MATHS

BOOKS - DEEPTI MATHS (TELUGU ENGLISH)

SYSTEM OF CIRLES

Solved Examples

1. The radical axis of the circles $x^2+y^2+4x+8y+19=0, x^2+y^2+8x+4y+19=0$ is

A. x-y = 0

B. $5x-9y-5=0$

C. $3y+1=0$

D. x + 10y - 2 = 0

Answer: A

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2. The length of the common chord of the two circles $(x-3)^2+(y-5)^2=7^2, (x-5)^2+(y-3)^2=7^2$ is

A. $\sqrt{47}$

B. $2\sqrt{47}$

C. $3\sqrt{47}$

D. $4\sqrt{47}$

Answer: B

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3. The radical centre of the circles $x^2+y^2-2x+6y=0, x^2+y^2-4x-2y+6=0, x^2+y^2-12x+12y$

is

A. (3,1)

B. (3,0)

C. (1,3)

D. (0,3)

Answer: B

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4. If (0,-3) is one limiting point of a coaxal system of circles $x^2 + y^2 + 4y + 7 = 0$ is a member , then the other limiting point is

A. (-2,-2)

B. (2,1)

C. (6,5)

D. (5,3)

Answer: A

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5. If (2,-1) , (-3,2) are the limiting points of a coaxal system , then the equation of the circle in its conjugate system having minimum are is

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

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

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

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

Answer: B

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6. A(2,3) and B(-7, -12) are conjuigate point w.r.t $S=x^2+y^2-6x-8y-1=v$,. The angle between the circle S = 0 and the circle having AB as diameter is

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

B. 0

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

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

Answer: D

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7. The equation of the circle which passes through (2,0) and whose centre is the limit of the point of intersection of the lines 3x + 5y = 1 and $(2+c)x+5c^2y=1$ as c tends to 1 is

A. $25(x^2+y^2)-20x+2y-60=0$

B. $25(x^2+y^2)+20x-2y-60=0$

C. $25(x^2+y^2)-10x-2y-60=0$

D. $x^2+y^2-20x+2y-60=0$

Answer: A

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8. Circles with radii 3,4,5 are touching each other externally . If P is the point of intersection of tangents to these circles at their points of contact, the distance of P from the point of contact is

A. $\sqrt{2}$

B. $\sqrt{5}$

C. 4

D. $\sqrt{7}$

Answer: B

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Exercise 1

1. The angle at which the circles $x^2+y^2+8x-2y-9=0, x^2+y^2-2x+8y-7=0$ in tersect is

A. $\pi/6$

B. $\pi/4$

C. $\pi/3$

D. $\pi/2$

Answer: D

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2. The point (3,-4) lies on both the circles $x^2+y^2-2x+8y+13=0$ and $x^2+y^2-4x+6y+11=0$. Then the angle between the circles is :

A. 60°

B. $\tan^{-1}(1/2)$

C. $\tan^{-1}(3/5)$

D. 135°

Answer: D

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3. If the angle between the circlex $x^2+y^2-2x-4y+c=0$ and $x^2+y^2-4x-2y+4=0$ is 60°, then c is equal to

A. $\frac{3 \pm \sqrt{5}}{2}$

B. $\frac{6 \pm \sqrt{5}}{2}$

C. $\frac{9 \pm \sqrt{5}}{2}$

D. $\frac{7 \pm \sqrt{5}}{2}$

Answer: D

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4. If the circles $x^2 + y^2 - 6x - 8y + 12 = 0, x^2 + y^2 - 4x + 6y + k = 0$ cut orthogonally, then k =

A. -24

B. 24

C. 12

D. 15

Answer: A

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5. If $x^2 + y^2 - 2x + 3y + k = 0$ and $x^2 + y^2 + 8x - 6y = 7 = 0$ cut each other orthogonally , the value of k must be

A. -10

B. 1

C. 5

D. -2

Answer: A

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6. 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: A

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7. If the circle $x^2 + y^2 + 8x - 4y + c = 0$ touches the circle $x^2 + y^2 + 2x + 4y - 11 = 0$ externally and cuts the circle $x^2 + y^2 - 6x + 8y + k = 0$ orthogonally then k =

A. 59

B. -59

C. 19

D. -19

Answer: B

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8. If the circles $x^2 + y^2 - 2\lambda x - 2y - 7 = 0$ and $3(x^2 + y^2) - 8x + 29y = 0$ are orthogonal then $\lambda =$

A. 4

B. 3

C. 2

D. 1

Answer: D

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9. The circles $(x+a)^2+(y+b)^2=a^2, (x+\alpha)^2+(y+\beta)^2=\beta^2$ cut orthogonally if

A. $2(a\alpha+b\beta)=b^2+\alpha^2$

B. $a\alpha+b\beta=b^2+\alpha^2$

C. $2(a\alpha+b\beta)=b^2+\beta^2$

D. $a\alpha+b\beta=a^2+\beta^2$

Answer: A

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10. If the circles of same radius a and centres (2,3), (5,6) cut orthogonally , then a=

A. 1

B. 2

C. 3

D. 4

Answer: C

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11. If the circles of same radius a and centre (2, - 3), (-4, 5) cut orthogonally , then a =

A. $5\sqrt{2}$

B. $2\sqrt{5}$

C. $\sqrt{2}$

D. $\sqrt{5}$

Answer: A

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12. Find the equation of the circle which cuts orthogonally the circle $x^2 + y^2 - 4x + 2y - 7 = 0$ and having a center at (2,3).

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

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

C. $x^2 + y^2 + 6x - 4y + 19 = 0$

D. $3x^2 + 3y^2 + 2x + 12y - 2 = 0$

Answer: A

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13. If a circle passes through the point (a,b) and cuts the circle $x^2 + y^2 = 4$ 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: D

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14. The equation of the circle passing through (0,0) and cutting orthogonally the circles $x^2 + y^2 + 6x - 15 = 0, x^2 + y^2 - 8y + 10 = 0$ is

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

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

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

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

Answer: A

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15. The equation of the circle which passes the origin and cuts orthogonally each of the circles $x^2 + y^2 - 6x + 8 = 0$ and $x^2 + y^2 - 2x - 2y = 7$ is

A. $3x^2 + 3y^2 - 8x - 13y = 0$

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

C. $3x^2 + 3y^2 + 8x - 29 - y = 0$

D. $3x^2 + 3y^2 + 8x + 29y = 0$

Answer: B

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16. The equation of the circle cutting orthogonally the circles $x^2 + y^2 - 8x - 2y + 16 = 0, x^2 + y^2 - 4x - 4y - 1 = 0$ and passing through the point (1,1) is

A. $3x^2 + 3y^2 - 14x + 23y - 15 = 0$

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

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

D. $4x^2 + 4y^2 - 15x - 4 = 0$

Answer: A

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17. Find the equation of the circle which is orthogonal to each of the following three circles.

