MATHS

BOOKS - HIMALAYA MATHS (KANNADA ENGLISH)

CIRCLES

Question Bank

1. The centre of the circle $7x^2 + 7y^2 - 3x + 5y - 8 = 0$ is

A. $\left(\frac{7}{3}, \frac{5}{7}\right)$

B. $\left(-\frac{7}{3}, \frac{-7}{5}\right)$

C. $\left(\frac{3}{7}, \frac{-5}{7}\right)$

D. $\left(\frac{3}{14}, \frac{-5}{14}\right)$

Answer: D

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2. Radius of the circle $16x^2 + 16y^2 - 8x + 32y - 257 = 0$ is

A. 6

B. 5

C. 9

D. none of these

Answer: D

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3. Radius of the circle $x^2 + y^2 + 4x - 8y - 29 = 0$ is

A. 7

B. 5

C. 3

D. 4

Answer: A

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

is

A. 4

B. 6

C. 20

D. $\sqrt{20}$

Answer: D

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5. If the radius of the circle $x^2 + y^2 - 2x + 3y + k = 0$ is $\frac{5}{2}$, then $k =$

A. -3

B. 3

C. 2

D. -2

Answer: A

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6. The value of p for which the equation $7x^2 + py^2 - 5x + 7y - 3 = 0$ represents a circle is

A. -7

B. 6

C. 5

D. none of these

Answer: D

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7. If $x^2 + y^2 - 14x + by + 53 = 0$ represents a point circle then $b =$

A. ±2

B. ±4

C. ±3

D. ±1

Answer: B

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8. If one end of the diameter of the circle $x^2 + y^2 - 4x - 2y - 5 = 0$ is $(3, 4)$, the coordinates of the other end are

A. (-1,2)

B. (1,2)

C. (1,-2)

D. (-1,-2)

Answer: C

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9. The centre of the circle $(x - 2)(x - 4) + (y - 1)(y + 3) = 0$ is

A. (3,2)

B. (3,-1)

C. (3,1)

D. (1,3)

Answer: B

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10. The circum circle of the trianglt with vertices (0,0),(4,0) and (0,3) is

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

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

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

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

Answer: A

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11. The equation of the circle passing through the point (0,0) and the points where the line $3x + 4y = 12$ meet the axes of the coordinates are

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

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

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

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

Answer: A

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12. If $x = 7$ touches the circle $x^2 + y^2 - 4x - 6y - 12 = 0$ then the coordinates of the point of contact is

A. (7,3)

B. (7,4)

C. (7,8)

D. (7,2)

Answer: A

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13. The circle $x^2 + y^2 - 6x - 8y + 9 = 0$ touches externally a circle with the centre at origin. Then the radius of the second circle is

A. I

B. 16

C. 21

D. none of these

Answer: A

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14. A circle of radius 2 units lies in the first qudrant touching both the axes. Then the equation of the circle with

centre (6,5) and touching the above circle externally is

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

B. $x^2 + y^2 - 12x - 10y + 32 = 0$

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

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

Answer: C

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15. The equation of the circle of radius one unit touching both the axes and lying in the second rant is

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

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

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

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

Answer: A

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16. The equation of the diameter of the circle $x^2 + y^2 + 6x - 4y - 2 = 0$, passing through the point (2,-3) is

A. $x + 3y + 7 = 0$

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

C. $6x + 3y - 3 = 0$

D. $x + y + 1 = 0$

Answer: D

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17. The equation of the circle with centre (3,2) touching y - axis is

A. $x^2 + y^2 + 6x + 4y - 3 = 0$

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

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

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

Answer: B

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18. The equation of two circles which touch the Y-axis at (0, 3) and make an intercept of 8 units on X-axis are

A. $x^2 + y^2 + 10x - 6y + 9 = 0$

B. $x^2 + y^2 - 10x - 6y + 9 = 0$

C. both (a) and (b)

D. none uf these

Answer: C

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19. The equation of the circle touching the y -axis at the origin and passing through (b, c) is

A. $b\left(x^2-y^2\right)=x\left(b^2-c^2\right)$

B. $b\left(x^2-y^2\right)=x\left(b^2+c^2\right)$

C. $b\left(x^2+y^2\right)=x\left(b^2+c^2\right)$

D. $b\left(x^2+y^2\right)=x\left(b^2-c^2\right)$

Answer: C

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20. The equation of the circle with centre (2,-3) and touching the y -axis is

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

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

C. $x^2 + y^2 - 4x + 6y + 9 = 0$

D. none of these

Answer: C

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21. The equation of the circle in the first quadrant touching each co-ordinate axis at a distance of one unit from the origin is:

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

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

C. $(x)+2\Big)^2+(j+2)^2=2^2$

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

Answer: D

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22. If two lines $3x-2y-8=0$ and $2x-y-5=0$ lie along two diameters of a circle which touches the x -axis then the equation of the circle is

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

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

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

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

Answer: C

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23. Find the equation of the circle passing through $(0, 0)$ and making intercept a and b on the coordinates axes.

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

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

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

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

Answer: B

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24. The equation of the circle concentric with the circle $x^2 + y^2 + 4x - 2y + 3 = 0$ and passing thro (-2,-3) is

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

B. $x^2 + y^2 + 4x - 2y - 11 - 0$

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

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

Answer: B

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25. The ltngth of the tangtnt to the circle $x^2 + y^2 - 2x - y - 7 = 0$ at (-1,-3) is

A. 8

B. $\sqrt{8}$

C. $2\sqrt{3}$

D. -8

Answer: B

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26. P is any point on the line $x - y = 0$ for which the ltngths of tangtnts to the circleS $x^2 + y^2 + 2\lambda x + 5 = 0$ and $x^2 + y^2 + 2\lambda y + b = 0$ are t_1 and t_2 If $t_1 = 3$ then t_2 is

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

B. 3

C. 6

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

Answer: B

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27. If $2y + x + 3 = 0$ touches the circle $5x^2 + 5y^2 = k$ then $k =$

A. 4

B. 9

C. 16

D. 25

Answer: B

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28. The equation of the diameter of the circle $x^2 + y^2 + 6x - 4y - 2 = 0$, passing through the point (2,-3) is

A. $y = m(x + 4) \pm 7\sqrt{1 + m^2} + 3$

B. $y = m(x - 4) \pm 7\sqrt{1 + m^2} - 3$

C. $y = m(x - 4) \pm 7\sqrt{1 + m^2} + 3$

D. $y = m(x + 4) \pm 7\sqrt{1 + m^2} - 3$

Answer: A

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29. The number of tangtnts from (1,2) to the circle $x^2 + y^2 - 2x - 4y + 4 = 0$ is

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

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

C. 1,2

D. 3,0

Answer: A

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30. The equation of the circle having radius 3 and touching the circle $x^2 + y^2 - 4x - 6y - 12 = 0$ at (-1,-1) is

A. $\left(\frac{14}{5}, -\frac{17}{5}\right)$

B. $\left(\frac{14}{5}, \frac{17}{5}\right)$

C. $\left(-\frac{14}{5}, -\frac{17}{5}\right)$

D. $\left(-\frac{14}{5}, \frac{17}{5}\right)$

Answer: C

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31. The ltngth of the chord of the circle $x^2 + y^2 - 6x + 4y - 5 = 0$ intercepted by y -axis is

A. 3

B. 6

C. 8

D. 4

Answer: B

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32. The circles $x^2 + y^2 + 4x + 6y + 3 = 0$ and $2(x^2 + y^2) + 6x + 4y + c = 0$ will cut orthogonally if c is :

A. (4,-1)

B. (-5,5)

C. (1,-1)

D. (1,1)

Answer: D

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33. The circleS orthogonal to three circleS $x^2 + y^2 + a_i x + b_i y + c = 0, i = 1, 2, 3,$ is

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

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

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

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

Answer: B

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34. Find the equation of the circle with centre at $(1, -2)$ and passing through the centre of the circle $x^2 + y^2 - 4x + 1 = 0$

A. 1

B. 2

C. $\sqrt{2}$

D. $\sqrt{6}$

Answer: D

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35. Two circleS of equal radius ' r ' cut orthogonally. If their centres are (2,3) and $(5, 6)$, then $r =$

A. 1

B. 2

C. 3

D. 4

Answer: C

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36. The points (0,0),(1,0),(0,1) and (t, t) are concyclic then $t =$

A. -1

B. 1

C. 2

D. -2

Answer: B

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37. The equation of a diameter of the circle $x^2 + y^2 = 2ay$ that is perpendicular to the straight line x + 2y = 4 is :

