66. The equation of the hyperbola whose directrix is $2x + y = 1$, focus $(1, 1)$ and eccentricity $= \sqrt{3}$, is

A. $7x^2 + 12xy - 2y^3 - 2x + 4y - 7 = 0$

B. $11x^2 + 12xy + 2y^2 - 10x - 4y = 0$

C. $11x^2 + 2y^2 - 14x - 14y + 1 = 0$

D. $7x^2 + 10xy - 2y^2 - 2x + 4y - 7 = 0$

Answer: A

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67. If e and e' be the eccentricities of two conics $S=0$ and $S'=0$ and if $e^2+e'^2=3$, then both S and S' can be

A. Parabola

B. Ellipse

C. Hyperbola

D. None of these

Answer: C

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68. The vertices of the hyperbola $9x^2-16y^2-36x+96y-252=0$ are

A. $(6,3)$ and $(-6,3)$

B. $(6, 3)$ and $(-2, 3)$

C. $(6, 3)$ and $(-6, -3)$

D. $(3, 6)$ and $(-3, 2)$

Answer: B

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69. The equation of the directrices of the conic $x^2 + 2x - y^2 + 5 = 0$ are

A. $x = \pm 1$

B. $y = \pm 2$

C. $y = \pm \sqrt{2}$

D. $x = \pm \sqrt{3}$

Answer: C

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70. The latus rectum of the hyperbola $9x^2 - 16y^2 + 72x - 32y - 16 = 0$ is

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

B. $-\frac{9}{2}$

C. $\frac{32}{3}$

D. $-\frac{32}{3}$

Answer: A

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71. The locus of the point of intersection of the lines $ax\sec\theta + by\tan\theta = a$ and $ax\tan\theta + by\sec\theta = b$ is

A. A straight line

B. A circle

C. An ellipse

D. A hyperbola

Answer: D

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72. The equation $x = \frac{1}{2}\left(t + \frac{1}{t}\right), y = \frac{1}{2}\left(t - \frac{1}{t}\right), t \neq 0$ represents

A. An ellipse

B. A parabola

C. A circle

D. A hyperbola

Answer: D

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73. The locus of the point of intersection of the lines $bxy - ayt = ab$ and $bx + ay = aby$ is

A. A parabola with focus $(1, 2)$

B. An ellipse

C. A hyperbola

D. None of these

Answer: C

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74. If e and e' are the eccentricities of the ellipse $5x^2 + 9y^2 = 45$ and the hyperbola `5x^(2) - 4y^(2) = 45 respectively , then ee' is equal to

A. 9

B. 5

C. -4

D. 1

Answer: D

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75. The centres of the circles $x^2 + y^2 = 1, x^2 + y^2 + 6x - 2y = 1$ and $x^2 + y^2 - 12x + 4y = 1$ are

A. Same

B. Collinear

C. Non-collinear

D. None of these

Answer: B

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COMPETITIVE THINKING

1. If (α, β) is the centre of a circle passing through the origin, then its equation is

A. $x^2 + y^2 - \alpha x - \beta y = 0$

B. $x^2 + y^2 + 2\alpha x + 2\beta y = 0$

C. $x^2 + y^2 - 2\alpha x - 2\beta y = 0$

D. $x^2 + y^2 + \alpha x + \beta y = 0$

Answer: C

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

A. $x^2 + y^2 - 4x + 4y - 77 = 0$

B. $x^2 + y^{92}) - 4x - 4y - 5 = 0$

C. $x^2 + y^2 + 2x + 2y - 59 = 0$

D. $x^2 + y^2 - 2x - 2y - 23 = 0$

Answer: B

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3. The centre of a circe is $(2, -3)$ and the circumference is 10π.

Then, the equation of the circle is

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

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

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

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

Answer: C

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4. The equation of the circle in the first quadrant which touches each axis at a distance 5 from the origin, is

A. $X^2 + Y^2 + 5X + 5Y + 25 = 0$

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

C. $x^2 + y^{20} - 5x - 5y + 25 = 0$

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

Answer: B

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5. The equation of the circle of radius 5 and touching the coordinates axes in third quadrant, is

A. $(x-5)^2+(y+5)^2=25$

B. $(x+4)^2+(y+4)^2=25$

C. $(x+6)^2+(y+6)^2=25$

D. $(x+5)^2+(y+5)^2=25$

Answer: D

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6. 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. $x^2 + y^2 + 6x + 5y - 9 = 0$

C. $x^2 + y^2 - 6x + 5y - 9 = 0$

D. $x^2 + y^2 + 6x - 5y + 9 = 0$

Answer: A

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7. Consider the circel with centre at the point $(1, 2)$ and having the line $x = y$ as a tangent. The area of the circel is

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

B. π

C. 2π

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

Answer: D

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8. A circel which passes through origin and cuts imtercepts on axes a and b, the equation of circle is

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

Answer: A

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9. The line segment joining the points $(4, 7)$ and $(-2, -1)$ is diameter of a circle. If the circel intersects the X-axis at A and B, then AB is equal to

A. 4

B. 5

C. 6

D. 8

Answer: D

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10. If the lines $2x + 3y + 1 = 0$ and $3x - y - 4 = 0$ lie along diameters of a circle of circumference 10π, then the equation of the circle is

A. $x^2 + y^2 + 2x - 2y - 23 = 0$

B. $x^2 + y^2 - 2x - 2y - 23 = 0$

C. $x^2 + y^2 + 2x - 2y + 23 = 0$

D. $x^2 + y^2 - 2x + 2y - 23 = 0$

Answer: D

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11. The lines $2x - 3y = 5$ and $3x - 4y = 7$ are the diameters of a circle of area 154 sq. units. Then the equation of the circle is

$x^2 + y^2 + 2x - 2y = 62$ $x^2 + y^2 + 2x - 2y = 47$

$x^2 + y^2 - 2x + 2y = 47$ $x^2 + y^2 - 2x + 2y = 62$

A. $x^2 + y^2 + 2x - 2y = 62$

B. $x^2 + y^2 - 2x + 2y = 47$

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

D. $x^2 + y^2 - 2x + 2y = 62$

Answer: B

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12. The equation of circle whose centre lies on $3x - y - 4 = 0$ and $x + 3y + 2 = 0$ and has an area 154 square units, is