$x^2 + y^2 + 2x + 17y + 4 = 0$ ___ (1)

$x^2 + y^2 + 7x + 6y + 11 = 0(\_\_\_)(2)$

and $x^2 + y^2 - x + 22y + 3 = 0\_\_\_(3)$

A. $x^2 + y^2 - 6x - 4y - 44 = 0$

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

C. $x^2 + y^2 - 14x - 5y - 34 = 0$

D. $x^2 + y^2 - 5x - 14y - 34 = 0$

Answer: A

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18. The equation of the circle which cuts orthogonally the three circles

$x^2 + y^2 + 4x + 2y + 1 = 0, 2x^2 + 2y^2 + 8x + 6y - 3 = 0, x^2 + y^2 + 6x -$

is

A. $x^2 + y\&(2) - 6x - 4y - 44 = 0$

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

C. $x^2 + y^2 - 14x - 5y - 34 = 0$

D. $x^2 + y^2 - 5x - 14y - 34 = 0$

Answer: C

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19. A circle S cuts three circles $x^2 + y^2 - 4x - 2y + 4 = 0, x^2 + y^2 - 2x - 4y + 1 = 0$ and $x^2 + y^2 + 4$

orthogonally . Then the radius of S is

A. $\sqrt{\frac{29}{8}}$

B. $\sqrt{\frac{28}{11}}$

C. $\sqrt{\frac{29}{7}}$

D. $\sqrt{\frac{29}{5}}$

Answer: A

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20. The equation of the circle which cuts orthogonally the three circles $x^2 + y^2 = a^2$, $(x - g)^2 + y^2 = a^2$, $x^2 + (y - f)^2 = a^2$ is

A. $2x^2 + 2y^2 - gx - fy + 10a^2 = 0$

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

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

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

Answer: B

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21. The circles orthogonal to the three circles $x^2 + y^2 + a_i x + b_i y + c = 0$, $I = 1, 2, 3$ is

A. $x^2 + y^2 - b_i x - a_i y - c = 0$

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

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

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

Answer: B

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22. A circle passes through origin and has its centre on y = x . If it cuts $x^2 + y^2 - 4x - 6y + 10 = 0$ orthogonally then the equation of the circle 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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23. Find the equation of the circle passing through the origin, having its centre on the line x + y = 4 and intersecting the circle $x^2 + y^2 - 4x + 2y + 4 = 0$ orthogonlly.

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

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

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

D. none

Answer: B

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24. The circle with centre on the line $2x - 2y + 9 = 0$ and cutting the circle $x^2 + y^2 = 0$ orthogonal , passes through the fixed points

A. $(4, -4), (1/2, 1/2)$

B. $(-4, 4), (-1/2, 1/2)$

C. $(4, -4), (-1/2, 1/2)$

D. $(-4, 4), (1/2, 1/2)$

Answer: B

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25. The equation of the circle cutting orthogonally the circles $x^2 + y^2 - 4x + 2y - 11 = 0$, $x^2 + y^2 + 6x - 4y - 13 = 0$ and which has its centre on the line $2x + y + 4 = 0$ is

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

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

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

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

Answer: A

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26. The equation of the circle cutting orthogonally the circles $x^2 + y^2 + 2x + 8 = 0, x^2 + y^2 - 8x + 8 = 0$ and which touches the line $x - y + 4 = 0$ is

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

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

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

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

Answer: C

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27. The equation of the circle cutting orthogonally the circule $x^2 + y^2 - 4x + 3y - 1 = 0$ and passing through the point $(-2, 5), (0, 0)$ is

A. $2x^2 + 2y^2 - 11x - 16y = 0$

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

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

D. $4x^2 + 4y^2 - 15x - 4 = 0$

Answer: A

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28. The condition that the circles which passes through the points $(0, a), (0, -a)$ and touch the line $y = mx + c$ will cut orthogonally is

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

B. $c^2 = a^2(2 + m^2)$

C. $c^2 = a^2(3 + m^2)$

D. $c^2 = a^2(4 + m^2)$

Answer: B

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29. The locus of the centre of the circle which cuts the circles $x^2 + y^2 + 4x - 6y + 9 = 0$ and $x^2 + y^2 - 4x + 6y + 4 = 0$ orthogonally is

A. $8x + 12y - 5 = 0$

B. $8x - 12y + 5 = 0$

C. $4x - 6y + 5 = 0$

D. none

Answer: B

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30. The locus of the centre of the circle which cuts the circles $x^2 + y^2 + 4x - 6y + 9 = 0$ and $x^2 + y^2 - 5x + 4y + 2 = 0$ orthogonally is

A. $3x + 4y - 5 = 0$

B. $9x - 10y + 7 = 0$

C. $9x + 10y - 7 = 0$

D. $9x - 10y + 11 = 0$

Answer: B

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31. (1, 2) is a point on the circle $x^2 + y^2 + 2x - 6y + 5 = 0$ which is orthogonal to $x^2 + y^2 = 5$. The conjugate point of (1, 2) w.r.t the circle $x^2 + y^2 = 5$ and which lies on the first circle is

A. (7,-1)

B. (9,-2)

C. (-3,4)

D. (0,5)

Answer: C

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32. The point (3,1) is a point on a circle C with centre (2,3) and C is orthogonal to $x^2 + y^2 = 8$. The conjugate point of (3,1) w.r. to $x^2 + y^2 = 8$ which lies on C is

A. (5,1)

B. (5,4)

C. (1,5)

D. (0, + 2)

Answer: C

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33. The points A(2, 3) and B(-7, -12) are conjugate points w.r.t to the circle $x^2 + y^2 - 6x - 8y - 1 = 0$. The centre of the circle passing through A and B and orthogonal to given circle is

A. (-5,-9)

B. (-9,-15)

C. $(-5/2. \ -9/2)$

D. none

Answer: C

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34. The locus of centres of all circles which touch the line x = 2a and cut the circle $x^2 + y^2 = a^2$ orthogonally is

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

B. $y^2 + 4ax + 5a^2 = 0$

C. $y^2 = 4ax + 5a^2$

D. $y^2 = 4ax - 5a^2$

Answer: A

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35. If a circle passes through the point (a,b) and cuts the circle $x^2 + y^2 = k^2$ orthogonally, the equation of the locus of its centre is

A. $2ax + 2by = a^2 + b^2 + k^2$

B. $ax + by = a^2 + b^2 + k^2$

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

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

Answer: A

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36. 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. $8y - x + 1 = 0$

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

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

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

Answer: B

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37. The radical axis of the circles $x^2 + y^2 - 6x - 4y - 44 = 0$ and $x^2 + y^2 - 14x - 5y - 24 = 0$ is