A. $2x - y - a = 0$

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

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

D. $2x - y - 2a = 0$

Answer: D

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38. The equation of the chord of the circle $x^2 + y^2 - 2x - 4y - 20 = 0$ whose mid point is (1,3) is

A. $x + y - 4 = 0$

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

C. $y - 3 = 0$

D. $x - 1 = 0$

Answer: C

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39. The common chord of $x^2 + y^2 = 16$ and $x^2 + y^2 - 4x - 4y = 0$ subtends at the origin an angle equal to

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

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

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

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

Answer: D

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40. If the circles $x^2 + y^2 + 2x + 2ky + 6 = 0$ and $x^2 + y^2 + 2ky + k = 0$ intersect orthogonally , then k is :

A. 0

B. 4

C. 8

D. none of these

Answer: B

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41. If the circles $x^2 + y^2 + 2x + 2ky + 6 = 0$ and $x^2 + y^2 + 2ky + k = 0$ intersect orthogonally , then k is :

A. -2

B. -1

C. 3

D. none of these

Answer: B

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42. The radical axis of the circleS $x^2 + y^2 + 4x = 1$ and $4x^2 + 4y^2 = 9$ is

A. $16x = 5$

B. $16x + 5 = 0$

C. $x = 2$

D. $x + 2 = 0$

Answer: B

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43. If $2x - 4y = 9$ and $6x - 12y + 7 = 0$ are common tangtnts to a circle, then radius of the circle is

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

B. $\frac{17}{6\sqrt{5}}$

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

D. $\frac{17}{3\sqrt{5}}$

Answer: B

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44. The lines 3x - 4y + 4 = 0 and 6x - 8y - 7 = 0 are tangents to the same circle. The radius of the circle is :

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

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

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

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

Answer: B

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45. The line $3x - 2y = k$ meets the circle $x^2 + y^2 = 4r^2$ at only one point if $k^2 =$

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

B. $x^2 + y^2 + 3x + 3y - a^2 + 9 - 0$

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

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

Answer: A

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46. The equation of the circle described on the common chord of circles $x^2 + y^2 - 8x + y - 15 = 0$ and $x^2 + y^2 - 4x + 4y - 42 = 0$ as diameters is :

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

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

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

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

Answer: D

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47. Form the differential equation of the family of circles touching the y- axis at origin.

A. $y = x$

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

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

D. $y - x - \frac{1}{2}$

Answer: D

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48. Equation of the circle having normal at (3,3) as the line $y = x$ and passing through (2,2) is

A. $x^2 + y^2 - 5x + 5y + 12 = 0$

B. $x^2 + y^2 - 5x - 5y + 12 = 0$

C. $x^2 + y^2 + 5x - 5y + 12 = 0$

D. $x^2 + y^2 + 5x + 5y + 12 = 0$

Answer: B

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49. The line $y = x$ is a tangtnt at (0,0) to a circle of radius unity. The centre of the circle is

A. 1)(1,0)

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

C. 3)`(-(1)/(sqrt(2)), (1)/(sqrt(2)))

D. 4)$\left(-\frac{1}{\sqrt{2}}, -\frac{1}{\sqrt{2}}\right)$`

Answer: C

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50. The length of the common chord of two circleS of radii 15 and 20 and whose centres are 25 units apart is

A. 24

B. 25

C. 15

D. 20

Answer: A

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51. The equation of the circle whose radius is 5 and which passes throngh the points on x -axis at distance 3 from the origin is

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

B. $x^2 + y^2 \pm 8y + 9 = 0$

C. $x^2 + y^2 + 8y \pm 90$

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

Answer: A

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52. The equation of the circle passing through $(2a, 0)$ and whose radical axis w.r.t the circle $x^2 + y^2 = a^2$ is $x = \frac{a}{2}$ is

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

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

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

D. none of these

Answer: C

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53. The radical axis of the circleS $x^2 + y^2 + 4x = 1$ and $4x^2 + 4y^2 = 9$ is

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

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

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

D. none of these

Answer: B

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54. The radical axis of the circleS $x^2 + y^2 + 4x = 1$ and $4x^2 + 4y^2 = 9$ is

A. $x^2 + y^2 + 8x - 14y - 9 = 0$

B. $x^2 + y^2 - 8x + 14y + 9 = 0$

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

D. $x^2 + y^2 + 5x - 9y - 1 = 0$

Answer: A

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55. The radical centre of the three circleS deseribed on the three sides of a trianglt as diameter is

A. orthocenter

B. circumcentre

C. incentre

D. centroid

Answer: A

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56. A circle passes through the point of intersection of the line $x = 0$ and the circle $x^2 + y^2 + 2x = 3$. If this passes through $\left(\sqrt{3}, 0\right)$ then its centre is

A. (0,0)

B. (0,1)

C. (1,0)

D. (1,1)

Answer: A

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57. If $2x - 3y = 0$ is the equation of the common chord of the circleS $x^2 + y^2 + 4x = 0$ and $x^2 + y^2 + 2\lambda y = 0$ then $\lambda =$

A. 3

B. 2

C. 1

D. 0

Answer: A

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58. The number of tangtnts from (1,2) to the circle $x^2 + y^2 - 2x - 4y + 4 = 0$ is

A. 1

B. 2

C. 3

D. 0

Answer: D

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59. If the circleS $x^2 + y^2 - 6x - 8y + c = 0$ and $x^2 + y^2 = 9$ have three common tangtnts then $c =$

A. 18

B. 19

C. 20

D. 21

Answer: D

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60. The ltngth of the tangtnt to the circle $x^2 + y^2 - 2x - y - 7 = 0$ at (-1,-3) is

A. 20

B. 16

C. 49

D. 10

Answer: D

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61. The number of common tangtnts to the circleS $x^2 + y^2 + 2x + 8y - 23 = 0$ and $x^2 + y^2 - 4x - 10y + 19 = 0$ is

A. 1

B. 2

C. 3

D. 4

Answer: C

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62. If two circleS $x^2 + y^2 = 4$ and $x^2 + y^2 - 24x - 10y + a^2 = 0$ have exactly two common tangtnts then the number of possiblt values of a is, (where $a \in I$)

A. 11

B. 13

C. 0

D. 2

Answer: B

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63. The abscissa of two points A and B are the roots of $x^2 - 4x + 2 = 0$ and their ordinates are the roots of $x^2 + 6x - 3 = 0$. The equation of the circle with AB as diameter is

A. $x^2 + y^2 + 4x - 6y + 1 = 0$

B. $x^2 + y^2 - 4x - 6y + 1 = 0$

C. $x^2 + y^2 - 4x + 6y - 1 = 0$

D. $x^2 + y^2 + 4x + 6y + 1 - 0$

Answer: C

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64. The image of the circle $x^2 + y^2 - 2x = 0$ in the line $x + y = 2$ is the circle

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

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

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

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

Answer: D

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65. The ltngth of the chord of the circle $x^2 + y^2 - 6x + 4y - 5 = 0$ intercepted by y -axis is

A. $x^2 + y^2 + 4x + 6y + 7 = 0$

B. $x^2 + y^2 - 4x - 6y + 7 = 0$

C. $x^2 + y^2 + 4x - 6y + 7 = 0$

D. none of these

Answer: B

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66. Image of the circle $x^2 + y^2 + 16x + 18y + 85 = 0$ in the y -axis is

A. $x^2 + y^2 - 16x - 18y + 85 = 0$

B. $x^2 + y^2 - 16x + 18y + 85 = 0$

C. $x^2 + y^2 + 16x - 18y + 85 = 0$

D. none of these

Answer: B

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67. The equation of a circle with origin as centre and passing through the vertices of an equilateral triangle whose median is of length 3a 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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68. A square in inscribed in the circle $x^2 + y^2 - 2x + 4y - 3 = 0$. Its sides are paralltl to the coordinates axes. Then one of the vertex of the square is

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

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

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

D. nonc of these

Answer: D

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69. The equation to the circle with centre (2, 1) and touching the line $3x + 4y = 5$ is...

