MATHS

BOOKS - ML KHANNA

THE CIRCLE

Problem Set (1) (MULTIPLE CHOICE QUESTIONS)

1. If the equation $ax^2 + by^2 + 2hxy + 2gx + 2fy + c = 0$ represents a circle, the condition will be

A. a=b and c=0

B. f=g and h=0

C. a=b and h=0

D. f=g and c=0

Answer: C

Watch Video Solution

2. The radius of the circle

$3x^2 + 3y^2 + \lambda xy + 9x + (\lambda - 6)y + 3 = 0$

A. $3/2$

B. $2/3$

C. $\frac{1}{2}\sqrt{17}$

D. none

Answer: A

Watch Video Solution

3. The two conics $ax^2 + 2hxy + by^2 = c$ and $px^2 + 2kxy + qy^2 = r$ intersect in four concyclic points, then

A. $\frac{a-b}{p-q} = \frac{h}{k}$

B. $\frac{a-b}{p-q}=\frac{k}{h}$

C. $\frac{a+b}{p+q}=\frac{h}{k}$

D. $\frac{a+b}{p+q}=\frac{k}{h}$

Answer: A

Watch Video Solution

4. The equation of the circle passing through (4,5) having the centre at (2,2) is

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

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

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

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

Answer: B

Watch Video Solution

5. The lines $2x - 3y - 5 = 0$ and $3x - 4y = 7$ are diameters of a circle of area $154(\ = 49\pi)$ 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

Watch Video Solution

6. 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

Watch Video Solution

7. 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: C

Watch Video Solution

8. The lines joining the origin to the points of intersection of the line $4x + 3y = 24$ with the circle $(x-3)^2 + (y-4)^2 = 25$ are

A. coincident

B. perpendicular

C. make equal angle with axes

D. none

Answer: B

Watch Video Solution

9. Centre of the circle $4x^2 + 4y^2 - 10x + 5y = 0$ is

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

B. $\left(-\frac{5}{4}, \frac{5}{8}\right)$

C. $\left(\frac{5}{4}, -\frac{5}{8}\right)$

D. none

Answer: C

Watch Video Solution

10. Radius of the circle $9x^2 + y^2 = 4\left(x^2 - y^2\right) - 8x$ is

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

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

C. $\frac{8}{5}$

D. none

Answer: B

Watch Video Solution

11. Radius of the circle whose centre is on y-axis and which passes through the points (5,2) and (7,- 4) is

A. $\sqrt{5}$

B. $2\sqrt{5}$

C. $3\sqrt{5}$

D. none

Answer: B

Watch Video Solution

12. Equation of circle , concentric with circle

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

A. $3\sqrt{30}$

B. $2\sqrt{30}$

C. $\sqrt{30}$

D. none

Answer: B

Watch Video Solution

13. The equation of normal to the circle

$x^2 + y^2 - 4x + 4y - 17 = 0$

which passes through (1, 1) is

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

B. $x - y = 0$

C. $x + y = 0$

D. none

Answer: A

Watch Video Solution

14. The values of λ for which the circle

$x^2 + y^2 + 6x + 5 + \lambda\left(x^2 + y^2 - 8x + 7\right) = 0$ dwindles into a point are

A. $\frac{3 \pm 4\sqrt{2}}{3}$

B. $\frac{6 \pm 4\sqrt{2}}{3}$

C. $\frac{4 \pm 3\sqrt{2}}{3}$

D. none

Answer: B

Watch Video Solution

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

A. 5π

B. 10π

C. 25π

D. none of these

Answer: C

Watch Video Solution

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

A. $\pi/4$

B. $\pi/2$

C. π

D. 2π

Answer: C

Watch Video Solution

17. Let C be the circle with centre C(0,0) and radius 3 units. The equation of the locus of the mid-points of the chords of the circle which subtend an angle of $\frac{2\pi}{3}$ at the centre is :

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

B. $x^2 + y^2 = 27/4$

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

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

Answer: C

View Text Solution

18. If $2x^2 + pxy + 2y^2 + (p-4)x + 6y - 5 = 0$ is the equation of a circle, then its radius is

A. $2\sqrt{3}$

B. $2\sqrt{2}$

C. $\frac{1}{2}\sqrt{23}$

D. none

Answer: C

Watch Video Solution

19. The equation $\left(x^2 - a^2\right)^2 + \left(y^2 - b^2\right)^2 = 0$ represents points which are

A. collinear

B. lie on a circle centred at (0,0)

C. lie on a circle centred at (a,b)

D. none

Answer: B

Watch Video Solution

20. Equations of circles which pass through the points (1,-2) and (3,-4) and touch the x-axis is

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

B. $x^2 + y^2 + 10x + 20y + 25 = 0$

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

D. none

Answer: B::C

Watch Video Solution

21. A variable circle passes through the fixed $A(p, q)$ and touches the x-axis. Show that the locus of the other end of the diameter through A is (x-p)^2 = 4qy`.