A. $8x + y - 30 = 0$

B. $8x + y + 20 = 0$

C. $8X + 3Y - 20 = 0$

D. $8X + Y - 20 = 0$

Answer: D

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38. The equation of the radical axis of the pair of circles $7x^2 + 7y^2 - 7x + 14y + 18 = 0$ and $4x^2 + 4y^2 - 7x + 8y + 20 = 0$ is :

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

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

C. $21x - 68 = 0$

D. $23x - 68 = 0$

Answer: C

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39. 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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40. Let $C_1 \equiv x^2 + y^2 - 2x - 4y = 0$. $C_2 = x^2 + y^2 + 2x + 10y + 10 = 0$ and L

Then L is the

A. common chord of C_1 and C_2

B. common tangent of C_1 and C_2

C. radical axis of C_1 and C_2

D. none

Answer: C

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41. If the radical axis of two circles with centres A and B bisects AB then their radii are in the ratio

A. $1:1$

B. $1:2$

C. $2:3$

D. cannot be determined

Answer: A

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42. The centres of the circles are (a,c) and (b,c) and their radical axis is the y-axis . The radical of one of the circle is r . The radius of the other circle is

A. $r^2 - a^2 + b^2$

B. $2(r^2 - a^2 + b^2)$

C. $\sqrt{r^2 - a^2 + b^2}$

D. $2\sqrt{2} - a^2 + b^2)$

Answer: C

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43. B and C are two points on the circle $x^2 + y^2 = a^2$ point A (b,c) lies on that circle such that AB = AC = d, then the equation of the line $\leftrightarrow (BC)$ is

A. $bx + ay = a^2 - d^2$

B. $bx + ay = d^2 - a^2$

C. $bx + cy = 2a^2 - d^2$

D. $2(bx + cy) = 2a^2 - a^2$

Answer: D

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44. A line l meets the circle $x^2 + y^2 = 61$ in A , B and P(-5,6) is such that PA = PB = 10 . Then the quation 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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45. The circles $x^2+y^2=1, x^2+y^2+6x-2y=1$ and $x^2+y^2-12x+4y=1$ are such that

A. the centres are colinear

B. they are coaxial

C. they are concentric

D. none

Answer: B

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46. 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. exactly one value of a

B. no value of a

C. infinitely many values of a

D. exactly two values of a

Answer: B

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47. If aa circle passes through the point (a,b) and cuts the cirlce $x^2y^2 = p^2$ orthogonally , - then the equation of the locus of its centre is

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

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

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

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

Answer: D

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48. The locus of the centre of the circle, which cuts the circle $x^2 + y^2 - 20x + 4 = 0$ orthogonally and touchs the line x = 2 , is

A. $y^2 = 4x$

B. $y^2 = 16x$

C. $x^2 = 4y$

D. $x^2 = 16y$

Answer: B

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49. A circle passes through the points (3,4) and cuts the circle $x^2 + y^2 = a^2$ orthogonally, the locus of its centre is a straight line . If the distance of this straight line from the origin is 25 , then $a^2 =$

A. 250

B. 225

C. 100

D. 25

Answer: B

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50. The equation of the common tangent at the point contact of the circles

$x^2 + y^2 - 10x + 2y + 10 = 0, x^2 + y^2 - 4x - 6y + 12 = 0$ is

A. $5x + 12y + 19 = 0$

B. $4x - 7y - 13 = 0$

C. $3x - 4y + 1 = 0$

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

Answer: C

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51. The equation of the common chord of the two circles $x^2 + y^2 + 2x + 3y + 1 = 0, x^2 + y^2 + 4x + 3y + 2 = 0$ is

A. 2x + 1 = 0

B. 3x + 2 = 0

C. 5x + 10 = 0

D. 12x + 11 = 0

Answer: A

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52. The equation of the common chord of the two circles $(x-a)^2 + (y-b)^2 = c^2, (x-b)^2 + (y-a)^2 = c^2$ is

A. ax - by = 10

B. ax - by = 0

C. x - y = 0

D. ax + by = 1

Answer: C

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53. The distance from (1,2) to the radical axis of the circles

$x^2 + y^2 + 6x - 16 = 0, x^2 + y^2 - 2x - 6y - 6 = 0$ is

A. 1

B. 2

C. $\sqrt{5}$

D. $\sqrt{2}$

Answer: A

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54. The distanc of the point (1,-2) from the common chord of the circles

$x^2 + y^2 - 5x + 4y - 2 = 0$ and $x^2 + y^2 - 2x + 8y + 3 = 0$

A. 0

B. 1

C. 2

D. 3

Answer: A

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55. The distance of the point (1,-2) from the common chord of the circles

$x^2 + y^2 - 5x + 4y - 2 = 0$ and $x^2 + y^2 - 2x + 8y + 3 = 0$

A. 0

B. 1

C. $\sqrt{2}$

D. $\sqrt{3}$

Answer: A

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56. The length of the common chord of the circles of radii 15 and 20, whose centres are 25 unit of distance apart, is

A. 12

B. 16

C. 24

D. 25

Answer: C

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57. The length of the common chord of the circles

$x^2 + y^2 + 2x + 3y + 1 = 0, x^2 + y^2 + 4x + 3y + 2 = 0$ is

A. 2

B. $2\sqrt{2}$

C. $\sqrt{2}$

D. -2

Answer: B

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58. The length of the common chord of the two circles

$x^2 + y^2 - 4y = 0$ and $x^2 + y^2 - 8x - 4y - 11 = 0$ is

A. $\frac{\sqrt{11}}{2}$

B. $\sqrt{135}$

C. $\frac{\sqrt{135}}{4}$

D. $\frac{\sqrt{145}}{4}$

Answer: C

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59. The length of the common chord of the circles $x^2 + y^2 + 2hx = 0, x^2 + y^2 - 2ky = 0$ is

A. $\frac{hk}{h^2 + k^2}$

B. $\frac{hk}{\sqrt{h^2 + k^2}}$

C. $\frac{2hk}{h^2 + k^2}$

D. $\frac{2hk}{\sqrt{h^2 + k^2}}$

Answer: D

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60. The equation of the common chord of the two circles

$(x-a)^2+(y-b)^2=c^2, (x-b)^2+(y-a)^2=c^2$ is

A. $\dfrac{ab}{\sqrt{a^2+b^2}}$

B. $\dfrac{2ab}{\sqrt{a^2+b^2}}$

C. $\dfrac{a+b}{\sqrt{a^2+b^2}}$

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

Answer: B

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61. The length of the common chord of the circles

$(x-a)^2+(y-b)^2=c^2$ and $(x-b)^2+(y-a)^2=c^2=c^2$ is

A. $\sqrt{4c^2-2(a-b)^2}$

B. $\sqrt{4c^2-(a-b)^2}$

C. $\sqrt{2c^2-(a-b)^2}$

D. $\sqrt{c^2 - (a-b)^2}$

Answer: A

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62. The length of the common chord of the circles