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

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

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

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

Answer: C

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70. The line $y = x + a\sqrt{2}$ touches the circle $x^2 + y^2 = a^2$ at the point

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

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

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

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

Answer: A

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71. The equation of a circle is $x^2 + y^2 = 25$. The equation of its chord whose middlt point is (1,-2) is given by

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

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

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

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

Answer: C

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72. The equation of the chord of the circle $x^2 + y^2 - 4x = 0$, whose mid-point is (1, 0) is :

A. $y = 2$

B. $y = 1$

C. $x = 2$

D. $x = 1$

Answer: D

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73. The value of k for which the circles $x^2 + y^2 - 3x + ky - 5 = 0$ and $4x^2 + 4y^2 - 12x - y - 9 = 0$ become concentric is:

A. 1(1)/(8)`

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

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

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

Answer: D

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74. Two tangents to the circle $x^2 + y^2 = 4$ at the points A and B meet at P (- 4, 0). Then the area of the quadrilateral PAOB, O being the origin, is :

A. 4

B. $4\sqrt{3}$

C. $6\sqrt{2}$

D. $2\sqrt{3}$

Answer: B

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75. The locus of the centre of the circle in which the chord joining the points (1,2) and (2,-1) subtends an anglt $\frac{\pi}{4}$ at any point on the circumference is

A. 1)$x^3y^2 - 3xy = 0$

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

C. 3)$x^2 + y^2 - 6x - 2y + 5 = 0$

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

Answer: A

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76. The tangents drawn from the origin to the circle : $x^2 + y^2 - 2gx - 2fy + f^2 = 0$ are perpendicular if:

A. $g^2 + f^2 = 1$

B. $g^2 - f^2 = 1$

C. $g^2 - f^2 = 0$

D. $g^2 + f^2 = 0$

Answer: C

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77. Locus of a moving point such that tangents from it to the two circles : $x^2 + y^2 - 5x - 3 = 0$ and $3x^2 + 3y^2 + 2x + 4y - 6 = 0$ are equal, is :

A. $7x + 4y - 3 = 0$

B. $3x - 4y + 9 = 0$

C. $17x + 4y + 3 = 0$

D. $13x - 4y + 15 = 0$

Answer: C

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78. Angle between a pair of tangents drawn from a point P to the circle $x^2 + y^2 + 4x - 6y + 9\sin^2\theta + 13\cos^2\theta = 0$ is 2θ. Then the locus of P is:

A. $x^2 + y^2 + 4x - 6y - 9 = 0$

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

C. $x^2 + y^2 + 4x - 6y + 9 = 0$

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

Answer: C

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79. The condition that the line (x + g) cos θ + (y +f) sin θ = k is a tangent to $x^2 + y^2 + 2gx + 2fy + c = 0$:

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

B. $g^2 + f^2 = c + k$

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

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

Answer: C

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80. The chord of contact of tangents drawn from any point on the circle $x^2 + y^2 = a^2$ to the circle $x^2 + y^2 = b^2$ touches the circle $x^2 + y^2 = c^2$. Then a, b, c are in:

A. A.P

B. $G.\ P$

C. H.P

D. none of these

Answer: B

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81. The chord of contact of tangents drawn from any point on the circle $x^2 + y^2 = a^2$ to the circle $x^2 + y^2 = b^2$ touches the circle $x^2 + y^2 = c^2$. Then a, b, c are in:

A. 16

B. 4

C. 2

D. 8

Answer: D

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82. If $x = 7$ tonches the circle

$x^2 + y^2 - 4x - 6y - 12 = 0$ then the point of contact is

A. (7,3)

B. (7,4)

C. (7,8)

D. (7,2)

Answer: A

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83. The length of the chord joining the points $(4\cos\theta, 4\sin\theta)$ and $\left(4\cos\left(\theta + 60^2\right), 4\sin(\theta + 60^\circ)\right)$ of the circle $x^2 + y^2 = 16$ is

A. 25

B. 12

C. 13

D. 5

Answer: D

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84. The angle between the tangents from the origin to the circle $(x-7)^2+(y+1)^2=25$ is :

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

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

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

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

Answer: C

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85. The equation of the circle having radius 3 and touching the circle $x^2 + y^2 - 4x - 6y - 12 = 0$ at (-1,-1) is

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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86. The Locus of the centre of the circle of radius 3, which rolls on the outside of the circle $x^2 + y^2 + 3x - 6y - 9 = 0$ is :

A. $x^2 + y^2 + 4x - 6y + 13 = 0$

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

C. $x^2 + y^2 + 4x - 6y - 13 = 0$

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

Answer: B

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87. The locus of the mid-points of chords of the circle $x^2 + y^2 = 4$, which subtend a right angle at the origin, is:

A. $x + y = 2$

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

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

D. $x + y = 1$

Answer: B

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88. Let 'C' be the circle with centre (0,0) and radius 3 units. The equation of the locus of the mid points of chords of the circle 'C' that subtend an angle of $2\pi / 3$ at its centre is:

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

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

C. $x^2 + y^2 = \frac{27}{4}$

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

Answer: D

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89. If the line $y = mx$ is outside the circle

$x^2 + y^2 - 20y + 90 = 0$ then

A. $m < 3$

B. $|m| < 3$

C. $m > 3$

D. $|m| > 3$

Answer: B

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90. The number of tangtnts from (1,2) to the circle $x^2 + y^2 - 2x - 4y + 4 = 0$ is

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

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

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

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

Answer: C

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91. A square in inscribed in the circle $x^2 + y^2 - 2x + 4y - 3 = 0$. Its sides are paralltl to the coordinates axes. Then one of the vertex of the square is

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

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

C. $(1, -2 + \sqrt{2})$

D. none of these

Answer: D

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92. The circles $x^2 + y^2 + 6x + k = 0$ and $x^2 + y^2 + 8y - 20 = 0$ touch each other internally. The value of k is

A. 6

B. 9

C. 8

D. 4

Answer: C

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93. The area of the circle $x^2 + y^2 - 2x + 4y - 4 = 0$ is

A. $\frac{340}{41}$ sq. units

B. $\frac{360}{41}$ sq. units

C. $\frac{320}{41}$ sq. units

D. $\frac{310}{41}$ sq. units

Answer: C

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94. The points $(1, 0), (0, 1), (0, 0)$ and $(2k, 3k), k \neq 0$ are concyclic if k =

A. ' a ' can take only rational values

B. ' a " is irrational

C. no real values of ' a ' exists

D. none of these

Answer: A

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95. From any point on the circle $x^2 + y^2 = a^2$, tangtnts are drawn to the circle

$x^2 + y^2 = a^2 \sin^2 \alpha$ The anglt between them is

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

B. α

C. 2α

D. 3α

Answer: C

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96. Angle between tangents drawn from a point on the director circle $x^2 + y^2 = 100$ to the circle $x^2 + y^2 = 50$ is

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

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

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

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

Answer: A

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97. Two tangents drawn from $P(7, 1)$ to the circle $x^2 + y^2 = 25$ touches the circle at Q and R. The area of the quadrilateral $PQOR$ is

A. 25 sq. units

B. 30 sq. units

C. 20 sq. units

D. 10 sq. units

Answer: A

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98. The ltngth of the tangtnt from (5,3) to the circle $x^2 + y^2 + 10x + ky - 17 = 0$ is 7, then $k =$

A. 9

B. -6

C. 10

D. -2

Answer: B

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99. The equation of the tangtnt to the circle $x^2 + y^2 - 2x + 8y - 23 = 0$ having slope 3 is

A. $x + y + 27 = 0$

B. $2x - 3y + 20 = 0$

C. $3x + y - 13 = 0$

D. $3x - y + 13 = 0$

Answer: D

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100. The equation of the circle in the first quadrant touching each co-ordinate axis at a distance of one unit from the origin is:

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

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

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

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

Answer: A

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101. The equation of the circle having centre (1, 2) and passing through the point of intersection of the lines: 3x+y=14 and 2x+5y=18 is :

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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102. The area of the circle centred at (1, 2) and passing through (4,6) is :

A. 5π

B. 10π

C. 25π

D. none of these

Answer: C

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103. Equation of a circle which passes through (3, 6) and touches the axes is:

A. $x^2 + y^2 + 6x + 6y + 3 = 0$

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

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

D. none of these

Answer: C

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104. Equation of the circle with centre on the y-axis and pussing through the origin und the point (2, 3) is :

A. $x^2 + y^2 + 13y = 0.$

B. $3x^2 + 3y^2 + 13x + 3 = 0$

C. $2x^2 + 2y^2 - 13x = 0$

D. $x^2 + y^2 + 13x + 3 = 0$

Answer: C

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105. The equation of a circle with origin as centre and passing through the vertices of an equilateral triangle whose median is of length 3a 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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106. The equation of the circle described on the line joining the points (-2, -1) and (3, 4) as diameter is