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

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

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

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

Answer: A

Watch Video Solution

22. 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 circles, then the set of values of k is given by the interval (1) $0 < k <$ (2) $k \geq$ (3) $\prec = k \leq$ (4) $k \leq$

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

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

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

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

Answer: B

Watch Video Solution

23. Three distinct point A, B and C are given in the 2-dimensional coordinates plane such that the ratio of the distance of any one of them

from the point (1, 0) to the distance from the point (-1, 0) is equal to $\frac{1}{3}$. Then, the circumcentre of the triangle ABC is at the point

A. $\left(\frac{5}{3}, 0\right)$

B. (0, 0)

C. $\left(\frac{5}{4}, 0\right)$

D. $\left(\frac{5}{2}, 0\right)$

Answer: C

Watch Video Solution

24. Consider two circles $x^2 + y^2 - 4x - 6y - 8 = 0$ and $x^2 + y^2 - 2x - 3 = 0$ Statement 1 : Both the circles intersect each other at two distinct points. Statement 2 : The sum of radii of the two circles is greater than the distance between their centers.

A. touch

B. cut

C. one lies inside the other

D. do not intersect

Answer: B

Watch Video Solution

25. Equation of the circle with centre on y-axis and passing through the origin and (2, 3) is

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

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

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

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

Answer: B

View Text Solution

26. Radius of a circle is 5. It cuts x-axis at two points at a distance 3 from the origin. Its centre is

A. $(0, \pm 4)$

B. $(0, \pm 3)$

C. $(0, \pm 5)$

D. none

Answer: A

Watch Video Solution

27. Equation of circle passing through the points (4, 3) and (2,5) and touching the axis of y is

A. $x^2 + y^2 - 20x - 22y + 121 = 0$

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

C. $x^2 + y^2 - 10x - 6y + 13 = 0$

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

Answer: A::B

Watch Video Solution

28. $3x + 4y - 7 = 0$ is common tangent at (1, 1) to two equal circles of radius 5. Their centres are the points

A. (4, 5), (-2, -3)

B. (4, -3), (-2, 5)

C. (4, -5), (-2, 3)

D. none

Answer: A

Watch Video Solution

29. The equation to a circle whose centre lies at the point (-2,1) and which touches the line $3x - 2y - 6 = 0$ at (4, 3) is

A. $x^2 + y^2 + 4x - 2y - 35 = 0$

B. $x^2 + y^2 - 4x + 2y + 35 = 0$

C. $x^2 + y^2 + 4x + 2y + 35 = 0$

D. $x^2 + y^2 - 4x - 2y + 35 = 0$

Answer: A

Watch Video Solution

30. The equation of the circumcircle of the triangle formed by the lines $y + \sqrt{3}x = 6, y - \sqrt{3}$ x=6 and y=0 is

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

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

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

D. $x^2 + y^2 + 4x = 12$

Answer: C

Watch Video Solution

31. If (-3,2) lies on the circle $x^2 + y^2 + 2gx + 2fy + c = 0$, which is concentric with the circle $x^2 + y^2 + 6x + 8y - 5 = 0$, then c is

A. 11

B. -11

C. 24

D. none

Answer: B

Watch Video Solution

32. Equation of the circle concentric with the circle $x^2 + y^2 - 3x + 4y - c = 0$ and passing through the point [(-1,-2) is

A. $x^2 + y^2 - 3x + 4y - 1 = 0$

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

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

D. none of these

Answer: B

Watch Video Solution

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

A. 10

B. $2\sqrt{5}$

C. 6

D. 4

Answer: B

Watch Video Solution

34. Find the equation of the circle which passes through the centre of the circle $x^2 + y^2 + 8x + 10y - 7 = 0$ and is concentric with the circle $2x^2 + 2y^2 - 8x - 12y - 9 = 0$