$x^2 + y^2 + 2gx + c = 0$ and $x^2 + y^2 + 2fy - c = 0$ is

A. $\left[\frac{(g^2 - c)(f^2 + c)}{g^2 + f^2}\right]^{1/2}$

B. $\left[\frac{(g^2 + c)(f^2 - c)}{g^2 + f^2}\right]^{1/2}$

C. $2\left[\frac{(g^2 - c)(f^2 + c)}{g^2 + f^2}\right]^{1/2}$

D. $2\left[\frac{(g^2 + c)(f^2 - c)}{g^2 + f^2}\right]^{1/2}$

Answer: C

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63. The length of the common chord of the circle

$x^2 + y^2 + ax + by + c = 0$ and $x^2y^2 + bx + ay + c = 0$ is

A. $\frac{\sqrt{(a+b)^2 - 8c}}{2}$

B. $\frac{\sqrt{(a-b)^2 - 8c}}{2}$

C. $\frac{\sqrt{(a-b)^2 + 8c}}{2}$

D. $\frac{\sqrt{(a+b)^2 + 8c}}{2}$

Answer: A

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64. The length of the common chord of the circles

$x^2 + y^2 + 2hx + a^2 = 0, x^2 + y^2 - 2ky - a^2 = 0$ is

A. $2\frac{\sqrt{(k^2 + a^2)(h^2 - a^2)}}{h^2 + k^2}$

B. $\frac{\sqrt{(k^2 + a^2)(h^2 - a^2)}}{h^2 + k^2}$

C. $2\frac{\sqrt{(k^2+a^2)(h^2+a^2)}}{h^2-k^2}$

D. $2\frac{\sqrt{(2k^2+y^2)(h^2-x^2)}}{2h^2+3k^2}$

Answer: A

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65. The length of the common chord of the circles of radii 15 and 20 whose centres are 25 units apart is

A. 24

B. 25

C. 15

D. 20

Answer: A

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66. If the circle $x^2+y^2+2gx+2fy+c=0$ bisects the circumference of the circle

$x^2+y^2+2g'x+2f'y+c'=0$, them the length of the common chord of these two circles is

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

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

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

D. $2\sqrt{g'^2+f'^2+c'}$

Answer: B

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

A. $\pi/6$

B. $\pi/4$

C. $\pi/3$

D. $\pi/2$

Answer: D

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68. If one of the diameter of the circle , given by the equation ,

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

is a chord of a circle S , where centre is at (-3,2) , then the radius of S is

A. $5\sqrt{2}$

B. $5\sqrt{3}$

C. 5

D. 10

Answer: B

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69. The lengthk of the equation chord of the two circles $(X-a)^2+y^2=a^2$ and $x^2+(y-b)^2=b^2$ is

A. $\left(a^2+b^2\right)\left(x^2+y^2\right)+2ab(bx-ay)\equiv 0$

B. $\left(a^2+b^2\right)\left(x^2+y^2\right)-2ab(bx-ay)=0$

C. $\left(a^2+b^2\right)\left(x^2+y^2+ab(bx-ay)=0\right.$

D. $\left(a^2+b^2\right)\left(x^2+y^2\right)-2ab(bx-ay)=0$

Answer: B

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70. The equation of the circle described on the common chord of the circles $x^2+y^2+2x=0, x^2+y^2+2y=0$ as diameter is

A. $x^2+y^2+2x=0, x^2+y^2+2y=0$ as diameter is

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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71. The equation of the circle whose diamter is the common chord of the circles

$x^2+y^2+2x+3y+2=0 \text{ and} x^2+y^2+2x-3y-4=0$ 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. $x^2+y^2+2x-2y+1=0$

Answer: C

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

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

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

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

Answer: B

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73. The circle on the chord $x\cos\alpha + y\sin\alpha = p$ of the circle $x^2 + y^{20 = r^2}$ as diameter is

A. $x^2 + y^2 - r^2 - 2p(x\cos\alpha + y\sin\alpha - p) = 0$

B. $x^2 + y^2 - r^2 + 2p(x\cos\alpha + y\sin\alpha - p) = 0$

C. $x^2 + y^2 - r^2 = p(x\cos\alpha + y\sin\alpha - p) = 0$

D. $x^2 + y^2 - r^2 + p(x\cos\alpha + \sin\alpha - p) = 0$

Answer: A

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74. The intercet on the line y = x by the circle $x^2 + y^2 - 2x = 0$ is AB .

Equation of the circle on AB as a diameter is

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

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

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

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

Answer: A

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75. 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. $2(x^2+y^2)+3x-y+1=0$

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

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

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

Answer: A

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76. If the chord of contact of tangents from a point to a given circle passes through Q , then the circle on PQ as diameter

A. cuts the given circle orthogonally

B. touches the given circle externally

C. touches the given circle internally

D. none

Answer: A

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77. The equation of the circle passing through the origin and the point of intersection of the two circles $x^2 + y^2 - 4x - 6y - 3 = 0, x^2 + y^2 + 4x - 2y - 4 = 0$ is

A. $x^2 + y^2 - 28x - 18y = 0$

B. $x^2 + y^2 + 28x - 18y = 0$

C. $x^2 + y^2 + 28x + 18y = 0$

D. $x^2 + y^2 - 28x + 18y = 0$

Answer: A

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78. The length of the common chord of the circles

$x^2 + y^2 + 2x + 3y + 1 = 0, x^2 + y^2 + 4x + 3y + 2 = 0$ is

A. $9x^2 + 9y^2 + 16y - 34 = 0$

B. $10(x^2 + y^2) + 3y - 86 = 0$

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

D. $x^2 + y^2 + 22 + 3y + 11 = 0$

Answer: D

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79. Find the equation of the circle passing therough the points of intersection of the circles.

$x^2 + y^2 - 8x - 6y + 21 = 0$__(1)

$x^2 + y^2 - 2x - 15 = 0$___(2)

and (1, 2).