A. $x^2 + y^2 + x + 3y + 10 = 0$

B. $x^2 + y^2 - x + 3y + 10 = 0$

C. $x^2 + y^2 - x - 3y - 10 = 0$

D. $x^2 + y^2 + x + 3y - 10 = 0$

Answer: C

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

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

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

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

D. $4(x^2 + y^2 - x - 6y)+1=0$`

Answer: A

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108. The incentre of the triangle with vertices $(1, \sqrt{3}), (0, 0)$ and $(2, 0)$ 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: C

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109. The locus of the centre of a circle which touches externally two given circles is

A. a hyperbola

B. an ellipse

C. a parabola

D. a circle

Answer: A

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110. Given that the circleS $x^2 + y^2 - 2x + 6y + 6 = 0$ and $x^2 + y^2 - 5x + 6y + 15 = 0$ touch, the equation of their common tangtnt is

A. $x = 3$

B. $y = 6$

C. $7x - 12y - 21 = 0$

D. $7x + 12y + 21 = 0$

Answer: A

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111. The locus of the centre of the circle which cuts the circles

$x^2 + y^2 + 2g_1x + 2f_1y + c_1 = 0$

$x^2 + y^2 + 2g_2x + 2f_2y + c_2 = 0$ orthogonally is

A. radical axis of the given circleS

B. a conic section

C. another circle

D. an ellipse

Answer: A

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112. Length of tangent drawn from any point on the circle $x^2 + y^2 + 2gx + 2fy + c = 0$ to the circle : $x^2 + y^2 + 2gx + 2fy + c' = 0$ is :

A. $c_1 + c_2$

B. $c_2 - c_1$

C. $\sqrt{c_1^2 + c_2^2}$

D. $\sqrt{c_2 - c_1}$

Answer: D

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113. The radius of the circle $16x^2 + 16y^2 - 8x + 32y - 256 = 0$ is

A. 8

B. 6

C. 15

D. none of these

Answer: D

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114. The length of the intercept that a circle $x^2 + y^2 + 10x - 6y + 9 = 0$ makes on the x -axis is

A. 2

B. 4

C. 6

D. 8

Answer: D

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115. The radius of the circle $3x(x-2)+3y(y+1)=4$ is

A. $\sqrt{\frac{31}{12}}$

B. $\sqrt{\frac{15}{4}}$

C. 3

D. 2

Answer: A

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116. The equation of the tangtnt to the circle $x^2 + y^2 + 2gx + 2fy + c = 0$ at the origin is

A. $fx + gy = 0$

B. $gx + fy = 0$

C. $x = 0$

D. $y = 0$

Answer: B

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117. The two circles $x^2 + y^2 - 2x + 6y + 6 = 0$ and $x^2 + y^2 - 5x + 6y + 15 = 0$

A. touch each other externally

B. touch each other internally

C. soncentric circleS

D. intersecting types of circleS

Answer: B

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118. The equation of the circle circumscribing the triangle formed by the points (0,0),(1,0) and (0,1) is

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

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

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

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

Answer: D

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119. The circle $x^2 + y^2 - 8x + 4y + 4 = 0$

A. does not touch the axes

B. touches the x -axis

C. touches the y -axis

D. touches both x and y axes

Answer: C

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120. The equation of the circle passing through the points (1, 0) and (0, 1) and having smallest radius is :

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

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

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

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

Answer: C

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121. The tangents drawn from the origin to the circle : $x^2 + y^2 - 2gx - 2fy + f^2 = 0$ are perpendicular if:

A. $p^2 = q^2$

B. $p^2 + q^2 = 1$

C. $p = \frac{q}{2}$

D. $q = \frac{p}{2}$

Answer: A

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122. The circle $x^2 + y^2 - 3x - 4y + 2 = 0$ cuts the x axis at the points

A. (1,0),(2,0)

B. (1,0),(-1,0)

C. (3,0),(4,0)

D. (2,0),(-3,0)

Answer: A

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123. The radical axis of the two circleS and the line of centres of those circleS are

A. perpendicular

B. parallel

C. intersecting but not fully perpendicular

D. neither parallel nor perpendicular

Answer: A

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124. The equation of the tangent to the circle $x^2 + y^2$ + 4x - 4y + 4 = 0 which makes equal intercepts on the positive coordinate axes is:

A. $x + y = 2$

B. $x + y = 2\sqrt{2}$

C. $x + y = 4$

D. $x + y = 8$

Answer: B

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125. If two circle $(x-1)^2 + (y-3)^2 = r^2$ and $x^2 + y^2 - 8x + 2y + 8 = 0$ intersect in two distinct points, then

A. $8 < r < 10$

B. $r < 2$

C. $2 < r < 8$

D. $r = 2$

Answer: C

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126. If $\left(x_i, \frac{1}{x_i}\right)$, i=1,2,3,4 are four distinct points on the circle, then $x_1 . x_2 . x_3 . x_4 =$

A. -1

B. 4

C. 0

D. 1

Answer: D

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127. The line $3x - 2y = k$ meets the circle $x^2 + y^2 = 4r^2$ at only one point if $k^2 =$

A. $52r^2$

B. $20r^2$

C. $\frac{20}{9}r^2$

D. $\frac{52}{9}r^2$

Answer: A

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128. Which of the following is a point on the common chord of the circle $x^2 + y^2 + 2x - 3y + 6 = 0$ and $x^2 + y^2 + x - 8y - 13 = 0$?

A. (1,4)

B. (1,-2)

C. (1,-4)

D. (1,2)

Answer: C

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129. If the circles $x^2 + y^2 + 2gx + 2fy = 0$ and $x^2 + y^2 + 2g'x + 2f'y = 0$ touch each other, then

A. $ff' = gg'$

B. $fg = f'g'$

C. $(f.\ g)^2 =$ (f^(prime) . g^(prime))^2

D. $fg' = f'g$

Answer: D

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130. The circle $x^2 + y^2 - 8x + 4y + 4 = 0$

A. x -axis

B. y -axis

C. both the axes

D. neither x nor y axis

Answer: B

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131. The radius of the circle passing through the point (6.2) and two of whose diameters are x + y = 6 and x + 2y = 4 is

A. 4

B. 6

C. 20

D. $\sqrt{20}$

Answer: D

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132. The equation to the circle with centre (2, 1) and touching the line $3x + 4y = 5$ is...

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

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

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

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

Answer: C

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133. The condition for a line $y = 2x + c$ to touch the circle $x^2 + y^2 = 16$ is...

A. $c = 10$

B. $c^2 = 80$

C. $c = 12$

D. $c^2 = 64$

Answer: B

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134. The centre of the circle $x = 2 + 3\cos\theta y = 3\sin\theta - 1$ is ...

A. (3,3)

B. (2,-1)

C. (-2,1)

D. (-1,2)

Answer: B

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

A. $\sqrt{26}$

B. $\sqrt{13}$

C. $\sqrt{23}$

D. 0

Answer: D

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136. The two circles $x^2 + y^2 - 2x + 22y + 5 = 0$ and $x^2 + y^2 + 14x + 6y + k = 0$ intersect orthogonally provided k is equal to...

A. 47

B. -47

C. 49

D. -49

Answer: A

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137. If the length of the tangent from any point on the circle $(x - 3)^2 + (y + 2)^2 = 5r^2$ to the circle

$(x-3)^2+(y+2)^2=r^2$ is 4 units, then the area between the two circles in sq. units is

A. 4π

B. 32π

C. 256π

D. 8π

Answer: C

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138. The circles $ax^2+ay^2+2g_1x+2f_1y+c_1=0$ and $bx^2+by^2+2g_2x+2f_2y+c_2=0$ $(a\neq 0$ and $b\neq 0)$ cut orthogonally if

A. g_(1)g_{2}+f_(1)f_{2} = bc_(1)+ac_(1)

B. g_(1)g_{2}+f_(1)f_{2} = ac_(1)+bc_(2)

C. g_(1)g_{2}+f_(1)f_{2} = c_(1)+c_(2)

D. 2g_(1)g_{2}+2f_(1)f_{2} = bc_(1)+ac_(2)

Answer: D

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139. The equation of the common tangent of the two touching circles, $y^2 + x^2 - 6x - 12y + 37 = 0$ and $x^2 + y^2 - 6y + 7 = 0$ is

A. $x - y + 5 = 0$

B. $x - y - 5 = 0$

C. $x + y + 5 = 0$

D. $x + y - 5 = 0$

Answer: D

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140. If the line $2x + 3y + k = 0$ is a tangtnt to the circle $x^2 + y^2 - 6x - 8y = 0,$ then a value of $k =$

A. $5\sqrt{13} - 18$

B. 7

C. $5 + 8\sqrt{13}$

D. none of these

Answer: A

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141. The area of the circle $x^2 + y^2 - 2x + 4y - 4 = 0$ is

A. 6 pi sq. units

B. 9 pi` sq. units

C. 7 pi` sq, units

D. 16 pi sq. units

Answer: B

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142.