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

B. $x^2 + y^2 - 2x + 2y + 47 = 0$

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

D. None of these

Answer: A

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13. The equation of the circle whose diameter lies on $2x + 3y = 3$ and $16x - y = 4$ which passes through $(4, 6)$ is

A. $5\left(x^2 + y^2\right) - 3x - 8y = 200$

B. $x^2 + y^2 - 4x - 8y = 200$

C. $5\left(x^2 + y^2\right) - 4x = 200$

D. $x^2 + y^2 = 40$

Answer: A

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14. The equation of the circle which passes through the points $(2, 3)$ and $(4, 5)$ and the centre lies on the straight line $y - 4x + 3 = 0,$ is

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

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

C. $x^2 + y^2 - 4x - 10y + 16 = 0$

D. $x^2 + y^2 - 14y + 8 = 0$

Answer: B

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15. 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. $(x-3)^2+(y+1)^2=38$

B. $(x+3)^2+(y+1)^2=38$

C. $(x-3)^2+(y+1)^2=38$

D. None of these

Answer: A

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16. $(0, 0)$ is the centre of the circle passing through the vertices of an equilateral triangle. If the length of the median of the triangle is 9 units then equation of the circle is

A. $x^2y^2=18$

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

C. $x^2+y^2=36$

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

Answer: C

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17. ABCD is a square, the length of whose side is a. Taking AB and AD as the coordinate axes, the equation of the circel passing through the ceteices of the square is

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

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

C. $x^2 + y^2 + 1ax + 2ay = 0$

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

Answer: B

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18. 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. $\left(-\frac{3}{2}, \frac{5}{2}\right)$

D. $(-4, 0)$

Answer: D

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19. 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) is _

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

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

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

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

Answer: A

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20. The equatio of a circel touching the coordinate axes and the line $3x - 4y = 12$ is

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

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

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

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

Answer: C

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21. The equation (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_2)

Answer: B

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22. The equation of a circle whose diameter is the line joining the points $(-4, 3)$ and $(12, -1)$ is

A. $x^2 + y^2 + 8x + 2y + 51 = 0$

B. $x^2 + y^2 + 8x - 2y - 51 = 0$

C. $x^2 + y^2 + 8x + 2y - 51 = 0$

D. $x^2 + y^2 - 8x - 2y - 51 = 0$

Answer: D

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23. The equation of the circle passing through the point $(1, 0)$ and $(0, 1)$ and having the smallest radius is

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

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

C. $x^2 + y^2 + 2x + 2y - 7 = 0$

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

Answer: B

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24. The sides of a rectangle are given by $x = \pm a$ and $y = \pm b$. The equation of the circle passing through the vertices of the rectangle is

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

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

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

D. $(x - a)^2 + (y - b)^2 = a^2 + b^2$

Answer: B

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25. For the equation

$ax^2 + by^2 + 2hxy + 2gx + 2fy + c = 0$ where $a \neq 0$, to represent a circle, the condition will be

A. $a = b = 0$ and $c = 0$

B. $f = g$ and $h = 0$

C. $a = b \neq 0$ and $h = 0$

D. $f = g$ and $c = 0$

Answer: C

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26. $ax^2 + 2y^2 + 2bxy + 2x - y + x = 0$ 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. The equation $x^2 + y^2 + 4x + 6y + 13 = 0$ represents

A. circle

B. pair of coincident straight lines

C. pair of concurrent straight lines

D. point circle

Answer: D

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

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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29. 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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30. $x^2+y^2+(2K-1)xy-2x+4y+3=0$ represents the equation of a circle, find k and radius of the circle ?

A. $-2, \sqrt{2}$

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

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

D. $2, \sqrt{3}$

Answer: B

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31. $x^2 + hxy + y^2 - 6x - 2y + k = 0$ is the equation of the circle and 2 is the radius of the circle, then find the values of h and k ?

A. $h = 0, k = -6$

B. $h = 0, k = 6$

C. $h = -3, k = 6$

D. $h = 3, k = 6$

Answer: B

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32. 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. -4

B. 4

C. 0

D. 1

Answer: A

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33. Find the centre and radius of the circles$2x^2 + 2y^2 - x = 0$

A. $\left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right)$

B. $\left(-\frac{1}{2}, 0\right)$ and $\frac{1}{2}$

C. $\left(\frac{1}{2}, 0\right)$ and $\frac{1}{2}$

D. $\left(0, -\frac{1}{4}\right)$ and $\frac{1}{4}$

Answer: A

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34. 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. $(0, 0)$

B. $(1, 1)$

C. $(1, 2)$

D. $(2, 1)$

Answer: C

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35. The point diametrically opposite to the point P(1, 0) on the circle $x^2 + y^2 + 2x + 4y - 3 = 0$ is

A. $(-3, 4)$

B. $(-3, -4)$

C. $(3, 4)$

D. $(3, -4)$

Answer: B

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36. If the line $x + 2by + 7 = 0$ is a diameter of the circle $x^2 + y^2 - 6x + 2y = 0$, then find the value of b

A. 3

B. -5

C. -1

D. 5

Answer: D

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37. If one of the diameters of the curve $^2 + y^2 - 4x - 6y + 9 = 0$ is a chord of a circle with centre $(1, 1)$ then the radius of this circel is

A. 3

B. 2

C. $\sqrt{2}$

D. 1

Answer: A

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38. If one of the diameters of the circle, given by the equation $x^2 + y^2 + 4x + 6y - 12 = 0,$ is a chord of a circle S, whose centre is $(1, -3),$ the radius of S is

A. $\sqrt{41}$ units

B. $3\sqrt{5}$ units

C. $5\sqrt{2}$ units

D. $2\sqrt{5}$ units

Answer: A

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39. Find the equation of a circle of radius 5 which lies within the circle $x^2 + y^2 + 14x + 10y - 26 = 0$ and which touches the given circle at the point $(-1, 3)$.