A. $(x-4)^2 + (y-6)^2 = 185$

B. $(x-2)^2 + (y-3)^2 = 100$

C. $(x-4)^2 + (y-3)^2 = 128$

D. none

Answer: B

Watch Video Solution

35. Centre of a circle is (2, 3). If the line $x + y = 1$ touches it, its equation is

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

B. $x^2 + y^2 - 4x - 6y + 5 = 0$

C. $x^2 + y^2 - 4x - 6y - 5 = 0$

D. none of these

Answer: B

Watch Video Solution

36. The equation of the image of the circle $x^2 + y^2 + 16x - 24y + 183 = 0$ by the line mirror $4x + 7y + 13 = 0$ is

A. $x^2 + y^2 + 32x - 4y + 235 = 0$

B. $x^2 + y^2 + 32x + 4y - 235 = 0$

C. $x^2 + y^2 + 32x - 4y - 235 = 0$

D. $x^2 + y^2 + 32x + 4y + 235 = 0$

Answer: D

Watch Video Solution

37. The circle whose centre is on the x-axis and the line $4x - 3y - 12 = 0$ and whose radius is the distance between the lines $4x - 3y - 32 = 0$ and $4x - 3y - 12 = 0$ has equation

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

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

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

D. none

Answer: A

Watch Video Solution

38. The points (2,3), (0,2),(4,5) and (0,c) are coricyclic if the value of c is

A. 2

B. 1

C. 17

D. 3

Answer: A::C

Watch Video Solution

39. The circle passing through three distinct points (1,k), (k, 1) and (k, k) passes through the points

A. (1,1)

B. (-1,-1)

C. (-1,1)

D. (1,-1)

Answer: A

Watch Video Solution

40. If the lines $a_1x + b_1y + c_1 = 0$ and $a_2x + b_2y + c_2 = 0$ cut the coordinate axes in concyclic points, then

A. $a_1a_2 = b_1b_2$

B. $a_1b_1 = a_2b_2$

C. $a_1 / a_2 = b_1 / b_2$

D. none

Answer: A

Watch Video Solution

41. If a circle passes through the points where the lines $3\lambda x - 2y - 1 = 0$ and $4x - 3y + 2 = 0$ meet the coordinate axes then

$\lambda =$

A. -1

B. $-1/2$

C. $1/2$

D. 1

Answer: C

Watch Video Solution

42. Four distinct points $(2\lambda, 3\lambda)$, (1,0), (0, 1) and (0,0) lie on a circle for

A. all integral values of λ

B. $0 < \lambda < 1$

C. $\lambda < 0$

D. only one value of λ

Answer: D

Watch Video Solution

43. If $x^2 + y^2 + \lambda x + (1 - \lambda)y + 5 = 0$ represents a circle whose radius cannot exceed 5, then the number of integral values of λ is

A. 14

B. 16

C. 18

D. none

Answer: B

Watch Video Solution

44. If a chord of the circle $x^2 + y^2 = 8$ makes equal intercepts of length a on the coordinate axes then

A. $|a| < 8$

B. $|a| < 4\sqrt{2}$

C. $|a| < 4$

D. $|a| > 4$

Answer: C

Watch Video Solution

45. The position of point (1, 2) w.r.t. the circle $x^2 + y^2 - 2x + 6y + 1 = 0$ is

A. inside

B. outside

C. on

D. none

Answer: B

Watch Video Solution

46. The line $3x + 5y + 9 = 0$ w.rt. the circle $x^2 + y^2 - 4x + 6y + 5 = 0$ is

A. chord

B. diameter

C. tangent

D. none

Answer: B

Watch Video Solution

47. Equation of a circle passing through origin is $x^2 + y^2 - 6x + 2y = 0$. What is the equation of one of its diameter ?

A. $x + 3y = 0$

B. $x + y = 0$

C. $x = y$

D. $3x + y = 0$

Answer: A

Watch Video Solution

48. Equation of the diameter of the circle $x^2 + y^2 - 2x + 4y = 0$ which passes through the origin is

A. $x + 2y = 0$

B. $x - 2y = 0$

C. $2x + y = 0$

D. $2x - y = 0$

Answer: C

Watch Video Solution

49. The end A of diameter AB of a circle is (1, 1) and B lies on the line $x + y - 3 = 0$. The locus of the centre of the circle is

A. $x - y = 1$

B. $x + y = 1$

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

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

Answer: C

Watch Video Solution

50. AB is a diameter of the circle $x^2 + y^2 = 4$. If p_1 and p_2 be the lengths of perpendiculars from A and B on the line $x + y = 1$, then maximum value of $p_1 p_2$ is:

A. $1/2$

B. $7/2$

C. 1

D. 2

Answer: B

Watch Video Solution

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

A. (-1, -1)

B. (1, 2)

C. (4, 3)

D. none

Answer: B

Watch Video Solution

52. Which of the following lines is a normal to the circle $(x-1)^2+(y-2)^2=10$

A. $2x+y=3$

B. $x+2y=10$

C. $x+y=13$

D. $x+y=3$

Answer: D

Watch Video Solution

53. If (x, 3) and (3,5) are the extremities of a diameter of a circle with centre at (2, y), then the value of x and y are

A. x = 1, y = 4

B. x = 4, y = 1

C. x = 8, y = 2

D. none of these

Answer: A

Watch Video Solution

54. Equation of the circle having diameters $2x - 3y = 5$ and $3x - 4y = 7$ and radius 8 is

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

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

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

D. none of these

Answer: A

Watch Video Solution

55. The equation of the circle passing through the point (2, -1) and having two diameters along the pair of lines $2x^2 + 6y^2 - x + y - 7xy - 1 = 0$ is

A. $x^2 + y^2 + 10x + 6y - 19 = 0$

B. $x^2 + y^2 + 10x - 6y + 19 = 0$

C. $x^2 + y^2 + 10x + 6y + 19 = 0$

D. none

Answer: A

Watch Video Solution

56. Tangents drawn from the point P(1,8) to the circle $x^2 + y^2 - 6x - 4y - 11 = 0$ touch the circle at the points A and B. The equation of the circumcircle of the triangle PAB is:

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

B. $x^2 + y^2 - 4x - 10y + 19 = 0$

C. $x^2 + y^2 - 2x + 6y - 29 = 0$

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

Answer: B

Watch Video Solution

57. The co-ordinates of A and B are (x_1, y_1) and (x_2, y_2) and O is the origin. If circles be described on OA, OB as diameters, then length of common chord is

A. $(x_1y_2 - x_2y_1)/AB$

B. $(x_1y_1 - x_2y_2)/AB$

C. $(x_1y_2 + x_2y_1)/AB$

D. $(x_1y_1 + x_2y_2)/AB$

Answer: A

Watch Video Solution

58. If the abscissa and ordinates of two points $PandQ$ are the roots of the equations $x^2 + 2ax - b^2 = 0$ and $x^2 + 2px - q^2 = 0$, respectively, then find the equation of the circle with PQ as diameter.

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

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

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

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

Answer: A

Watch Video Solution

59. The centres of the circles $x^2 + y^2 - 6x - 8y - 7 = 0$ and $x^2 + y^2 - 4x - 10y - 3 = 0$ are the ends of the diameter of the circles

A. $x^2 + y^2 - 5x - 9y + 26 = 0$

B. $x^2 + y^2 + 5x - 9y + 14 = 0$

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

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

Answer: A

Watch Video Solution

60. The lines joining the origin to the points of intersection of the line $4x + 3y = 24$ with the circle $(x - 3)^2 + (y - 4)^2 = 25$ are

A. coincident

B. perpendicular

C. equally inclined to x-axis

D. none of these

Answer: B

Watch Video Solution

61. Let $PQandRS$ be tangent at the extremities of the diameter PR of a circle of radius r. If $PSandRQ$ intersect at a point X on the circumference of the circle, then prove that $2r = \sqrt{PQxRS}$.

A. $\sqrt{PQ.\ RS}$

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

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

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

Answer: A

Watch Video Solution

62. The intercept cut on y-axis by the circle whose diameter is the line joining the points (-4,3) and (12,-1) is

A. $2\sqrt{13}$

B. $4\sqrt{13}$

C. $6\sqrt{13}$

D. none

Answer: B

Watch Video Solution

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

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

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

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

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

Answer: A

Watch Video Solution

64. If a straight line through $C(-\sqrt{8}, \sqrt{8})$ making an angle of 135° with the x-axis cuts the circle $x = 5\cos\theta, y = 5\sin\theta$ in points A and B, then the length of AB is

A. 6

B. 8

C. 10

D. none

Answer: C

Watch Video Solution

65. The vertices of a right angled triangle are A(2,-2), B(-2,1) and C (5,2). The equation of circumcircle is

A. $(x-2)(x+2)+(y+2)(y+1)=0$

B. $(x+2)(x-5)+(y-1)(y-2)=0$

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

D. none

Answer: B

Watch Video Solution

66. A square is inscribed in the circle $x^2+y^2-2x+4y+3=0$. Its sides are parallel to the coordinate axes. One vertex of the square is $(1+\sqrt{2},\ -2)$ (b) $(1-\sqrt{2},\ -2)$ $(1,\ -2+\sqrt{2})$ (d) none of these