$x^2 + y^2 - 6x - 6y + 4 = 0, x^2 + y^2 - 2x - 4y + 3 = 0,$ $x^2 + y^2 + 2kx + 2y + 1 = 0.$ If the radical centre of the above three circles exists, then which of the following cannot be the value of k?

A. 1

B. 2

C. 4

D. 5

Answer: D

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143. If the circles $x^2 + y^2 - 2x - 2y - 7 = 0$ and $x^2 + y^2 + 4x + 2y + k = 0$ cut orthogonally, then the length of the common chord of the circles is

A. 2

B. $\frac{12}{\sqrt{13}}$

C. 8

D. 5

Answer: B

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144. If two circleS $x^2 + y^2 + 2\lambda x + c = 0$ and $x^2 + y^2 - 2\mu y - c = 0$ have equal radius then the locus of

(λ, μ) is

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

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

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

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

Answer: B

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145. Given that the circle $x^2 + y^2 + 2x - 4y + 4 = 0$ and $x^2 + y^2 - 2x - 4y - 4 = 0$ touch each other the equation of the common tangtnt is

A. $x - 2 = 0$

B. $x + 2 = 0$

C. $y = 0$

D. $y + 1 = 0$

Answer: B

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146. The equation ot the circle concentric with $x^2 + y^2 + 6x + 2y + 1 = 0$ and passing through the point (-2,-1) is

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

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

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

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

Answer: D

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147. The centre of a circle passing through the points (0,0), (1,0) and touching the circle $x^2 + y^2 = 9$ is

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

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

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

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

Answer: D

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148. The equation of the tangent to the circle $x^2 + y^2$ + 4x - 4y + 4 = 0 which makes equal intercepts on the positive coordinate axes is:

A. $x + 4 = 2$

B. $x + y = 2\sqrt{2}$

C. $x + y = 4$

D. $x + y = 8$

Answer: B

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

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: C

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150. If a circle passes through the point (a, b) and cuts $x^2 + y^2 = 4$ orthogonally, then the locus of its centre is :

A. $2ax + 2by + (a^(2)+b^(2)+4) = 0$

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

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

D. $2ax - 2by - (a^(2)+b^(2)+4) = 0$

Answer: B

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151. Locus of centroid of the triangle whose vertices are $(a\cos t, a\sin t), (b\sin t, -b\cos t)$ and (1, 0), where t is a parameter, is :

A. $(3x-1)^2 + (3y)^2 = a^2 + b^2$

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

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

D. $(3x-1)^2+(3y)^2=a^2-b^2$

Answer: A

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152. If two circle $(x-1)^2+(y-3)^2=r^2$ and $x^2+y^2-8x+2y+8=0$ intersect in two distinct points, then

A. $r<2$

B. $r=2$

C. $r>2$

D. $2<r<8$

Answer: D

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153. A variable circle passes through the fixed point A (p, q) and touches x-axis. The locus of the other end of the diameter through A is :

A. $(x-p)^2 = 4qy$

B. $(x-q)^2 = 4py$

C. $(y-p)^2 = 4qx$

D. $(y-q)^2 = 4px$

Answer: A

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154. 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: A

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155. The intercept on the line y = x by the circle $x^2 + y^2 - 2x = 0$ is AB. Equation of the circle on AB as diameter is :

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

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

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

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

Answer: A

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156. If a circle passes through the point (a, b) and cuts $x^2 + y^2 = 4$ orthogonally, then the locus of its centre is :

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

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

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

D. $2ax - 2by - (a^(2)+b^(2)+4) = 0$

Answer: B

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157. If the circles $x^2 + y^2 + 2ax + cy + a = 0$ and $x^2 + y^2 - 3ax + dy - 1 = 0$ intersect in two distinct points P and Q, then the line 5x + by - a = 0 passes through P and Q for :

A. no value of a

B. exactly two values of a

C. infinitely many values of a

D. exactly one value of a (AIEEE 2005)

Answer: A

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158. The equation $x^2 + y^2 + 4x + 6y + 13 = 0$ represents

A. circle

B. a pair of two distinct lines

C. a pair of coincident lines

D. a point

Answer: D

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159. The circleS $x^2 + y^2 - 10x + 16 = 0$ and $x^2 + y^2 = r^2$ intersect each other in distinct points, if

A. $r > 8$

B. $r < 2$

C. $2 < r < 8$

D. $2 \leq r \leq 8$

Answer: C

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160. The triangle PQR is inscribed in the circle $x^2 + y^2 = 25$. If Q and R have coordinates (3, 4) and (- 4, 3) respectively, then $\angle QPR$ is equal to :

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

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

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

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

Answer: C

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161. If the circles $x^2 + y^2 + 2x + 2ky + 6 = 0$ and $x^2 + y^2 + 2ky + k = 0$ intersect orthogonally , then k is :

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

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

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

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

Answer: A

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162. If a > 2b > 0, then the positive value of m for which $y = mx - b\sqrt{1-m^2}$ is a common tangent to $x^2 + y^2 = b^2$ and $(x-a)^2 + y^2 = b^2$ is :

A. $\frac{2b}{\sqrt{a^2-4b^2}}$

B. $\frac{\sqrt{a^2-4b^2}}{2b}$

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

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

Answer: A

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163. If the tangent at a point P on the circle $x^2+y^2+6x+6y=2$, meets the straight line 5x- 2y + 6 = 0 at a point Q on the y-axis, then the length of PQ is:

A. 5

B. $2\sqrt{5}$

C. 5

D. $3\sqrt{5}$

Answer: C

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164. A square is formed by two pairs of straight lines $x^2 - 8x + 12 = 0$ and $y^2 - 14y + 45 = 0$. A circle is inscribed in it. The centre of the circle is:

A. (7,4)

B. (4,7)

C. (6,5)

D. (5,6)

Answer: B

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165. If one of the diameters of the circle $x^2 + y^2 - 2x - 6y + 6 = 0$ is a chord to the circle with centre (2, 1), then the radius of the circles is :

A. $\sqrt{3}$

B. $\sqrt{2}$

C. 3

D. 2

Answer: C

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166. The locus of the centre of a circle which touches externally the circle

$x^2 + y^2 - 6x - 6y + 14 = 0$ and also touches the y -axis is given by the equation

A. $x^2 - 6x - 10y + 14 = 0$

B. $x^2 - 10x - 6y + 14 = 0$

C. $y^2 - 6x - 10y + 14 = 0$

D. $y^2 - 10x - 6y + 14 = 0$

Answer: D

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167. The chord of contact of the pair of tangents drawn from each point on the line $2x + y = 4$ to the circle $x^2 + y^2 = 1$ passes through the point

A. (1,2)

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

C. (2,4)

D. none of these

Answer: B

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168. Two vertices of an equilateral trianglt are (-1,0) and (1,0) and its third vertex is above the x -axis. The equation of its

circum circle is

A. $x^2 + y^2 + \frac{2}{\sqrt{3}}x - 1 = 0$

B. $x^2 + y^2 - \frac{2}{\sqrt{3}}x - 1 = 0$

C. $x^2 + y^2 + \frac{2}{\sqrt{3}}y - 1 < 0$

D. $x^2 + y^2 - \frac{2}{\sqrt{3}}y - 1 = 0$

Answer: D

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169. The length of the tangtnt from (0,0) to the circle $2x^2 + 2y^2$+x-y+5=0` is

A. $\sqrt{5}$

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

C. $\sqrt{2}$

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

Answer: D

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170. Consider the circleS, $x^2 + (y-1)^2 = 9$ (x-1)^(2)+y^(2)=25 .` These are such that

A. they touch each other

B. one circle lies entirely inside the other

C. each circle lies out side the other

D. they intersect in two points

Answer: B

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171. The number of common tangents to the circles $x^2 + y^2 - x = 0$ and $x^2 + y^2 + x = 0$, is

A. 2

B. 1

C. 4

D. 3

Answer: D

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172. The radical centre of the three circleS deseribed on the three sides of a trianglt as diameter is