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

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

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

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

Answer: A

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40. The equation of the circle which passes through the points of intersection of the circles $x^2 + y^2 - 6x = 0$ and $x^2 + y^2 - 6y = 0$ and has its centre at (3/2, 3/2), is

A. $x^2 + y^2 + 3x + 3y + 9 = 0$

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

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

D. $x^2 + y^2 - 3x - 3y + 9 = 0$

Answer: C

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41. The intercept on the line $y = x$ by the circel $x^2 + y^2 - 2x = 0$ is AB, then the question of the circel on AB as a diameter is-

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

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

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

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

Answer: A

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42. Let the line segment joining the centres of the circles $x^2 - 2x + y^2 = 0$ and $x^2 + y^2 + 4x + 8y + 16 = 0$ intersect the circles at P and Q respectively. Then the equation of the circle with PQ as its diameter is

A. $5x^2 + 5y^2 - 2x - 16y + 8 = 0$

B. $5x^2 + 5y^2 - 8x - 24y + 27 = 0$

C. $5x^2 + 5y^2 + 8x + 24y + 27 = 0$

D. $5x^2 + 5y^2 + 2x + 16y + 8 = 0$

Answer: D

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43. If the lengths of the tangents drawn from P to the circles $x^2 + y^2 - 2x + 4y - 20 = 0$ and $x^2 + y^2 - 2x - 8y + 1 = 0$

are in the ratio $2:1$, then the locus of p is

A. $x^2 + y^2 + 2x + 12y + 8 = 0$

B. $x^2 + y^2 - 2x + 12y + 8 = 0$

C. $x^2 + y^2 + 2x - 12y + 8 = 0$

D. $x^2 + y^2 - 2x - 12y + 8 = 0$

Answer: D

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44. IF the tangent at $(1, 7)$ to the curve $x^2 = y - 6$ touches the circle $x^2 + y^2 + 16x + 12y + c = 0,$ then the value of c is

A. 185

B. 85

C. 95

D. 195

Answer: C

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45. Find the centre of the circle that passes through the point $(1, 0)$ and cutting the circles $x^2 + y^2 - 2x + 4y + 1 = 0$ and $x^2 + y^2 + 6x - 2y + 1 = 0$ orthogonally is

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

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

C. $(0, 1)$

D. $(0, 0)$

Answer: D

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46. The number of common tangents to the circles $x^2 + y^2 - 4x - 6y - 12 = 0$ and $x^2 + y^2 + 6x + 18y + 26 = 0$, is

A. 1

B. 2

C. 3

D. 4

Answer: C

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47. The equation of the parabola with the focus (3,0) and directrix x+3=0 is

A. $y^2 = 3x$

B. $y^2 = 2x$

C. $y^2 = 12x$

D. $y^2 = 6x$

Answer: C

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48. The equation of the parabola with focus $(1, -1)$ and directrix $x + y + 3 = 0$ is

A. $x^2 + y^2 - 10x - 2y - 2xy - 5 = 0$

B. $x^2 + y^2 + 10x - 2y - 2xy - 5 = 0$

C. $x^2 + y^2 + 10x + 2y - 2xy - 5 = 0$

D. $x^2 + y^2 + 10x + 2y + 2xy - 5 = 0$

Answer: A

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49. A point on the parabola whose focus is $S(1, -1)$ ans whose vertex is $A(1, 1)$ is

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

B. $(1, 2)$

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

D. $(2, 2)$

Answer: A

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50. The focus of the parabola $x^2 = -16y$ is

A. $(4, 0)$

B. $(0, 4)$

C. $(-4, 0)$

D. $(0, -4)$

Answer: D

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51. Focus and directrix of the parabola $x^2 = -8ay$ are

A. $(0, -1a)$ and $y = 2a$

B. $(0, 2a)$ and $y = -2a$

C. $(2a, 0)$ and $x = -2a$

D. $(-2a, 0)$ and $x = 2a$

Answer: A

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52. The focus of the parabola $y^2 - 4y - x + 3 = 0$ is

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

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

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

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

Answer: D

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53. The focus of the parabola $(y+1)^2 = -8(x+2)$ is

A. $(-4, -1)$

B. $(-1, -4)$

C. $(1, 4)$

D. $(4, 1)$

Answer: A

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

A. Vertex of the parabola is at the prigin.

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

C. Directrix of the parabola is $x = a$

D. Tangent at the vertex is $x = 0.$

Answer: B

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55. The focal chord of the parabola perpendicular to its axis is called as

A. tangent.

B. secant

C. latus reactum.

D. normal.

Answer: C

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56. If $(2, -8)$ is at an end of a focal chord of the parabola $y^2 = 32x$, then find the other end of the chord.

A. $(2, -8)$

B. $(2, 8)$

C. $(32, 32)$

D. $(32, -32)$

Answer: B

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57. If (x_a, y_1) and $(x_2, (y_2)$ are the end points of a focal chord of the parabola $y^2 = 5x$, then $4x_1x_2 + y_1y_2 =$

A. 25

B. 5

C. 0

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

Answer: C

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58. 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. 20 sq. units

B. 18 sq. units

C. 17 sq. units

D. 19 sq. units

Answer: B

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59. The focal distance of a point P on the parabola $y^2 = 12x$ if the ordinate of P is 6, is

A. 13

B. 6

C. 10

D. 12

Answer: B

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60. 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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61. The equation of parabola whose vertex and focus are $(0, 4)$ and $(0, 2)$ respectively, is

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

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

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

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

Answer: C

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62. The equation of the parabola with its vertex at (1, 1) and focus at (3, 1) is

A. $(x-1)^2 = 8(y-1)$

B. $(y-1)^2 = 8(x-3)$

C. $(y-1)^2 = 8(x-1)$

D. $(x-3)^2 = 8(y-1)$

Answer: C

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63. The equation of the parabola with $(-3, 0)$ and focus and $x + 5 = 0$ as directrix, is

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

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

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

D. $y^2 = 4(x-4)$

Answer: C

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64. Find the equation of the parabola whose focus is (5,3) and directrix is the line 3x-4y+1=0.