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

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

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

D. none of these

Answer: D

Watch Video Solution

67. A rectangle ABCD is inscribed in the circle $x^2 + y^2 + 3x + 12y + 2 = 0$. If the co-ordinates of A and B are (3,-2) and (-2,0) then the other two vertices of the rectangle are

A. (-6, -10)

B. (-1, -12)

C. (1, 12)

D. (6, 10)

Answer: A::B

Watch Video Solution

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

A. (7, 4)

B. (4, 7)

C. (3, 7)

D. $(3/8, 4)$

Answer: B

Watch Video Solution

69. A, B, C are three points on the unit circle $x^2 + y^2 = 1$ whose parametric angles are θ, ϕ and Ψ respectively. Through a point P(-1,0) on the circle chords PA, PB, PC are drawn whose lengths are in G.P. then $\cos\frac{\theta}{2}, \cos\frac{\phi}{2}, \cos\frac{\Psi}{2}$ are in

A. A.P.

B. G.P.

C. H.P.

D. None of these

Answer: B

View Text Solution

70. A square is inscribed in the circle $x^2 + y^2 - 2x + 4y - 93 = 0$ with its sides parallel to the co-ordinate axes. The co-ordinates of its vertices are

A. (-6,-9),(-6,5),(8,-9), (8,5)

B. (-6,9),(-6,-5),(8,-9), (8,5)

C. (-6,-9),(-6,5), (8,9),(8,5)

D. (-6, -9),(-6,5), (8,-9), (8,-5)

Answer: A

View Text Solution

71. If α, β, γ are the parameters of points A,B,C on the circle $x^2 + y^2 = a^2$ and if the triangle ABC is equilateral ,then

A. $\Sigma \cos \alpha = 0$

B. $\Sigma \sin \alpha = 0$

C. $\Sigma \tan \alpha = 0$

D. $\Sigma \cot \alpha = 0$

Answer: A::B

Watch Video Solution

72. An isosceles triangle ABC with vertex at A(0,0) is inscribed in the circle $x^2 + y^2 = a^2$. If the base angles B and C be each 75°, then the co-

ordinates of B and C are

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

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

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

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

Answer: B::D

View Text Solution

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

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

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

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

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

Answer: D

View Text Solution

74. (-1,2) is the vertex of an equilateral triangle whose centroid is (1, 1), then the equation of its circumcircle is

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

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

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

D. none

Answer: C

Watch Video Solution

75. The equation of the circle inscribed in the triangle formed by the coordinate axes and the lines $12x + 5y = 60$ is :

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

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

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

D. none

Answer: B

Watch Video Solution

76. If the equation of incircle of an equilateral triangle is $x^2 + y^2 + 4x - 6y + 4 = 0$, then the equation of circumcircle of the triangle is

A. $(-2, -3), 6$

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

C. $(2, 3), 6$

D. none

Answer: B

Watch Video Solution

77. The triangle PQR is inscribed in the circle $x^2 + y^2 = 25$. If Q and R have co-ordinates(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

Watch Video Solution

78. The vertices of a triangle ABC are the points (6,0),(0,6) and (7,7). The equation of the circle inscribed in the triangle is

A. $x^2 + y^2 - 9x - 9y + 36 = 0$

B. $x^2 + y^2 - 9x - 9y - 36 = 0$

C. $x^2 + y^2 - 9x + 9y + 36 = 0$

D. $x^2 + y^2 + 9x - 9y + 36 = 0$

Answer: A

View Text Solution

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

A. 2r

B. 4r

C. $\sqrt{2}r$

D. none

Answer: D

Watch Video Solution

80. If the origin lies inside the circle

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

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

B. $\frac{3\sqrt{3}}{4}r^2$

C. $3\sqrt{3}r^2$

D. none

Answer: B

Watch Video Solution

81. If the vertices of a triangle ABC are $A(-4, -1)$, $B(1, 2)$ and C (4, -3), then the coordinates of the circumcentre of the triangle are,

A. (0, 2)

B. (0, -2)

C. (-2, 0)

D. (2, 0)

Answer: B

Watch Video Solution

82. ABCD is a square of side a. The centre of the circle which circumscribes the square on taking AB and AD as axes is

A. (a, -a)

B. (-a, a)

C. $(1/2, a/2)$

D. none

Answer: C

View Text Solution

83. The equation of a circle with centre at origin and passing through the vertices of an equilateral triangle whose median is of length 3a is

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

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

C. $x^2 + y^2 = 9a^2$

D. none

Answer: B

View Text Solution

84. A circle is inscribed in an equilateral triangle of side a. The area of any square inscribed in this circle is _____.