A. the orthocentre

B. the circumcentre

C. the incentre

D. the centroid

Answer: A

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173. The circle, which passes through the origin and whose centre lies on the line y = x and cutting the circle $x^2 + y^2 - 4x - 6y + 10 = 0$ orthogonally is :

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

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

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

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

Answer: C

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174. The equation of the circle described on the common chord of the circleS $x^2 + y^2 + 2x = 0$ and $x^2 + y^2 + 2y = 0$ as diameter is

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

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

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

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

Answer: D

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175. The equation of the circle which touches the lines $x = 0, y = 0$ and $x = c(c > 0)$ is

A. $x^2 + y^2 - cx - cy + c^2 = 0$

B. $x^2 + y^2 + cx + cy + \frac{c^2}{4} = 0$

C. $x^2 + y^2 - 2cx - 2cy + c^2 = 0$

D. $x^2 + y^2 - cx - cy + \frac{c^2}{4} = 0$

Answer: D

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176. The centre and radius of the circle with the segment of the line $x + y = 1$ cutoff by the coordinate axes as a diameter

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

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

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

D. (0,0), 1

Answer: C

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177. Two circleS of equal radius ' r ' cut orthogonally. If their centres are (2,3) and $(5, 6),$ then $r =$

A. 3

B. 4

C. 6

D. 10

Answer: A

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178. Given that for the circle $x^2 + y^2 - 4x + 6y + 1 = 0$ the line with equation $3x - y = 1$ is a chord. The midpoint

of the chord is

A. $\left(\frac{2}{5}, \frac{11}{5}\right)$

B. $\left(-\frac{2}{5}, \frac{11}{5}\right)$

C. $\left(-\frac{2}{5}, -\frac{11}{5}\right)$

D. $\left(\frac{2}{5}, -\frac{11}{5}\right)$

Answer: C

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179. The equation of the normal to the circle $x^2 + y^2 - 2x - 2y - 2 = 0$ is at the point (3,1) on it is

A. $x = 1$

B. $y = 2$

C. $y = 1$

D. $y = -1$

Answer: C

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180. The locus of the point of intersection of perpendicular tangents to the ellipse is called

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

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

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

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

Answer: A

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181. The equation of a circle with centre (4,1) and having $3x + 4y - 1 = 0$ as tangtnt is

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

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

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

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

Answer: B

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182. The slope of the radical axis of the circleS $x^2 + y^2 + 3x + 4y - 5 = 0$ and $x^2 + y^2 - 5x + 5y - 6 = 0$ is

A. 1

B. 3

C. 5

D. 8

Answer: D

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183. If the circle $x^2 + y^2 + 2x - 2y + 4 = 0$ cuts the circle $x^2 + y^2 + 4x + 2fy + 2$=0 orthogonally then $f =$

A. 1

B. 2

C. -1

D. -2

Answer: C

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184. The centre of the circle touching the y -axis at (0,3) and making an intercept of 2 units on the positive x -axis is

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

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

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

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

Answer: C

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185. A variablt circle passes through the fixed point (2,0) and touches the y -axis. Then the locus of its centre is

A. a parabola

B. a circle

C. an ellipse

D. a hyperbola

Answer: A

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186. The number of circleS that touch all the lines $x + y - 4 = 0, x - y + 2 = 0$ and $y = 2$ is

A. 1

B. 2

C. 3

D. 4

Answer: D

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187. The slope m of a tangtnt through the point (7,1) to the circle $x^2 + y^2 = 25$ satisfies the equation

A. $12m^2 + 7m - 12 = 0$

B. $16m^2 - 24m + 9 = 0$

C. $12m^2 - 7m - 12 = 0$

D. $9m^2 + 24m + 16 = 0$

Answer: C

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188. The number of common tangtnts that can be drawn to the circleS $x^2 + y^2 = 1$ and $x^2 + y^2 - 2x - 6y + 6 = 0$ is

A. 1

B. 2

C. 3

D. 4

Answer: D

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189. Two circleS of equal radius ' r ' cut orthogonally. If their centres are (2,3) and $(5, 6),$ then $r =$

A. 1

B. 2

C. 3

D. 4

Answer: C

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190. The radical axis of the circleS

$x^2 + y^2 + 3x + 4y - 5 = 0$

$x^2 + y^2 - 5x + 5y - 6 = 0$ is

A. $8y - x + 1 = 0$

B. $8x - y + 1 = 0$

C. $8x - 8y + 1 = 0$

D. $y - 8x + 1 = 0$

Answer: B

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191. The equation of the normal to the circle $x^2 + y^2 + 6x + 4y - 3 = 0$ at (1,-2) is

A. $y + 1 = 0$

B. $y + 2 = 0$

C. $y + 3 = 0$

D. $y - 2 = 0$

Answer: B

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192. A line is at a constant distance c from the origin and meets the coordinate axes in A and B. The locus of the centre of the circle passing through O, A, B is

A. $x^{-2} + y^{-2} = c^{-2}$

B. $x^{-2} + y^{-2} = 2c^{-2}$

C. $x^{-2} + y^{-2} = 3c^{-2}$

D. $x^{-2} + y^{-2} = 4c^{-2}$

Answer: D

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193. The four distinct points (0,0),(2,0),(0,-2) and $(k, -2)$ are conclyic if $k =$

A. 2

B. -2

C. 0

D. 1

Answer: A

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194. The radius of the larger circle lying in the first quadrant and touching the line $4x + 3y - 12 = 0$ and the coordinate axes is

A. 5

B. 6

C. 7

D. 8

Answer: B

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195. The equation of the circle of radius 5 and touching the coordinate axes in the third quadrant is

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

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

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

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

Answer: B

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196. If $2x - 4y = 9$ and $6x - 12y + 7 = 0$ are common tangtnts to a circle, then radius of the circle is

A. 1

B. 2

C. 4

D. 6

Answer: A

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197. If P is a point such that the ratio of the squares of the ltngths of the tangtnts from P to the circleS $x^2 + y^2 + 2x - 4y - 20 = 0$ and $x^2 + y^2 - 4x + 2y - 44 = 0$ is $2:3,$ then the locus of P is a circle with centre

A. (7,-8)

B. (-7,8)

C. (7,8)

D. (-7,-8)

Answer: B

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198. If the circle $x^2 + y^2 + 6x - 2y + k = 0$ bisects the circumference of the circle $x^2 + y^2 + 2x - 6y - 15 - 0$ then $k =$

A. 21

B. -21

C. 23

D. -23

Answer: D

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199. A line l meet the circle $x^2 + y^2 = 61$ in A and B and $P(-5, 6)$ is such that $PA = PB = 10$. Then the

equation of l is

A. $5x + 6y + 11 = 0$

B. $5x - 6y - 11 = 0$

C. $5x - 6y + 11 = 0$

D. $5x - 6y + 12 - 0$

Answer: C

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200. If the line $3x - 2y + 6 = 0$ meets x -axis and y -axis respectively at A and B, then the equation of the circle with radius AB and centre at A is

A. $x^2 + y^2 + 4x + 9 = 0$

B. $x^2 + y^2 + 4x - 9 = 0$

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

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

Answer: B

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201. If P_1, P_2 and P_3 are the perimeters of the three circleS

and

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

$4x^2 + 4y^2 - 4x - 12y - 186 = 0$

$x^2 + y^2 - 6x + 6y - 9 = 0$ respectively, then

A. $P_1 < P_2 < P_3$

B. $P_1 < P_3 < P_2$

C. $P_3 < P_2 < P_1$

D. $P_2 < P_3 < P_1$

Answer: B

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202. The number of circleS that touch all the three lines $x + y - 1 = 0, x - y - 1 = 0$ and $y + 1 = 0$ is

A. 2

B. 3

C. 4

D. 1

Answer: C

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203. Which of the following equations gives a circle

A. $r = 2\sin\theta$

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

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

D. $5 = r + \sqrt{2}\cos\theta$

Answer: A

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204. The equation of the circle described on the common chord of the circleS $x^2 + y^2 + 2x = 0$ and $x^2 + y^2 + 2y = 0$ as diameter is

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

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

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

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

Answer: C

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205. If $y = 3x$ is a tangent to a circle with centre (1,1) then the other tangent drawn through (0,0) to the circle is

A. $3y = x$

B. $y = -3x$

C. $y = 2x$

D. $y = -2x$

Answer: A

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206. If $x - y + 1 = 0$ meets the circle.