A. $(4x+3y)^2 - 256x - 142y + 849 = 0$

B. $(4x-3y)^2 - 256x - 142y + 849 = 0$

C. $(3x+4y)^2 - 142x - 256y + 849 = 0$

D. $(3x-4y)^2 - 256 - 142y + 849 = 0$

Answer: A

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65. The equation of parabola whose vertex and focus lie on the axis of x at distances a and a_1 from the origin respectively, is

A. $y^2 = 4(a' - a)(x - a)$

B. $y^2 = 4(a' - a_{x+a}$

C. $y^2 = 4(a' + a)(x - a)$

D. $y^2 = (a' + a)(x + a)$

Answer: A

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66. If P is point on the parabola $y^2 = 8x$ and A is the point $(1, 0)$, then the locus of the mid point of the line segment AP is

A. $y^2 = 4\left(x - \frac{1}{2}\right)$

B. $y^2 - 2(2x + 1)$

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

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

Answer: A

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67. Eccentricity of the parabola $x^2 - 4x - 4y + 4 = 0$ is

A. $e = 0$

B. $e = 1$

C. $e > 4$

D. $e = 4$

Answer: B

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68. 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. $(1, 0)$

B. $(0, 1)$

C. $(2, 0)$

D. $(0, 2)$

Answer: A

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69. The vertex of the parabola $y^2 - 4y - x + 3 = 0$ is

A. $(-1, 3)$

B. $(-1, 2)$

C. $(2, -1)$

D. $(3, -1)$

Answer: B

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70. Vertex of the parabola $x^2 + 4x + 2y - 7 = 0$ is

A. $\left(-2, \frac{11}{2}\right)$

B. $(-1, 2)$

C. $(-2, 11)$

D. $(2, 11)$

Answer: A

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71. The focous of the parabola $y = 2x^2 + x$ is

A. $(0, 0)$

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

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

D. $\left(-\frac{1}{4}, \frac{1}{8}\right)$

Answer: C

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72. The focus of the conic $x^2 - 6x + 4y + 1 = 0$ is

A. $(2, 3)$

B. $(3, 2)$

C. $(3, 1)$

D. $(1, 4)$

Answer: C

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73. A line cuts the X-axis at A $(5, 0)$ and the Y-axis at $B(0, -3)$. A variable line PQ is drawn pependicular to AB cutting the X-axis at P and the Y-axis at A. If AQ and BP meet at R, then the locus of R is

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

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

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

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

Answer: A

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74. The distance between the vertex and the focus of the parabola $x^2 - 2x + 3y - 2 = 0$ is

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

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

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

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

Answer: B

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75. Equation of the directrix of the parabola $y^2 + 4x + 2 = 0$ is

A. $y = 3$

B. $3y = 2$

C. $2y = 3$

D. $3y + 2 = 0$

Answer: C

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76. The equation of the directrix of the parabola $x^2 + 8y - 2x = 7$ is

A. $y = 3$

B. $y = -3$

C. $y = 2$

D. $y = 0$

Answer: A

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77. For the parabola $y^2 + 6y - 2x = -5$

I) the vertex is $(-2, -3)$

II) the directrix is $y + 3 = 0$

Which of the following is correct ?

A. Both I and II are correct

B. I is true, II is false

C. Both I and II are false

D. I is false, II is false

Answer: B

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78. 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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79. Let O be the vertex and Q be any point on the parabola, $x^2 = 8y$. It the point P divides the line segment OQ internally in the ratio 1 : 3, then the locus of P is : (1) $x^2 = y$ (2) $y^2 = x$ (3) $y^2 = 2x$ (4) $x^2 = 2y$

A. $x^2 = y$

B. $y^2 = x$

C. $y^2 = 2x$

D. $x^3 = 2y$

Answer: D

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80. The cartesian co - ordinates of the point on the parabola $y^2 = -16x$, whose parameter is $\frac{1}{2}$, are

A. $(-2, 4)$

B. $(4, 1)$

C. $(-1, -4)$

D. $(-1, 4)$

Answer: C

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81. Tangent and normal are drawn at P(16,16) on the parabola $y^2 = 16x$ which intersect the axis of the parabola at A and B respectively. If C is the centre of the circle through the points P,A and B and $\angle CPB = \theta$ then the value of $\tan\theta$ is

A. 2

B. 3

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

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

Answer: A

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82. 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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83. If $a \neq 0$ and the line $2bx + 3cy + 4d = 0$ passes through the points of intersection of the parabolas $y^2 = 4ax$ and $x^2 = 4ay$, then $d^2 + (2b + 3c)^2 = 0$ $d^2 + (3b + 2c)^2 = 0$ $d^2 + (2b - 3c)^2 = 0$ none of these

A. $d^2 + (3b - 2c)^2 = 0$

B. $d^2 + (3b + 2c)^2 = 0$

C. $d^2 + (2b - 3c)^2 = 0$

D. $d^2 + (2b + 3c)^2 = 0$

Answer: D

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84. The eccentricity of the ellipes $\frac{x^2}{36} + \frac{y^2}{16} = 1$ is

A. $\frac{2\sqrt{5}}{6}$

B. $\frac{2\sqrt{5}}{4}$

C. $\frac{2\sqrt{13}}{6}$

D. $\frac{2\sqrt{13}}{4}$

Answer: A

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85. Eccentricity of the ellipse $4x^3 + y6(2) - 8x + 4x + 4y - 8 = 0$ is

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

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

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

D. $\frac{\sqrt{3}}{8}$

Answer: A

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86. The eccentricity of the conic $x^2 + y^2 - 2x + 3y + 2 = 0$ is

A. 0

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

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

D. $\sqrt{2}$

Answer: B

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87. The lengths of major and minor axis of an ellipse are 10 and 8 respectively and its major axis is along the Y-axis. The equation of the ellipse referred to its centre as origin is

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

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

C. $\frac{x^2}{100} + \frac{y^2}{64} = 1$

D. $\frac{x^2}{64} + \frac{y^2}{100} = 1$

Answer: B

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

Answer: A

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89. The equation of the ellipse with foci $(\pm 2, 0)$ and eccentricity $= \frac{1}{2}$ is

A. $3x^2 + 4y^2 = 48$

B. $4x^2 + 3y^2 = 48$

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

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

Answer: A

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90. If the foci of an ellipse are $(\pm\sqrt{5}, 0)$ and its exccentricity is $\frac{\sqrt{5}}{3}$, then the equation of the ellipse is