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

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

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

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

Answer: C

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80. The equation of the circle passing through the point of intersection of the circles

$x^2 + y^2 = 5, x^2 + y^2 + 12x + 8y - 33 = 0$ and touching x-axis is

A. $x^2 + y^2 - 6x - 4y + 9 = 0, 9x^2 + 9y^2 - 30x - 20y + 25 = 0$

B. $3x^2 + 3y^2 - 16x - 40y + 29 = 0, 9x^2 - 30x - 20 + 25 = 0$

C. $x^2 + y^2 - 6x - 4y - 9 = 0, 9x^2 + 9y^2 - 30x - 20y - 25 = 0$

D. $x^2 + y^2 - 6x - 4y + 9 = 0, x^2 + y^2 - 10x + 50y - 25 = 0$

Answer: A

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81. The equation of the circle passing through the point of intersection of the circles

$x^2 + y^2 - 3x - 6y + 8 = 0, x^2 + y^2 - 2x - 4y + 4$ and touching the line x + 2y = 5 is

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

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

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

D. none

Answer: A

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82. The equation of the circle passing through the points of intersection of the circles

$x^2 + y^2 - 3x - 6y + 8 = 0, x^2 + y^2 - 2x - 4y + 4 = 0$ and touching the line 2x+ y = 3 is

A. $x^2 + y^2 + 2x - 4 = 0, 15x^2 + 15y^2 + 10x + 20y - 48 = 0$

B. $x^2 + y^2 - 4x - 8y + 12 = 0, 5x^2 + 5y^2 + 4x + 8y - 36 = 0$

C. $x^2 + y^2 - 6x - 4y - 9 = 0, 9x^2 + 9x^2 - 30x - 20y - 25 = 0$

D. $x^2 + y^2 - 6x - 4y + 9 = 0, x^2 + y^2 - 10x + 50y - 25 = 0$

Answer: A

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83. The equation of the circle passing through the point of intersection of the circles

$x^2 + y^2 + 6x + 4y - 12 = 0, x^2 + y^2 - 4x - 6y - 12 = 0$ and having radius $\sqrt{13}$ is

A. $9x^2 + 9y^2 + 16y - 34 = 0$

B. $10(x^2 + y^2) + 3y086 = 0$

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

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

Answer: C

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84. The equation of the circle passing through (2a,0) and whose radical axis w.r. to the circle $x^2 + y^2 = a^2$ is $x = a/2$ is

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

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

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

D. none

Answer: C

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85. Equation of the circle passing through (2,0) and whose radical axis w.r. to the circle

$x^2+y^2=1$ is x = 1/2 is

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

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

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

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

Answer: A

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86. $(-2, 3)$ is the middle point of chord AB of the circle $x^2+y^2=81$.

The equation the circle through the point A, B and (0,1) is

A. $x^2 + y^2 - 16x + 24y - 23 = 0$

B. $x^2 + y^2 + 16x - 24y + 23 = 0$

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

D. none

Answer: B

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87. The equation of the circle passing through the intersection of the circles $x^2 + y^2 = 2ax$ and $x^2 + y^2 = 2by$ and having its centre on the line x/a- y/b = 2 is

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

B. x^(2) +y^(2) + 3ax - by = 0 `

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

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

Answer: A

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88. If tangents be drawn to the circle $x^2 + y^2 = 12$ at its point of intersection with the circle

$x^2 + y^2 - 2x - 3y = 0$, the coordinates of their point intersection is

A. (3,2)

B. (-2,3)

C. (2,3)

D. (2,-3)

Answer: C

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89. The equation of the circle cutting the circle $x^2 + y^2 + 2x - 4y + 8 = 0$ orthogonally and coaxal with circles $x^2 + y^2 + 6x + 4y - 12 = 0, x^2 + y^2 - 4x - 6y - 12 = 0$

A. $x^2 + y^2 - 8x + 6y - 12 = 0$

B. $x^2 + y^2 + 8x - 6y - 12 = 0$

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

D. $x^2 + y^2 - 8x - 6y - 12 = 0$

Answer: A

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90. The condition that the circle $x^2 + y^2 + 2gx + 2fy + c = 0$ to bisect the circumference of the circle $x^2 + y^2 + 2g^1x + 2f^1y + c^1 = 0$ is

A. $2g(g - g') + 2f(f - f') = c - c'$

B. $2g'(g-g')+2f'(f-f')=c-c'$

C. $g(g-g')+f(f-f')=c-c'$

D. g' (g-g') + f' (f-f') = c - c'

Answer: B

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91. If the circle $x^2+y^2+4x-22y+c=0$ bisects the circumference of the circle

$x^2+y^2-2x+8y-d=0$, then c + d =

A. 60

B. 50

C. 40

D. 56

Answer: B

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92. If the circle $x^2 + y^2 + 4x - 6y - c = 0$ bissects the circumference of the circle $x^2 + y^2 - 6x + 4y - 12 = 0$, then c =

A. 16

B. 24

C. 42

D. 62

Answer: D

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93. The equation of the circle which bisects the circumferences of the circles

$x^2 +^2 \ = 1, x^2 + y^2 + 2x = 3, x^2y^2 + 2y = 3$ is

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

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

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

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

Answer: A

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94. The equation of the circle passing through the point (1,2) cutting the circle

$x^2+y^2-2x+8y+7=0$ rthogonally and bisecting the circumference of the circle $x^2+y^2=9$ is

A. $5(x^2+y^2)-11x+11y-17=0$

B. $3(x^2+y^2)+10x+y-27=0$

C. $2(x^2+y^2)+5x+6y-17=0$

D. $(x^2+y^2-11x-y-27=0$

Answer: B

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95. If the circle $S \equiv x^2 + y^2 - 16 = 0$ intersects another circle S' = 0 f radius 5 in such a manner that the common chord is f maximum length and has a slope equal to 3/4 then the centre of S' = 0 is

A. (9/5,-12/5) r (-9/5,125)

B. (9/5,12/5) or (-9/5) or (-9/5, - 12/5)

C. (9/7, - 12/7) or (-9/7, 12/7)`

D. `(9/7, 12/7) or (-9/7, -12/7)

Answer: A

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96. x = 1 is the radical axis of two rthognally intersecting circles . If $x^2+y^2=4$ is one of the circles then the other circle

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

Answer: B

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97. Two circles S and S' intersect at P and Q . A, C lie on S and B , D lie n S' such that APB is parallel to CQD . Then

A. ABCD is cyclic quadriateral

B. AC is parallel to BD

C. ABCD is a rectangle

D. $\angle ACQ = 90^\circ$

Answer: B

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98. The circles $x^2 + y^2 = 4$ cuts the circle $x^2 + y^2 - 2x - 4 = 0$ at the point A and B . If the circle $x^2 + y^2 - 4xk = 0$ passes through A and B then the value of k is ?