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

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. $x^2+y^2+3x-y+1=0$

Answer: A

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207. The ltngth of the tangtnt drawn to the circle $x^2+y^2-2x+4y-11=0$ from the point (1,3) is

A. 1

B. 2

C. 3

D. 4

Answer: C

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208. Observe the following statements I. The circle $x^2 + y^2 - 6x - 4y - 7 = 0$ touches y axis II. The circle $x^2 + y^2 + 6x + 4y - 7 = 0$ touches x -axis which of the following is a correct statement?

A. Both I and II are true

B. Neither I nor II is true

C. I is true, II is false

D. I is false, II is true

Answer: B

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209. The number of common tangents to the circles $x^2 + y^2 = 4$ and $x^2 + y^2 - 6x - 8y - 24 = 0$ is,

A. 1

B. 2

C. 3

D. 4

Answer: B

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210. The equation of the circle having its centre on the line x +2y - 3 = 0 and passing through the points of intersection of the circles $x^2 + y^2 - 2x - 4y + 1 = 0$ and $x^2 + y^2 - 4x - 2y + 4 = 0$ is :

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

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

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

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

Answer: C

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211. The circleS $x^2 + y^2 + 2ax + c^2 = 0$ and $x^2 + y^2 + 2by + c^2 = 0$ touch if

A. $\frac{1}{a} + \frac{1}{b} = \frac{1}{c}$

B. $\frac{1}{a^2} + \frac{1}{b^2} = \frac{1}{c}$

C. $\frac{1}{a^2} + \frac{1}{b^2} = \frac{1}{c^2}$

D. $\frac{1}{a^2} - \frac{1}{b^2} = \frac{1}{c}$

Answer: B

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212. To which of the following circleS, the line $y - x + 3 = 0$ is a normal at $\left(3 + \frac{3}{\sqrt{2}}, \frac{3}{\sqrt{2}}\right)$?

A. (x-3/(sqrt(2)))^2 + (y-(3)/(sqrt(2))^(2)=9`

B. (x-(3)/(sqrt(2)))^2 + (y-(3)/(sqrt(2)))^2 = 9

C. $x^2 + (y-3)^2 = 9$

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

Answer: D

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

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

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

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

D. 4(x^(2)+y^(2)-x-6 y) $+ 1 = 0$

Answer: A

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214. circle is drawn through the point (2,0) to cut intercept of length 5 units on the x -axis. If the centre lies in the first quadrant then its equation is

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

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

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

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

Answer: C

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215. The length of the chord of the circle $(x-3)^2 + (y-5)^2 = 80$ cut-off by the lines $3x - 4y - 9 = 0$ is

A. 16

B. 8

C. $\sqrt{96}$

D. $2\sqrt{96}$

Answer: A

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216. The tangent to the circle $x^2 + y^2 = 9$, which is parallel to y-axis and does not lie in the third quadrant, touches the circle at the point:

A. (3,0)

B. (-3,0)

C. (0,3)

D. (0,-3)

Answer: A

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217. If one end of diameter of the circle $2x^2 + 2y^2 - 4x - 8y + 2 = 0$ is (3,2) , then the other end

is :

A. (2,3)

B. (4,-2)

C. (-1,2)

D. (2,-1)

Answer: C

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218. The tangtnts to the circle $x^2 + y^2 = 169$ at the point (5,12) and (12,-5) are

A. parallel

B. at right angles

C. inclined at an ang lt of 45°

D. inclined at an ang lt of 60°

Answer: A

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219. The number of tangtnts from (1,2) to the circle $x^2 + y^2 - 2x - 4y + 4 = 0$ is

A. 1

B. 2

C. 0

D. none of these

Answer: B

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220. The equation of a circle which touches the y -axis and has its centre at (1,2) is

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

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

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

D.

Answer: A

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221. The circle passes through the point (1,2) and cuts the circle $x^2 + y^2 = 4$ orthogonally, then the equation of the locus of the centre is

A. $x^2 + y^2 - 3x - 8y + 1 = 0$

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

C. $2x + 4y - 9 = 0$

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

Answer: C

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222. The two circles $x^2 + y^2 - 2x - 3 = 0$ and $x^2 + y^2 - 4x - 6y - 8 = 0$ are such that :

A. -they touch each other

B. they interscet each other

C. one lies inside the other

D. each lies out side the other

Answer: B

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223. The centre of a circle is (3,-1) and it makes an intercept of 6 units on the line $2x - 5y + 18 = 0$. The equation of the circle is

A. $x^2 + y^2 - 6x + 2y - 28 = 0$

B. $x^2 + y^2 + 6x - 2y + 28 = 0$

C. $x^2 + y^2 + 4x - 2y + 24 = 0$

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

Answer: A

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224. If $3x + y = 0$ is a tangtnt to the circle which has its centre at the point $(2, -1)$, then the equation of the other tangtnt to the circle from the origin is

A. $x + 3y = 0$

B. $3x - y = 0$

C. $x - 3y = 0$

D. $x + 2y = 0$

Answer: C

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225. The equation of the smalltst circle passing through the points (2,2) and (3,3) is

A. $x^2 + y^2 - 5x - 5y + 12 = 0$

B. $x^2 + y^2 + 5x + 5y + 12 = 0$

C. $x^2 + y^2 - 5x + 5y - 12 = 0$

D. $x^2 + y^2 + 5x - 5y + 12 = 0$

Answer: A

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226. The point (5,-7) lines outside the circle

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

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

C. $x^2 + y^2 + 8x + 7y - 2 = 0$

D. $x^2 + y^2 - 5x + 7y - 1 = 0$

Answer: D

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227. If the circles $x^2 + y^2 = 9$ and $x^2 + y^2 + 2\alpha x + 2y + 1 = 0$ touch each other internally , then α=

A. 1

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

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

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

Answer: D

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228. The length of the diameter of the circle which cuts three circles

$x^2 + y^2 - xy - 14 = 0$

$x^2 + y^2 + 3x - 5y - 10 = 0$

$x^2 + y^2 - 2x + 3y - 27 = 0$ M

orthogonally, is

A. 4

B. 2

C. 8

D. 6

Answer: A

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229. The length of the chord joining the points $(4\cos\theta, 4\sin\theta)$ and $\left(4\cos\left(\theta+60^2\right), 4\sin(\theta+60^\circ)\right)$ of the circle $x^2+y^2=16$ is

A. 16

B. 2

C. 4

D. 8

Answer: C

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230. The number of common tangents to the circles $x^2 + y^2 - y = 0$ and $x^2 + y^2 + y = 0$ is

A. 0

B. 1

C. 2

D. 3

Answer: D

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231. Two circles centered at (2,3) and (5,6) intersect each other. If the radii are equal, the equation of the common chord is

A. $x - y - 8 = 0$

B. $x + y - 8 = 0$

C. $x - y + 1 = 0$

D. $x + y + 1 = 0$

Answer: B

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232. The points (1,0),(0,1),(0,0) and (2k,3k), k $\neq$ 0 are concyclic if k =

A. $\frac{5}{13}$

B. $-\frac{5}{13}$

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

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

Answer: A

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233. If a circle with the point (-1, 1) as the centre touches the line x + 2y + 9 = 0, then the co-ordinates of the point of

contact are:

A. (-3,3)

B. (-3,-3)

C. (0,0)

D. $\left(\frac{7}{3}, -\frac{17}{3}\right)$

Answer: B

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234. The Locus of the centre of the circle of radius 3, which rolls on the outside of the circle $x^2 + y^2 + 3x - 6y - 9 = 0$ is :

A. $x^2 + y^2 + 3x - 6y - 31 = 0$

B. $x^2 + y^2 + 3x - 6y - \frac{29}{4} = 0$

C. $x^2 + y^2 + 3x - 6y - 45 = 0$

D. $x^2 + y^2 + 3x - 6y + 31 = 0$

Answer: C

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235. if the square of the length of the tangents from point P to the circleS $x^2 + y^2 = a^2, x^2 + y^2 = b^2, x^2 + y^2 = c^2$ are in A.P. Then a^2, b^2, c^2 are is

A. (AP)

B. (GP)

C. (HP)

D. none of these

Answer: A

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236. The centre of the circle $x = 2 + 3\cos\theta y = 3\sin\theta - 1$ is ...