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

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

C. $\frac{a^2}{6}$

D. none

Answer: C

Watch Video Solution

85. The lines $3x - 4y + 4 = 0$ and $3x - 4y - 5 = 0$ are tangents to the same circle. The radius of this circle is

A. $9/5$

B. $9/10$

C. $1/5$

D. $1/10$

Answer: B

View Text Solution

86. If lines $3x - 4y + 4 = 0$ and $6x - 8y - 7 = 0$ touch the same circle , then its radius is

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

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

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

D. none

Answer: B

Watch Video Solution

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

A. $(x-9)^2 + (y-6)^2 = 5^2$

B. $(x-9)^2 + (y-8)^2 = 5^2$

C. $(x-7)^2 + (y-3)^2 = 5^2$

D. none

Answer: B

Watch Video Solution

88. Two circles each of radius 5 units touch each other at (1, 2). If the equation of their common tangent is $4x + 3y = 10$, then the centres of the two circles are

A. (3,4),(-1,0)

B. (5,7),(-3,-3)

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

D. none of these

Answer: C

View Text Solution

89. The equation of the circle which has a tangent $2x - y - 1 = 0$ at P (3,5) on it and with centre on $x + y - 5 = 0$ is

A. $x^2 + y^2 + 6x - 16y + 28 = 0$

B. $x^2 + y^2 - 6x + 16y - 28 = 0$

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

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

Answer: A

View Text Solution

90. Centre of the circle whose radius is 3 and which touches internally the circle $x^2 + y^2 - 4x - 6y - 12 = 0$ at the point (-1 -1) is

A. $\left(x - \frac{4}{5}\right)^2 + \left(y + \frac{7}{5}\right)^2 = 3^2$

B. $\left(x + \frac{4}{5}\right)^2 + \left(y - \frac{7}{5}\right)^2 = 3^2$

C. $\left(x - \frac{4}{5}\right)^2 + \left(y - \frac{7}{5}\right)^2 = 3^2$

D. $\left(x-\frac{4}{5}\right)^2+\left(y-\frac{7}{5}\right)^2=3^2$

Answer: C

Watch Video Solution

91. A square is inscribed in the circle $x^2+y^2-10x-6y+30=0$. One side of the square is parallel to $y=x+3$, then one vertex of the square is

A. (3, 3)

B. (7, 3)

C. $\left(6, 3-\sqrt{3}\right)$

D. $\left(6, 3+\sqrt{3}\right)$

Answer: A::B

View Text Solution

92. The centres of the two circles each of radius 13-units and having a common tangent $5x + 12y - 17 = 0$ at (1, 1) are

A. (-6, -13) and (8, 15)

B. (6,13) and (-4,- 11)

C. (5, 12) and (-3,-10)

D. none of these

Answer: B

View Text Solution

93. A variable circle passes through a fixed point A(a,b) and touches the axis of x. Locus of the other end of the diameter through A is

A. circle

B. parabola

C. ellipse

D. none of these

Answer: B

View Text Solution

94. 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. hyperbola

B. parabola

C. an ellipse

D. a circle

Answer: B

View Text Solution

95. If the two circles $x^2 + y^2 = 9$ and $x^2 + y^2 - 8x - 6y + \lambda^2 = 0$ have exactly two common tangents, then the number of integral values of λ is

A. 2

B. 8

C. 9

D. none

Answer: C

View Text Solution

96. The number of integral values of λ for which the equation $x^2 + y^2 + \lambda x + (1 - \lambda)y + 5 = 0$ is the equation fo a circle whose radius cannot exceed $5,$ is 14 (b) 18 (c) 16 (d) none of these

A. 18

B. 16

C. 14

D. none

Answer: B

Watch Video Solution

97. Locus of a point which moves such that sum of the squares of its distances from the sides of a square of side unity is 9, is

A. straight line

B. circle

C. parabola

D. none

Answer: B

View Text Solution

98. The locus of a point which moves such that the sum of the square of its distance from three vertices of a triangle is constant is a/an circle (b) straight line (c) ellipse (d) none of these

A. circle

B. straight line

C. ellipse

D. none

Answer: A

Watch Video Solution

99. The equation $x = a\cos\theta + b\sin\theta$ and $y = a\sin\theta - b\cos\theta, 0 \leq \theta \leq 2\pi$ together represent

A. parabola

B. straight line

C. ellipse

D. circle

Answer: D

View Text Solution

100. Locus of the centre of the circle which always passes through the fixed points (a,0) and (-a,0) is

A. $x = 1$

B. $x + y = 6$

C. $x + y = 2a$

D. $x = 0$

Answer: D

View Text Solution

101. Circles are drawn through the point (-5,0) to cut the x-axis on +ive side and making an intercept of 10 units on x-axis. Locus of the centre of such circles is