A. -4

B. 0

C. -8

D. 4

Answer: D

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99. The radical centre of the circles $x^2+y^2=1, x^2+y^2-2x=1, x^2+y^2-2y=1$ is

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100. The radical centre of the circles $x^2+y^2+1=0, x^2+y^2-2x-3=0$ and $x^2+y^2-2y-3=0$ is

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101. The radical centre of the circles

$x^2+y^2-x+3y-3=0, x^2+y^2-2x+2y+2=0, x^2+y^2+2x+3y$

is

A. (2,3)

B. (2,-3)

C. (-2,3)

D. (-2,-3)

Answer: A

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102. The radical centre of the circles $x^2+y^2+a_rx+b_ry+c-0, r-1, 2, 3$ is (a,b)

A. (a,b)

B. (b.a)

C. (0,0)

D. none

Answer: C

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103. If the lengths of tangents drawn to the circles

$x^2+y^2-8x+40=0, 5x^2+5y^2-25x+80=0, x^2+y^2-8x+16y+$

from the point P are equal, then P =

A. $\left(8, \frac{15}{2}\right)$

B. $\left(-8, \frac{15}{2}\right)$

C. $\left(8, \frac{-15}{2}\right)$

D. $\left(-8, \frac{-15}{2}\right)$

Answer: C

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104. The radical centre of the three circles described on the three sides of a triangle as diameter is .... of the triangle

A. the orthocentre

B. the circumcentre

C. the incentre

D. the centroid of the triangle

Answer: A

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105. If A, B, C are the centres of three circles touching mutually externally then the radical centre of the circles for $\triangle$ ABC is

A. the orthocentre

B. the circumcentre

C. the incentre

D. centroid of Δ ABC

Answer: C

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106. 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. all except one value of p

B. all except two values of p

C. exactly one value of p

D. all values of p

Answer: A

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107. (a,0) and (b, 0) are centres of two circles belonging to a co-axial system of which y-axis is the radical axis. If radius of one of the circles 'r', then the radius of the other circle is

A. $(r^2 + b^2 + a^2)^{1/2}$

B. $(r^2 + b^2 - a^2)^{1/2}$

C. $(r^2 + b^2 - a^2)^{1/3}$

D. $\left(r^2+b^2+a^2\right)^{1/3}$

Answer: B

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108. The limiting points of the coaxal system $x^2+y^2+2\lambda x+4=0$ are

A. $(\pm 2, 0)$

B. $(0, \pm 3)$

C. $(0, 2)$

D. (1,3)

Answer: A

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109. The limiting points of the coaxal system $x^2+y^2+2\mu y+9=0$ are

A. $(\pm 2, 0)$

B. $(0, \pm 3)$

C. $(0, 2)$

D. (1,3)

Answer: B

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110. The equation to the coaxal system having the limiting points $(0, \pm 5)$ is

A. $x^2 + y^2 + 2\lambda x + 9 = 0$

B. $x^2 + y^2 + 2\mu y + 25 = 0$

C. $x^2 + y^2 + 2\lambda x + a^2 = 0$

D. $3x^2 + 3y^2 + 2\lambda x + 16 = 0$

Answer: B

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111. The equation to the coaxal system having the limiting $(\pm a, 0)$ is

A. $x^2 + y^2 + 2\lambda x + 9 = 0$

B. $x^2 + y^2 + 2\mu y + 25 = 0$

C. $x^2 + y^2 + 2\lambda x + a^2 = 0$

D. $3x^2 + 2y^2 + 2\lambda x + 16 = 0$

Answer: C

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112. The system of circles is $x^2 + y^2 + 2\lambda x - 5 = 0$ is

A. intersecting

B. nonintersecting

C. touching

D. none

Answer: A

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113. The system of circle $x^2 + y^2 - 2\mu y = 0$ is

A. intersecting

B. nonintersecting

C. touching

D. none

Answer: C

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114. The condition for the coaxial system $x^2 + y^2 + 2\lambda x + c = 0$, where λ is parameter and c is a constant , to have distinct limiting points is

A. c= 0

B. $c < 0$

C. c = - 1

D. $c > 0$

Answer: D

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115. The equation to the line joining the centres of the circles belonging to the coaxial system of circles

$4x^2 + 4y^2 - 12x + 6y - 3 + \lambda(x + 2y - 6) = 0$ is

A. $8x - 4y - 15 = 0$

B. $8x - 4y + 15 = 0$

C. $3x - 4y - 5 = 0$

D. $3x - 4y + 5 = 0$

Answer: A

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116. The limiting points of the coaxal system

$x^2 + y^2 + 11x - 5y - 2 + \lambda(x - y - 1) = 0$ is

A. (-2,-1),(0,-3)

B. (21),(-5.-6)

C. (21),(03)

D. (5.2)(5.6)

Answer: A

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117. The limiting point of the coaxal system

$x^2 + y^2 + 5x + y + 4 + \lambda(x^2 + y^2 + 10x - 4y - 1) = 0$ are

A. (-2,-1),(0,-3)

B. (1,2),(3,1)

C. (1,5), (5,3)

D. (-7,-9),(3,-1)

Answer: A

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118. The limiting points of the coaxal system determined by the circles

$x^2 + y^2 + 2x + 4y + 7 = 0, x + y^2 + 4x + 2y + 5 = 0$ are

A. (2,1) ,(0,3)

B. (-2,1),(0,3)

C. (-2,-1),(0,-3)

D. (2,-1),(0,3)

Answer: C

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119. The limiting points of the co-axal system containing the two circles

$x^2 + y^2 + 2x - 2y + 2 = 0$ and $25(x^2 + y^2) = 10x - 80y + 65 = 0$

are

A. (-1,1) (-5,-40)

B. (1,-1),(-1/5,- 8/5)

C. (-1,1),(1/5,8/5)

D. (-1,1),(-1/5, - 8/5)

Answer: C

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120. One limiting point of the coaxal system of circles containing

$x^2 + y^2 - \quad - 6x - 6y + 4 = 0$ and $x^2 + y^2 - 2x - 4y + 3 = 0$ is

A. (-1,1)

B. (-1,2)

C. (-2,1)

D. (-2,2)

Answer: A

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121. If (2,1) is limiting point of the coaxa system of which

$x^2 + y^2 - 6x - 4y - 3 = 0$ is a member, then the other limiting point is

A. (-5,-6)

B. (5,6)

C. (3,5)

D. (-8,-13)

Answer: A

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122. Origin is a limiting point of a coaxal system of which $x^2+y^2-6x-8y+1=0$ is a member . The other limiting point is

A. (-2,-4)

B. (3/25,4/25)

C. (-3/35,-4/25)

D. (4/25,3/25)

Answer: B

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123. The radical axis of the coaxal system of circles with limiting points $(1, 2)$ and $(4, 3)$ is given by the equation

A. $3x - y + 10 = 0$

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

C. $3x + y + 10 = 0$

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

Answer: B

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124. If (0,0) is one limiting point of a coaxal system of circles whose common radical aixs is the line x + y = 1 then the other limiting point is

A. (1,1)

B. (-1,-1)

C. (1,-1)

D. (-1,1)

Answer: A

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125. If (2,3)is one limiting point of a coaxal system of circles whose common radical axis is the line $x + y = 1$ then the other limiting point is

A. (-3,-2)

B. (3,-4)

C. (0,3)

D. (0,-2)

Answer: C

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126. If (3,2) is one limiting point of a coaxal system of circles whose common radical axis is $4x + 2y = 11$, then the other limiting point is