A. (-2,1)

B. (-1,2)

C. (3,3)

D. (2,-1)

Answer: D

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237. The centres of a set of circleS each of radius 3 lies on the circle $x^2 + y^2 = 25$. The locus of any point in the set is

A. $4 \leq x^2 + y^2 \leq 64$

B. $x^2 + y^2 \leq 25$

C. $x^2 + y^2 \geq 25$

D. $3 \leq x^2 + y^2 \leq 9$

Answer: A

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238. The equation of a circle with origin as centre and passing through the vertices of an equilateral triangle whose median is of length 3a 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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239. A circle touches the x - axis and also touches the circle with centre (0,3) and radius 2. The locus of the centre of the

circle is :

A. parabola

B. a hyperbola

C. a circle

D. an ellipse

Answer: A

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240. If the lines 3x - 4y - 7 = 0 and 2x - 3y - 5 = 0 are two diameters of a circle of area 49π square units, then the equation of the circle is:

A. $x^2 + y^2 + 2x - 2y - 62 = 0$

B. $x^2 + y^2 - 2x + 2y - 62 = 0$

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

D. $x^1 + y^2 + 2x - 2y - 47 = 0$

Answer: C

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241. Let 'C' be the circle with centre (0,0) and radius 3 units. The equation of the locus of the mid points of chords of the circle 'C' that subtend an angle of $2\pi / 3$ at its centre is:

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

B. $x^2 + y^2 = \frac{27}{4}$

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

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

Answer: C

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242. Consider a family of circles which are passing through the point (-1, 1) and are tangent to x-axis. If (h,k) are the co-ordinates of the centre of the circle, then the set of values of k is given by the interval :

A. $-\frac{1}{2} \leq k \leq \frac{1}{2}$

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

C. $0 < k < \frac{1}{2}$

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

Answer: D

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243. 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: A

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244. If P and Q are the points of intersection of the circles $x^2 + y^2 + 3x + 7y + 2p - 5 = 0$ and $x^2 + y^2 + 2x + 2y - p^2 = 0$, then there is a circle passing through P, Q and (1, 1) for :

A. exactly one value of p

B. all values of p

C. all except one value of p

D. all except two values of p

Answer: C

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245. Three distinct points A, B and C are given in the 2 - dimensional coordinate plane such that the ratio of the distances of any one of them from the point (1,0) to the distance from the point(-1,0) is equal to $\frac{1}{3}$. The circumcentre of the trianglt ABC is at the point

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

A. $15 < m < 65$

B. $35 < m < 85$

C. $-85 < m < -35$

D. $-35 < m < 15$

Answer: D

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247. The two circles : $x^2 + y^2 = ax$ and $x^2 + y^2 = c^2$ (c > 0) touch each other if :

A. $|n| = 2c$

B. `2|a|-c

C. |a|=c`

D. $a = 2c$

Answer: C

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248. The number of common tangents to the circles $x^2 + y^2 = 4$ and $x^2 + y^2 - 6x - 8y - 24 = 0$ is,

A. 0

B. 1

C. 3

D. 4

Answer: B

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249. The circleS $x^2 + y^2 - 10x + 16 = 0$ and $x^2 + y^2 = r^2$ intersect each other in distinct points, if

A. $r < 2$

B. $r > 8$

C. $2 < r < 8$

D. $2 \leq r \leq 8$

Answer: C

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250. Let AB be a chord of the circle $x^2 + y^2 = a^2$ subtending a right angle at the centre. Then the locus of the centroid of triangle PAB as P moves on the circle is:

A. a parabola

B. a circle

C. an ellipse

D. a pair of straight lines

Answer: B

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251. Let PQ and RS be tangents at the extremities of the diameter PR of a circle of radius r. If PS and RQ intersect at a point X on the circumference of the circle, then 2r equals:

A. $\sqrt{PQt \times RS}$

B. $\frac{PQ + RS}{2}$

C. $\frac{2PQ \times RS}{PQ + RS}$

D. $\frac{\sqrt{PQ^2 \times RS^2}}{2}$

Answer: A

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252. 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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253. The equation of the circle passing through the point (1, 1) and the point of intersection of: $x^2 + y^2 + 13x - 3y = 0$ and $2x^2 + 2y^2 + 4x - 7y - 25 = 0$ is :

A. $4x^2 + 4y^2 - 4x - 7y - 25 = 0$

B. $4x^2 + 4y^2 + 30x - 13y - 25 = 0$

C. $4x^2 + 4y^2 - 17x - 10y + 25 = 0$

D. none of these

Answer: B

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254. A square in inscribed in the circle $x^2 + y^2 - 2x + 4y - 3 = 0$. Its sides are paralltl to the coordinates axes. Then one of the vertex of the square is

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

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

C. $(1, -2+\sqrt{2})$

D. none of these

Answer: D

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255. The slope of the tangent at the point (h, h) of the circle $x^2 + y^2 = a^2$ is

A. 0

B. 1

C. -1

D. depends on h

Answer: C

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256. How many common tangents can be drawn to the following circles $x^2 + y^2 = 6$ and $x^2 + y^2 + 6x + 2y + 1 = 0$

A. 4

B. 3

C. 2

D. 1

Answer: A

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257. If $2x - 4y = 9$ and $6x - 12y + 7 = 0$ are common tangtnts to a circle, then radius of the circle is

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

B. $\frac{17}{6\sqrt{5}}$

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

D. $\frac{17}{3\sqrt{5}}$

Answer: B

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258. A variable chord of the circle $x^2 + y^2 - 2ax = 0$ is drawn through the origin. Then the locus of the centre of

the circle drawn on this chord as diameter is:

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

B. $x^2 + y^2 - a\dot{x} = 0$

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

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

Answer: B

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259. 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: B

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260. The length of the common chord of the circle

$x^2 + y^2 + 2x + 3y + 1 = 0$ and

$x^2 + y^2 + 4x + 3y + 2 = 0$ is

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

B. $2\sqrt{2}$

C. $3\sqrt{2}$

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

Answer: B

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261. For the given circleS $x^2 + y^2 - 6x - 2y + 1 = 0$ and $x^2 + y^2 + 2x - 8y + 13 = 0$ which of the following is true?

A. one circle lies inside the other

B. one circle lies complttely outside the other

C. two circleS intersect in two points

D. they touch each other externally

Answer: D

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262. If the line $y\cos\alpha = x\sin\alpha + a\cos\alpha$ be a tangtnt to the circle $x^2 + y^2 = a^2$ then

A. $\sin^2\alpha = 1$

B. $\cos^2\alpha = 1$

C. $\sin^2\alpha = a^2$

D. $\cos^2\alpha = a^2$

Answer: B

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263. The locus of the midpoint of a chord of the circle $x^2 + y^2 = 4$ which subtends a right angle at the origin is

A. $x + y = 2$

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

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

D. $x + y = 1$

Answer: C

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264. The equation of the circle which is touched by $y = x$ has its centre on the positive direction of the x -axis and

cuts off a chord of length 2 units along the line $\sqrt{3}y - x = 0$ is

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

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

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

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

Answer: A

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265. Tangtnts drawn from the point (4,3) to the circle $x^2 + y^2 - 2x - 4y = 0$ are inclined at an anglt

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

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

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

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

Answer: D

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266. If $\frac{x}{\alpha}+\frac{y}{\beta}=1$ touches the circle $x^2+y^2=a^2$ then point $\left(\frac{1}{\alpha},\frac{1}{\beta}\right)$ lies on

A. a straight line

B. a circle

C. a parabola

D. an ellipse

Answer: B

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267. If a point (α, β) lies on the circle $x^2 + y^2 = 1$, then the locus of the point, $(3\alpha + 2, \beta)$ is

A. a stright line

B. an ellipse

C. a parabola

D. none of these

Answer: B

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268. The equation of the tangent to the circle $x^2 + y^2$ + 4x - 4y + 4 = 0 which makes equal intercepts on the positive coordinate axes is:

A. $x + y = 2$

B. $x + y = 2\sqrt{2}$

C. $x + y = 4$

D. $x + y = 8$

Answer: B

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269. The equation of the circle described on the common chord of the circleS $x^2 + y^2 + 2x = 0$ and

$x^2 + y^2 + 2y = 0$ as diameter is

A. $x^2 + y^2 = 2ab(bx + ay).$

B. $x^2 \pm y^2 = bx + ay$

C. $\left(a^2 + b^2\right)\left(x^2 + y^2\right) = 2ab(bx - ay)$

D. $\left(a^2 + b^2\right)\left(x^2 + y^2\right) = 2(bx + ay)$

Answer: C

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270. 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_1)

D. (x_2, y_2)

Answer: B

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271. The locus of the centre of the circleS which touches both the axes is given by

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

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

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

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

Answer: A

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272. 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 centre at $\left(\frac{3}{2}, \frac{3}{2}\right)$ is

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