A. $9x^2 + 4y^2 = 36$

B. $4x^2 + 9y^2 = 36$

C. $36x^2 + 9y^2 = 4$

D. $4x^2 + 36y^2 = 4$

Answer: B

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91. Equation of the ellipse whose axes are the axes of coordinates and which passes through the point $(-3, 1)$ and has eccentricity $\sqrt{\frac{2}{5}}$ is: (1) $3x^2 + 5y^2 - 32 = 0$ (2)

$5x^2 + 3y^2 - 48 = 0$ (3) $3x^2 + 5y^2 - 15 = 0$ (4)

$5x^2 + 3y^2 - 32 = 0$

A. $5x^2 + 3y^2 = -48 = 0$

B. $3x^2 + 5y^2 - 15 = 0$

C. $5x^2 + 3y^2 - 32 = 0$

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

Answer: D

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92. Find the equation of an ellipse hose axes lie along the coordinate axes, which passes through the point (-3,1) and has eccentricity equal to $\sqrt{2/5}$.

A. $3x^2 + 5y^2 - 15 = 0$

B. $5x^2 + 3y^2 - 32 = 0$

C. $3x^2 + 5y^2 - 32 = 0$

D. $5x^2 + 3y^2 - 48 = 0$

Answer: D

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93. 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. $4x^2 + 3y^2 = 1$

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

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

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

Answer: B

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94. If the equation of ellipse is $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ then $SP + S'P =$

A. a

B. 2a

C. 2b

D. b

Answer: B

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95. Find the differential equation of an ellipse with major and minor axes 2a and 2b respectively.

A. 2a

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

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

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

Answer: A

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96. 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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97. The foci of $16x^2 + 25y^2 = 400$ are

A. $(\pm 3, 0)$

B. $(0, \pm 3)$

C. $(3, -3)$

D. $(-3, 3)$

Answer: A

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98. If the angle betweent he lines joining the end points of minor axis of an ellipse with its foci is $\frac{\pi}{2}$, then the eccentricity of the ellipse is

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

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

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

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

Answer: B

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99. B is extermity of the minor axis of an elipse whose foci are S and S'. If $\angle SBS'$ is a right angle, then the eccfentricity of the ellipse is

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

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

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

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

Answer: B

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100. Let S and s' be the foci of an ellipse and B be one end of its minor axis . If SBS' is a isosceles right angled triangle then the eccentricity of the ellipse is

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

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

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

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

Answer: A

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101. 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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102. 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. $\frac{15}{6}$

Answer: C

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

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

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

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

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

Answer: D

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104. The length of the latus rectum of the ellipse $9x^2 + 4y^2 = 1,$ is

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

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

C. $\frac{4}{9}$

D. $\frac{8}{9}$

Answer: C

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105. The length of the latus rectum of an ellipse is $\frac{1}{3}$ of the major axis. Its eccentricity is

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

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

C. $\frac{5 \times 4 \times 3}{7^3}$

D. $\left(\frac{3}{4}\right)^4$

Answer: B

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106. If the latusrectum of an ellipse is equal to one half of its minor axis , then eccentricity is equal to

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

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

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

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

Answer: B

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107. The distance between the focii of the ellipse $x = 3\cos\theta, y = 4\sin\theta$ is

A. $2\sqrt{7}$

B. $7\sqrt{2}$

C. $\sqrt{7}$

D. $3\sqrt{7}$

Answer: A

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108. The equation of an ellipse whose focus is $(-1, 1)$, directrix is $x - y + 3 = 0$ and eccentricity is $\frac{1}{2}$, is given by

A. $7x^2 + 2xy + 7y^2 + 10x - 10y + 7 = 0$

B. $7x^2 - 2xy + 7y^2 - 10x + 19y + 7 = 0$

C. $7x^2 - 2xy + 7y^2 - 10x - 10y - 7 = 0$

D. $7x^2 - 2xy + 7y^2 + 10x10y - 7 = 0$

Answer: A

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109. The centre of the ellipse

$$\frac{(x + y - 3)^2}{9} + \frac{(x - y + 1)^2}{16} = 1 \text{ is}$$

A. $(-1, 2)$

B. $(1, -2)$

C. $(-1, -2)$

D. $(1, 2)$

Answer: D

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110. Thet eccentricity of the ellipse

$$\frac{(x-1)^2}{9}+\frac{(y+1)^2}{25}=1 \text{ is}$$

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

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

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

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

Answer: A

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111. The ecfentricity of the ellipse

$$\frac{(x-1)^2}{2}+\left(y+\frac{3}{4}\right)^2\frac{1}{16} \text{ is}$$

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

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

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

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

Answer: A

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112. The centre of ellipse

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

A. $(0, 2)$

B. $(2, -1)$

C. $(2, 1)$

D. $(2, -2)$

Answer: D

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113. For the ellipse $25x^2 + 9y^2 - 150x - 90y + 225 = 0$, the eccentricity e =

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

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

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

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

Answer: C

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114. The eccentricity of the curve represented by the equation $x^2 + 2y^2 - 2x + 3y + 2 = 0$ is

A. 0

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

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

D. $\sqrt{2}$

Answer: C

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115. The foci of the ellipse

$25x^2 + 4y^2 + 100x - 4y + 100 = 0$ are

A. $\left(\frac{5\pi\sqrt{21}}{10}, -2\right)$

B. $\left(-2, \frac{5 \pm \sqrt{21}}{10}\right)$

C. $\left(\frac{2 \pm \sqrt{21}}{10}, -2\right)$

D. $\left(-2, \frac{2 \pm \sqrt{21}}{10}\right)$

Answer: B

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116. The equation $5x^2 + y^2 + y = 8$ represents

A. an ellipse

B. a parabola

C. a hyperbola

D. a circle

Answer: A

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117. A man running around a race course notes that the sum of the distances of two flagposts from him a always 10m and the distance between the flag posts is 8m. Then the area of the path he encloses in square meters is 15π (b) 20π (c) 27π (d) 30π