A. (1,1)

B. (2,2)

C. (2,1)

D. (3,2)

Answer: A

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127. If (1,2) is a limiting point of the coaxal system of circles containing the circle

$x^2 + y^2 + x - 5y + 9 = 0$ then the equation of the radical axes is

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

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

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

D. $3x - y - 1 = 0$

Answer: B

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128. Two circles $x^2 + y^2 - 2x + 6y + 6 = 0$ and $x^2 + y^2 - 5x + 6y + 15 = 0$ touch each other A limiting point of the co-axal system determined by them is

A. (3/2,-3)

B. (-3,-3)

C. (2,-3)

D. (3,-3)

Answer: D

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129. If $x^2+y^2-4x-2y+5=0$ and $x^2+y^2-6x-4y-3=0$ are members of a coaxal system of circles then centre of a point circle in the system is

A. (-5,-6)

B. (5,6)

C. (3,5)

D. (-8,-13)

Answer: A

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130. The coaxal system having limiting points (2,3), - (-3,2) is

A. $x^2+y^2-4x- \quad -6y+13+\lambda(5x+y)=0$

B. $x^2 + y^2 - 14x - 18y + 23 + \lambda(14x + y) = 0$

C. $x^2 + y^2 - 4x - 6y - 13 + \lambda(5x - y) = 0$

D. $2x^2 + 2y^2 + 4x + 6y + 13 + 10\lambda(5x - 6y) = 0$

Answer: A

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131. A circle of the coaxal system with limiting points (0,0) and (1,0) is

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

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

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

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

Answer: B

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132. The equation of the circle belonging to the coaxal system of which (1,2)(4,3) ae the limiting points and passing through the origin is

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

B. $9x^2 + 9y^2 - 14x - 30y + 16 = 0$

C. $9x^2 + 9y^2 - 52x + 46y + 105 = 0$

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

Answer: A

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133. The equation of the circle belonging to the coaxal system of which (2,-3),(0,-4) are the limiting points and passing through the point (2,-1) is

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

B. $9x^2 + 9y^2 - 14x - 30y + 16 = 0$

C. $9x^2 + 9y^2 - 52x + 46y + 105 = 0$

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

Answer: C

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134. If (1,-2) is a limiting point of a coaxal system of which the circle $x^2 + y^2 - x - 2y - 1 = 0$ is a member , then the equation of a circle of the system passing through origin is

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

B. $16x^2 + 16y^2 - 17x - 16y = 0$

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

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

Answer: A

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135. The equation of the circle touching the line $3x - 4y - 15 = 0$ and belonging to the coaxal system having limiting points (2,0) , (-2,0) is

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

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

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

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

Answer: D

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136. The equation of the circle having a radius 2 and passing through the limiting points of the coaxal system

$x^2 + y^2 - 6 - 2\lambda(x + y - 4) = 0$ is

A. $x^2 + y^2 + (-4 \pm 2\sqrt{3})x + (-4 \pm 2\sqrt{3})y + 6 = 0$

B. $x^2 + y^2 + (-4 + 2\sqrt{5})x + (13 + 2\sqrt{5})y + 6 = 0$

C. $3x^2 + 3y^2 + (-14 \pm 32\sqrt{3})x + (-11 \pm 2\sqrt{5})y + 6 = 0$

D. $3x^2 + 23y^2 + (40 + 3\sqrt{5})5c = (34 + 3\sqrt{5})2y + 26 = 0$

Answer: A

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137. The equation of the circle belonging to the coaxal system having limiting points $(0, -3), (-2, -1)$ and orthogonal to the circle $x^2 + y^2 + 2x + 6y + 1 = 0$ is

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

B. $x^2 + y^2 + 8x + 2y + 1 = 0$

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

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

Answer: C

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138. P (-2,-1) and (0,-3) are the limiting points of a coaxial system of which $C \equiv x^2 + y^2 + 5x + y + 4 = 0$ is a member. The circle $S \equiv x^2 + y^2 - 4x - 2y - 15 = 0$ is orthogonal to the circle C . The point where the polar of P cuts the circle S is

A. (3,6)

B. (-3,6)

C. (-6,3)

D. (6,3)

Answer: D

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139. The conjugate system of the coaxal system $x^2 + y^2 + 2ax + 2by + 2\lambda(ax - by) = 0$, λ is a paramter , is

A. $x^2 + y^2 + \mu(x / a + y / b + 2) =$

B. $x^2 + y^2 + (2a - 2a\lambda)x + (2b + 2b\lambda)y = 0$

C. $x^2 + y^2 + (2a - 2a\lambda)x + (2b - 2b\lambda) = y = 0$

D. $x^2 + y^2 + (2a + 2a\lambda)x + (2b + 2b\lambda)y = 0$

Answer: A

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140. The coaxal system which is orthogonal to the coaxal system

$x^2 + y^2 + 2x - 3y - 1 + \lambda(x - 4y + 1) = 0$, λ is parameter is

A. $5x^2 + 5y^2 - 14x - 6y + \mu(8x + 2y + 5) = 0$

B. $15x^2 + 15y^2 - 44x - 56y + \mu(18x + 22y + 15) = 0$

C. $5x^2 + 5y^2 - 14x - 6y - \mu(8x - 2y - 5) = 0$

D. $15x^2 + 35y^2 - \; - 44x - 56y - \mu(8x + 2y + 5) = 0$

Answer: A

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141. The system of circle orthogonal to $x^2 + y^2 + 2gx + 10 = 0$is

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

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

C. $x^2 + y^2 + 2gx + 2fy + 10 = 0$

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

Answer: D

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142. If (-2,-1) is a limiting point of a coaxal system of which

$x^2 + y^2 + 2x + 4y + 7 = 0$

is a member, then the equation of the or the gonal system is

A. $(x^2 + y^2 + x + 3y) + \lambda(2x + 3y + 3) = 0$

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

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

D. $3\left(x^2+y^2+2x+3y\right)+3\lambda(2x+3y+63)=0$

Answer: B

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143. If the origin is the limiting point of a system of coaxal of which $x^2+y^2+2gx+2gy+c=0$ is a member, then the equation of the circle of the orthogonal system is

A. $\left(x^2+y^2\right)(g+\lambda f)+4c(3x+\lambda y)=0$

B. $\left(x^2+y^2\right)(g+\lambda f)+c(x+\lambda y)=0$

C. $\left(3x^2+3y^2\right)(2g-4\lambda f)+c(x-\lambda y)=0$

D. $\left(x^2+y^2\right)(g-\lambda f)+c(x-\lambda y)=0$

Answer: B

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144. If (1,2) ,(4,3) are the limiting points of a coaxal system , then the equation of the circle in its conjugate system having minimum area is

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

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

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

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

Answer: C

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Exercise 2 Set 1

1. The equation of the circle cutting orthogonally the circles

$x^2 + y^2 - 8x - 2y + 16 = 0, x^2 + y^2 - 4x - 4y - 1 = 0$ and passing through the point (1,1) is

$3x^2 + 2y^2 - 14x + 23y - 15 = 0$.