A. x=0

B. y=0

C. x+y=0

D. x-y=0

Answer: A

View Text Solution

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

A. a circle

B. a pair of two distinct straight lines

C. a pair of coincident straight lines

D. a point

Answer: D

View Text Solution

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

A. circle

B. ellipse

C. pair of lines

D. no real curve

Answer: D

Watch Video Solution

104. The line joining $(5, 0)$ to $(10\cos\theta, 10\sin\theta)$ is divided internally in the ratio $2:3$ at P then the locus of P is

A. a pair of straight lines

B. a circle

C. a straight line

D. none of these

Answer: B

Watch Video Solution

105. Let AB be a chord of the circle $x^2 + y^2 = r^2$ subtending a right angle at the centre. Then the locus of the centroid of the 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

View Text Solution

106. The circles $x^2 + y^2 - 4x - 81 = 0, x^2 + y^2 + 24x - 81 = 0$ intersect each other at points A and B, a line through point A meets one circle at P and a parallel line through B meets the other circle at Q. Then the locus of the mid-point of PQ is

A. $(x + 5)^2 + (y + 0)^2 = 25$

B. $(x - 5)^2 + (y - 0)^2 = 25$

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

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

Answer: A::C

View Text Solution

107. A line is drawn through a fixed point P(h, k) to cut the circle $x^2 + y^2 = a^2$ at A and B. Then PA, PB is equal to

A. $(h + k)^2 - a^2$

B. $h^2 + k^2 - a^2$

C. $(h - k)^2 + a^2$

D. none of these

Answer: B

View Text Solution

108. If (2,5) is an interior point of the circle $x^2 + y^2 - 8x - 12y + k = 0$ and the circle neither cuts nor touches any one of the axes of co-ordinates, then

A. $k \in (36, 47)$

B. $k \in (16, 47)$

C. $k \in (16, 36)$

D. none of these

Answer: A

View Text Solution

109. The point $(\lambda, 4)$ lies outside the circles

$S_1 = x^2 + y^2 + 10x = 0$ and

$S_2 = x^2 + y^2 - 12x + 20 = 0$ then λ belong to

A. $(-\infty, -8) \cup (-2, \infty)$

B. $(-8, -2)$

C. $(-\infty, -8) \cup (-2, 6) \cup (6, \infty)$

D. none

Answer: C

View Text Solution

110. The point on the circle $x^2 + y^2 - 2x - 4y - 11 = 0$ which is farthest from the origin is

A. $\left(1 + \frac{8}{\sqrt{5}}, 2 + \frac{4}{\sqrt{5}}\right)$

B. $\left(1 + \frac{4}{\sqrt{5}}, 2 + \frac{8}{\sqrt{5}}\right)$

C. $\left(2 + \frac{8}{\sqrt{5}}, 1 + \frac{4}{\sqrt{5}}\right)$

D. none

Answer: B

View Text Solution

111. The co-ordinates of the point on the circle $x^2 + y^2 - 12x + 4y + 30 = 0$ which is farthest from the origin are

A. (8, 5)

B. (12, 4)

C. (9, 3)

D. none

Answer: C

View Text Solution

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

A. $-35 < m < 15$

B. $15 < m < 65$

C. $35 < m < 85$

D. $-85 < m < -35$

Answer: A

Watch Video Solution

113. If the equation $x\cos\theta + y\sin\theta = p$ represents the equation of common chord APQB of the circles $x^2 + y^2 = a^2$ and $x^2 + y^2 = b^2 (a > b)$ then AP =

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

B. $\sqrt{a^2 + p^2} - \sqrt{b^2 + p^2}$

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

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

Answer: D

Watch Video Solution

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

A. 30°

B. 45°

C. 60°

D. 90°

Answer: D

Watch Video Solution

115. If the circles $x^2 + y^2 - 4x - 4y = 0$ and $x^2 + y^2 - 16 = 0$ intersect in two distinct points P and Q the then line $5x + by - a = 0$ passes through P and Q for :

A. infinitely many values of a

B. exactly two values of a

C. exactly one value of a

D. no value of a

Answer: D

View Text Solution

116. A diameter of $x^2 + y^2 - 2x - 6y + 6 = 0$ is a chord to circle centre (2, 1), then radius of the circle is

A. 1

B. 2

C. 3

D. 4

Answer: C

Watch Video Solution

117. Two circles touch the x-axis and the line y=mx. They meet at (9,6) and at one more point and the product of their radii is $\frac{117}{2}$, then the value of m is