A. 15π

B. 12π

C. 18π

D. 8π

Answer: A

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118. Let P be a variable point on the elipse $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$ with foci F_1 and F_2. If A is the area of the triangle PF_1F_2, then maximum value of A is

A. ab

B. abe

C. $\frac{e}{ab}$

D. $\frac{ab}{e}$

Answer: B

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119. The equation of the hyperbola with vertices $(0, \pm 15)$ and foci $(0, \pm 20)$ is

A. $\frac{x^2}{175} - \frac{y^2}{2250 = 1}$

B. $\frac{x^2}{625} - \frac{y^3}{125} = 1$

C. $\frac{y^2}{225} - \frac{x^2}{125} = 1$

D. $\frac{y^2}{225} - \frac{x^2}{175} = 1$

Answer: D

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120. The equation of the hyperbola whose foci are (-2, 0) and (2,0) and eccentricity is 2 is given by

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

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

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

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

Answer: B

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121. If the distance between the foci of a hyperbola is 16 and its eccentricity is $\sqrt{2}$, then obtain its equation.

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

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

C. $2x^2 - 3y^2 = 7$

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

Answer: A

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122. The equation of hyperbola whose coordinates of the foci are $(\pm 8, 0)$ and the length of latus rectum is 24 units is _

A. $3x^2 - y^2 = 48$

B. $4x^2 - y^2 = 48$

C. $x^2 - 3y^2 = 48$

D. $x^2 - 4y^2 = 48$

Answer: A

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123. The foci of the hyperbola

$16x^2 - 9y^2 - 64x + 18y - 90 = 0$ are

A. $\left(\frac{24 \pm 5\sqrt{145}}{12}, 1\right)$

B. $\left(\frac{21 \pm 5\sqrt{145}}{12}, 1\right)$

C. $\left(1, \frac{24 \pm 5\sqrt{145}}{2}, 1\right)$

D. $\left(1, \frac{21 \pm 5\sqrt{145}}{2}\right)$

Answer: A

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124. If $\frac{x^2}{36} - \frac{y^2}{k^2} = 1$ is a hyperbola then which of the following statement is true.

A. $(-2, 1)$ lies on the hyperbola

B. $(3, 1)$ lies on the hyperbola

C. $(10, 4)$ lies on the hyperbola

D. $(5, 2)$ lies o the hyperbola

Answer: C

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125. The equation $\frac{x^2}{12-k} + \frac{y^2}{8-k} = 1$ represents a hyperbola if

A. a hyperbola is $k < 8$

B. an ellipse if $k > 8$

C. a hyperbola if $8 < k < 12$

D. None of these

Answer: C

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126. Which of the followig is the equation of a hyperbola ?

A. $x^2 - 4x + 16y + 17 = 0$

B. $4x^2 + 4y^2 - 16x + 4y - 60 = 0$

C. $4x^2 + 4y^2 + 4x + 2y - 27 = 0$

D. $x^2 - y^2 + 3x - 2y - 43 = 0$

Answer: D

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127. The length of transverse axis of the hyperbola $3x^2 - 4y^2 = 32$ is

A. $\frac{8\sqrt{2}}{\sqrt{3}}$

B. $\frac{16\sqrt{2}}{\sqrt{3}}$

C. $\frac{3}{32}$

D. $\frac{64}{3}$

Answer: A

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128. The directrix of the hyperbola $\frac{x^2}{9} - \frac{y^2}{4} = 1$ is

A. $x = 9\sqrt{13}$

B. $y = \frac{9}{\sqrt{13}}$

C. $x = 6\sqrt{13}$

D. $y = \frac{6}{\sqrt{13}}$

Answer: A

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129. The eccentricity of the conic $x^2 - 4y^2 = 1$ is

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

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

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

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

Answer: D

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130. The eccentricity of the hyperbola $\frac{\sqrt{1999}}{3}\left(x^2-y^2\right)=1$, is

A. $\sqrt{3}$

B. $\sqrt{2}$

C. 2

D. $2\sqrt{2}$

Answer: B

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131. Eccentricity of the hyperbola passing through (3,0) and $\left(3\sqrt{2}, 2\right)$ 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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132. The eccentricity of the hyperbola whose length of the latus rectum is equal to 8 and the length of its conjugate axis is equal to half of the distance between its foci, is : (1) $\frac{4}{3}$ (2) $\frac{4}{\sqrt{3}}$ (3) $\frac{2}{\sqrt{3}}$ (4) $\sqrt{3}$

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

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

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

D. $\sqrt{3}$

Answer: C

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133. If the eccentricity of the hyperbola $\frac{x^2}{a^2} - \frac{y^2}{9} = 1$ and $\frac{y^2}{b^2} - \frac{x^2}{a^2} = 1$ are e_1 and e_2 respectively then prove that :

$$\frac{1}{e_1^2} + \frac{1}{e_2^2}$$

A. 1

B. 2

C. 3

D. 4

Answer: A

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134. The difference of the focal distance of any point on the hyperbola $9x^2 - 16y^2 = 144,$ is

A. 8

B. 7

C. 6

D. 4

Answer: A

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135. The distance between two directrices of a rectangular hyperbola is 10 units. Find the distance between its foci.

A. $10\sqrt{2}$

B. 5

C. $5\sqrt{2}$

D. 20

Answer: D

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136. IF t is a parameter, then $x = a\left(t + \frac{1}{t}\right)$ and $y = b\left(t - \frac{1}{t}\right)$ represents

A. an ellipse

B. a circle

C. a pair of straight lines

D. A hyperbola

Answer: D

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137. $x^2, \ -4y^2 - 2x + 16y - 40 = 0$ reprsents

A. a pair of straight lines

B. an ellipse

C. a hyperbola

D. a parabola

Answer: C

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138. The locust of the point of intersection of lines $\sqrt{3}x - y - 4\sqrt{3k}$=0 and $\sqrt{2}kx + ky - 4\sqrt{3} = 0$ for different value of k is a hyperbola whose eccentricity is 2.