A. only I is true

B. only II is true

C. both I and II are ture

D. neither I nor II true

Answer: A

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2. The equation of the circle which cuts orthogonally the three circles,

$x^2 + y^2 + 2x + 17y + 4 = 0, x^2 + y^2 + 7x + 6y + 11 = 0, x^2 + y^2 - x +$

is

A. only I is true

B. only II is true

C. both I and II are ture

D. neither I nor II true

Answer: B

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3. The equation of the circle described on the common chord of the circles $x^2 + y^2 + 2x = 0, x^2 + y^2 + 2y = 0$ as diameter is

A. only I is true

B. only II is true

C. both I and II are ture

D. neither I nor II true

Answer: C

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4. Find the equation of the circle which passes through the origin and intersects the circles below, orthogonally.

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

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

A. only I is true

B. only II is true

C. both I and II are ture

D. neither I nor II true

Answer: C

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5. The radical centre of the three circles described on the three sides of a triangle as diameter is .... of the triangle

A. only I is true

B. only II is true

C. both I and II are ture

D. neither I nor II true

Answer: C

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6. If A, B, C are the centres of three circles touching mutually externally then the radical centre of the circles for $\triangle$ ABC is

A. only I is true

B. only II is true

C. both I and II are ture

D. neither I nor II true

Answer: A

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7. If the eqution of the circle cutting orthogonally the circles $x^2 + y^2 - 6x = 0, x^2 + y^2 + 4x + 3y + 1 = 0$ and which has its its centre on the line x + 2y = 5 is $x^2 + y^2 - 2ax - 2by + c = 0$ then the dessending order of a,b,c is

A. a,b,c

B. b,c,a

C. b,a,c

D. a,c,b

Answer: A::B

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8. If the equation of the circle passing through the origin and the point of intersection of the two circles

$x^2 + y^2 - 4x - 6y - 3 = 0, x^2 + y^2 + 4x - 2y - 4 = 0$ is $x^2 + y^2 + 2ax$

then the ascending order of a,b,c is

A. a,b,c

B. b,c,a

C. b,a,c

D. a,c,b

Answer: A::C

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9. If the equation of the circle cutting the circle

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

orthogonally and coxal with the circles

$x^2 + y^2 + 6x + 4y - 12 = 0, x^2 4x - 6y - 12 = 0$ is $x^2 + y^2 + 2ax + 2b$

then the ascending order of a,b,c is

A. a,b,c

B. b,c,a

C. b,a,c

D. a,c,b

Answer: C::D

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Exercise 2 Set 2

1. If the equation of the circle which cuts orthogonally the circle

$x^2 + y^2 - 4x + 2y - 7 = 0$

and having centre at (2,3) is $x^2 + y^2 = 2ax + 2by + c = 0$ then the assending order of a, b, c is

A. a,b,c

B. b,c,a

C. b,a,c

D. a,c,b

Answer: A::C

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Exercise 2 Set 3

1. Match the following.

I . If $x^2 + y^2 - 6x - 8y + 12 = 0, x^2 + y^2 - 4x + 6y + k = 0$ a) 1

Cut othogonally then k =

II . If $x^2 + y^2 + 2x + 3y + k = 0, x^2 + y^2 + 8x - 6y - 7 = 0$ b) - 10

cut orthognal then k =

III. If $x^2 + y^2 + 2x - 2y + 4 = 0, x^2 + y^2 + 4x - 2ky + 2 = 0$ c) - 24

cut orthogonally then k =

A. a,b,c

B. b,c,a

C. c,b,a

D. a,c,b

Answer: A::C

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2. Match the following .

Circles

$I.\ x^2 + y^2 = 1\ \ ,x^2 + y^2 - 2x = 1, x^2 + y^2 - 2y = 1$

$II.\ x^2 + y^2 - x + 3y - 3 = 0,\ \ x^2 + y^2 - 2x + 2y + 2 = 0,\ \ x^2 + y^2 + 2x$

$III.\ x^2 + y^2 - 8x + 40 = 0, x^2 + y^2 - 5x + 16 = 0, x^2 + y^2 - 8x + 16y +$

A. a,b,c

B. b,c,a

C. c,a,b

D. a,c,b

Answer: A::B

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3. Match the following .

Limiting point	Radical axis
$I.$ (1,2),(4, 3)	a)x + y + 4 = 0
$II.$ (2,1),(− 5, − 6)	b)(3x + y - 10 =0)
$III.$ (3,2),(1,1)	c)(4x + 2y - 11=0)

A. a,b,c

B. b,a,c

C. c,a,b

D. a,c,b

Answer: B::C

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Exercise 2 Set 4

1. A : If $x^2 + y^2 - 2x + 3y + k = 0, x^2 + y^2 + 8x06y - 7 = 0$ cut each other orthogonally then k = 10 .

R : The circles

$x^2 + y^2 + 2gx + 2fy + c = 0, x^2 + y^2 + 2g'x + 2f'y + c' = 0$ cut each other orthogonally iff $2gg' + 2ff' = c + c'$

A. Both A and R are true and R is the correct explanation of A

B. Both A and R are true but R is not corrcet explanation of A

C. A is true but R is false

D. A is false but R is true .

Answer: A::D

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2. A: The equation tha common chord of the two circles $x^2 + y^2 + 2x + 3y + 1 = 0, x^2 + y^2 + 4x + 3y + 2 = 0$ is $2x + 1 = 0$.

A. Both A and R are true and R is the correct explanation of A

B. Both A and R are true but R is not corrcet explanation of A

C. A is true but R is false

D. A is false but R is true .

Answer: A::B

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3. A : The radical centre of the circles $x^2 + y^2 + 4, x^2 + y^2 - 3x = 4, x^2 + y^2 - 3x = 4, x^2 + y^2 - 4y = 4$ is (0,0).

R : Radical centre of three circles is the point of concurrence of the radical axes of the circles taken in pairs .

A. Both A and R are true and R is the correct explanation of A

B. Both A and R are true but R is not corrcet explanation of A

C. A is true but R is false

D. A is false but R is true .

Answer: A::C

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4. A: If origin is a limiting point of the coaxal system containing the circle $x^2 + y^2 + 2gx + 2fy + c = 0$ then the other limiting point is $\left(\frac{-gc}{g^2 + f^2}, \frac{-fc}{g^2 + f^2}\right)$

A. Both A and R are true and R is the correct explanation of A

B. Both A and R are true but R is not corrcet explanation of A

C. A is true but R is false

D. A is false but R is true .

Answer: A::D

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