A. circle

B. parabola

C. hyperbola

D. ellipse

Answer: C

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139. The line segment joining the foci of the hyperbola $x^2-y^2+1=0$ is one of thediameters of a circle. The equation of the circle is

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

B. $x^2+y^2=\sqrt{2}$

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

D. $x^2+y^2=2\sqrt{2}$

Answer: C

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140. If the foci of the ellipse $\frac{x^2}{16}+\frac{y^2}{b^2}=1$ and the hyperbola $\frac{x^2}{144}-\frac{y^2}{81}=\frac{1}{125}$ coincide, the find the value of b^2.

A. 1

B. 5

C. 7

D. 9

Answer: C

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141. Let the eccentricity of the hyperbola $\frac{x^2}{a^2} - \frac{y^3}{b^2} = 1$ be reciprocal to that of the ellipse $x^2 + 9y^2 = 9$, then the ratio $a^2 : b^2$ equals

A. $8:1$

B. $1:8$

C. $9:1$

D. $1:9$

Answer: A

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142. Let the eccentricity of the hyperbola $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$ be the reciprocal to that of the ellipse $x^2 + 4y^2 = 4$. If the hyperbola passes through a focus of the ellipse, then the equation of the hyperbola, is

A. $(2, 0)$

B. $(0, 2)$

C. $(3, 0)$

D. $(0, 3)$

Answer: A

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143. The length of the straight line $x - 3y = 1,$ intercept by the hyperbola $x^2 - 4y^2 = 1$ is

A. $\sqrt{10}$units

B. $\frac{6}{5}$ units

C. $\frac{1}{\sqrt{10}}$ units

D. $\frac{6}{5}\sqrt{10}$ units

Answer: D

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144. The locue of the mis-points of the chords of the circel $x^2 + y^2 + 2x - 2y - 2 = 0$ which make an angle of 90° at the

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

Answer: C

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145. If $x + y + k = 0$ touches the circle $x^2 + y^2 - 2x - 4y + 3 = 0,$ then k can be

A. $-1, 5$

B. $1, \ -5$

C. $1, 5$

D. $-1, \ -5$

Answer: D

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146. If the lines $3x - 4y + 4 = 0adn6x - 8y - 7 = 0$ are tangents to a circle, then find the radius of the circle.

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

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

C. $\frac{1}{10}$

D. $\frac{1}{20}$

Answer: B

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147. From the point A(0,3) on the circle $x^2 + 4x + (y-3)^2 = 0$ a chord AB is drawn to a point such that AM = 2AB. The equation of the locus of M 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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148. For any $a \in R,$ then locus $x^2 + y^2 - 2ay + a^2 = 0$ touches the line

A. $x = y$

B. $x = 0$

C. $x + y = 0$

D. None of these

Answer: B

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149. The equation of a diameter of circle $x^2 + y^2 - 6x + 2y = 0$, passing through origin is

A. $x + 3y = 0$

B. $x - 3y = 0$

C. $3x + y = 0$

D. $3x - y = 0$

Answer: A

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150. The centres of those circles which touch the circle $x^2 + y^2 - 8x - 8y - 4 = 0$ externally and also touch the x - axis, lie on

A. a circle.

B. an ellipse which is not a circle.

C. a hyperbola.

D. a parabola.

Answer: D

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151. Let A be the centre of the circle $x^2 + y^2 - 2x - 4y - 20 = 0$ .The tangents at the points B(1,7) and C(4,-2) on the circle meet at the point D .If Δ denotes the area of the quadrilateral ABCD,then $\frac{\Delta}{25}$ is equal to

A. 150 sq. units

B. 50 sq. units

C. 75 sq. units

D. 70 sq. units

Answer: C

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152. Let the orthocentre and centroid of a triangle be $(-3, 5)$ and $B(3, 3)$ respectively. If C is the circumcentre of the

triangle then the radrus of the circle having line segment AC as diameter, is

A. $2\sqrt{10}$

B. $\sqrt[3]{\frac{5}{2}}$

C. $\frac{3\sqrt{5}}{2}$

D. $\sqrt{10}$

Answer: B

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153. The equation of a parabola which passes through the point of intersection of a straight line $x + y = 0$ and the circel $x^2 + y^2 + 4y = 0$ is

A. $y^2 = 4x$

B. $y^2 = x$

C. $y^2 = 2x$

D. None of these

Answer: C

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154. Let the equation of an ellipse be $\frac{x^2}{144} + \frac{y^2}{25} = 1$. Then the radius of the circle with centre $\left(0, \sqrt{2}\right)$ and passing through the foci of the ellipse is _

A. 9

B. 7

C. 11

D. 5

Answer: C

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155. The lines $y = 2x + \sqrt{76}$ and $2y + x = 8$touch the ellipse $\frac{x^2}{16} + \frac{y^2}{12} = 1$. If the point of intersection of these two lines lie on a circle, whose centre coincides with the centre of that ellipse, then the equation of that circle is

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

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

C. $x^2 + y^2 = 28$

D. $x^2 + y^2 = \left(4 + \sqrt{8}\right)^2$

Answer: C

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156. A bar of given length moves with its extremities on two fixed straight lines at right angles. Show that any point on the bar describes an ellipse.

A. Circle

B. parabola

C. Ellipse

D. Hyperbola

Answer: C

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157. 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. $2\sqrt{3}$

Answer: B

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158. Tangents are drawn to the hyperbola $4x^2 - y^2 = 36$ at the points P and Q. If these tangents intersect at the point T(0,3) then the area (in sq units) of $\triangle PTQ$ is

A. $54\sqrt{3}$

B. $60\sqrt{3}$

C. $36\sqrt{5}$

D. $45\sqrt{5}$

Answer: D

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EVALUATION TEST

1. The equation of a circle with origin as centre and passing through the vertices of an equilateral triangle whose median is of length 3 a is

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

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

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

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

Answer: C

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2. If one end of the diameter is (1, 1) and the other end lies on the line $x + y = 3$, then find the locus of the center of the circle.

A. $x + y = 1$

B. $2(x - y) = 5$

C. $2x + 2y = 5$

D. None of these

Answer: C

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3. 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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4. The abscissa of two points A and B are the roots of the equation $x^2 + 2ax - b^2 = 0$ and their ordinates are the roots of

the equation $y^2 + 2py - q^2 = 0$. The equation of the circle with AB as 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. None of these

Answer: A

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5. A circle is inscribed in an equilateral triangle of side a. The area of any square inscribed in this circle is (A) $\frac{a^2}{12}$ (B) $\frac{a^2}{6}$ (C) $\frac{a^2}{3}$ (D) $2a^2$

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

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

C. $\frac{a^2}{6}$

D. $\frac{a^2}{12}$

Answer: C

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6. On the parabola $y = x^2$, the point least distance from the straight line y =2x -4 ` is

A. $(1, 1)$

B. $(1, 0)$

C. $(1, -1)$

D. $(0, 0)$

Answer: A

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7. The equation of a circle passing through the vertex and the extremites of the latus rectum of the parabola $y^2 = 8x$ is

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

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

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

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

Answer: C

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

Answer: A

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9. Tht line L passes through the points f intersection of the circles $x^2 + y^2 = 25$ and $x^2 + y^2 - 8x + 7 = 0$. The length of perpendicular from center of second circle onto the line L is

A. 4

B. 3

C. 1

D. 0

Answer: D

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10. 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. 3

C. $\sqrt{12}$

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

Answer: A

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11. Let the eccentricity of the hyperbola $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$ be the reciprocal to that of the ellipse $x^2 + 4y^2 = 4$. If the hyperbola passes through a focus of the ellipse, then the equation of the hyperbola, is

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

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

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

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

Answer: B

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12. An ellipse drawn by taking a diameter of the circle $(x-1)^2+y^2=1$ as its semiminor axis and a diameter of the circle $x^2+(y-2)^2=4$ as its semi-major axis. If the centre of the ellipse is at the origin and its axes are the coordinate axes, then the equation of the ellipse is

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

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

C. $4x^2+y^2=8$

D. $x^2+4y^2=16$

Answer: D

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13. The circle $x^2 + y^2 = 4x + 8y + 5$ intersects the line $3x - 4y = m$ at two distinct points, if (a)-85 lt m lt-35 (c) 15 lt m lt 65 (b)-35 lt m lt 15 (d) 35 lt m lt 85

A. $-35 < m < 15$

B. $15 < m < 65$

C. $35 < m < 85$

D. $-85 < m < -35$

Answer: A

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14. Three distinct points A, B and C are given in the 2-dimensional coordinate plane such that the ratio of the distance of any one of them from the point $(1, 0)$ to the distance from

the point $(-1, 0)$ is equal to $1:3$. Then the circumcentre of the triangle ABC is at the point (1) $(0, 0)$ (2) $\left(\frac{5}{4}, 0\right)$ (c) $\left(\frac{5}{2}, 0\right)$ (d) $\left(\frac{5}{3}, 0\right)$

A. $(0, 0)$

B. $\left(\frac{5}{4}, 0\right)$

C. $\left(\frac{5}{2}, 0\right)$

D. $\left(\frac{5}{3}, 0\right)$

Answer: B

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15. The ellipse $x^2 + 4y^2 = 4$ is inscribed in a rectangle aligned with the coordinate axes, which in turn is inscribed in another ellipse that passes through the point (4, 0). Then the equation of

the ellipse is (1) $x^2 + 16y^2 = 16$ (2) $x^2 + 12y^2 = 16$ (3) $4x^2 + 48y^2 = 48$ (4) $4x^2 + 64y^2 = 48$

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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16. 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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17. The sum of the minimum distance and the maximum distnace from the point $(4, -3)$ to the circle $x^2 + y^2 + 4x - 10y - 7 = 0$ is

A. 20

B. 12

C. 10

D. 16

Answer: A

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18. Let $f(x, y) = 0$ be the equation of a circle. If $f(0, \lambda) = 0$ has equal roots $\lambda = 1, 1$ and $f(\lambda, 0) = 0$ has roots $\lambda = \frac{1}{2}, 2,$ then the centre of the circle is

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

B. $\left(\frac{5}{4}, 1\right)$

C. $(5, 4)$

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

Answer: B

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19. The distance between the vertex of the parabola $y = x^2 - 4x + 3$ and the centre of the circle $x^2 = 9 - (y - 3)^2$ is.

A. $2\sqrt{3}$

B. $3\sqrt{2}$

C. $2\sqrt{2}$

D. $2\sqrt{5}$

Answer: D

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20. Let a circle touches to the directrix of a parabola $y^2 = 2ax$ has its centre coinciding with the focus of the parabola. Then the point of intersection of the parabola and circle is

A. $(a, -a)$

B. $(a/2, a/2)$

C. $(a/2, \pm a)$

D. $(\pm a/a/2)$

Answer: C

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21. Through the vertex 'O' of parabola $y^2 = 4x$, chords OP and OQ are drawn at right angles to one another. Show that for all positions of P, PQ cuts the axis of the parabola at a fixed point. Also find the locus of the middle point of PQ.

A. $y^2 = x + 8$

B. $y^2 = -2 + 8$

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

D. $y^2 = x - 8$

Answer: C

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22. 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. $2\sqrt{2}$

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

D. 4

Answer: A

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23. The line passing through the extremity A of the major exis and extremity B of the minor axis of the ellipse $x^2 + 9y^2 = 9$ meets is auxiliary circle at the point M. Then the area of the triangle with vertices at $A, M,$ and O (the origin) is 31/10 (b) 29/10 (c) 21/10 (d) 27/10

A. $\frac{31}{10}$

B. $\frac{29}{10}$

C. $\frac{21}{10}$

D. $\frac{27}{10}$

Answer: D

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24. In an ellipse, if the lines joining focus to the extremities of the minor axis form an equilateral triangle with the minor axis, then the eccentricity of the ellipse is

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

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

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

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

Answer: A

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25. If the area of the auxiliary circle of the ellipse $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1(a>b)$ is twice the area of the ellipse, then the eccentricity of the ellipse is

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

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

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

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

Answer: B

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26. If A and B are two fixed points and P is a variable point such that $PA+PB=4$, the locus of P is

A. parabola

B. ellipse

C. hyperbola

D. None of these

Answer: B

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27. If A and B are two fixed points and P is a variable point such that $PA + PB = 4$, the locus of P is

A. hyperbola

B. circle

C. parabola

D. ellipse

Answer: B

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28. 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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