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

B. $\sqrt{2}$

C. $2\sqrt{2}$

D. None

Answer: C

View Text Solution

118. Consider, $L_1 : 2x + 3y + p - 3 = 0$, $L_2 : 2x + 3y + p + 3 = 0$, where p is a real number, and $C : x^2 + y^2 + 6x - 10y + 30 = 0$

Statement-I : If line L_1 is a chord of circle C, then line L_2 is not always a diameter of circle C.

and

Statement-II : If line L_1 is a diameter of circle C, then line L_2 is not a chord of circle C.

Watch Video Solution

Problem Set (1) (TRUE AND FALSE)

1. Circle on which the co-ordinates of any point are $\{2+4\cos\theta,\ -1+4\sin\theta\}$ where θ is parameter is $(x-2)^2+(y+1)^2=16.$

Watch Video Solution

2. The locus of the point of intersection of the lines $x=\mathrm{a}\frac{1+t^2}{1-t^2}, y=\frac{2at}{1-t^2}$ is a circle of radius a,t being parameter. Is it true or false ?

Watch Video Solution

3. The equation $x^2+y^2+2x-10y+30=0$ represents a circle.

Watch Video Solution

Problem Set (1) (FILL IN THE BLANKS)

1. The equation of the circle which passes through the point (4, 5) and has its centre at (2, 2) is .....

Watch Video Solution

2. A circle has radius 3 units and its centre lies on $y = x - 1$. If it passes through the point (7, 3) its equation is .....

Watch Video Solution

3. The parametric equations of the circle

$x^2 + y^2 + x + \sqrt{3}y = 0$ are .....

Watch Video Solution

4. The points of intersection of the line $4x - 3y - 10 = 0$ and the circle $x^2 + y^2 - 2x + 4y - 20 = 0$ are ..... and .....

Watch Video Solution

5. The extremities of the diameter of a circle are (1, 2) and (3, 4). Then its centre is ....., radius ..... and equation is ..... .

Watch Video Solution

6. How are the following points (0, 1), (3, 1) and (1,3) situated w.r.t. the circle $x^2 + y^2 - 2x - 4y + 3 = 0$?

Watch Video Solution

7. Radius of the circle $(x - a)(x - b) + (y - p)(y - q) = 0$ is .....

Watch Video Solution

8. The equation $2x^2 + 2y^2 - 6x + 8y + k = 0$ represents a point circle if k is equal to .....

Watch Video Solution

9. If the two circle

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

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

Watch Video Solution

10. The locus of a point which divides the join A(-1,1) and a variable point on the circle $x^2 + y^2 = 4$ in the ratio 3:2 is .....

Watch Video Solution

Problem Set (2) (MULTIPLE CHOICE QUESTIONS)

1. If the line $lx + my = 1$ be a tangent to the circle $x^2 + y^2 = a^2$, then the point (l, m) lies on

A. ellipse

B. parabola

C. circle

D. none

Answer: C

Watch Video Solution

2. The equation of tangents drawn from the origin to the circle $x^2 + y^2 - 2rx - 2hy + h^2 = 0$ are

A. $x = 0$

B. $y = 0$

C. $(h^2 - r^2)x - 2rhy = 0$

D. $\left(h^2 - r^2\right)x + 2rhy = 0$

Answer: A::C

Watch Video Solution

3. Find the angle between the two tangents from the origin to the circle $(x-7)^2 + (y+1)^2 = 25$

A. $\pi/3$

B. $\pi/6$

C. $\pi/2$

D. 0

Answer: C

Watch Video Solution

4. The condition so that the line

$(x+g)\cos\theta+(y+f)\sin\theta=k$

is a tangent to $x^2+y^2+2gx+2fy+c=0$ is

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

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

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

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

Answer: A

Watch Video Solution

5. The angle between a pair of tangents drawn from a point T to the circle $x^2+y^2+4x-6y+9\sin^2\alpha+13\cos^2\alpha=0$ is . The equation of the locus of the point T is

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

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

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

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

Answer: D

View Text Solution

6. From any point on the circle $x^2 + y^2 = a^2$ tangents are drawn to the circle $x^2 + y^2 = a^2 \sin^2 \alpha$. The angle between them is

A. $\alpha / 2$

B. α

C. 2α

D. none of these

Answer: C

Watch Video Solution

7. If from any point P on the circle $x^2 + y^2 + 2gx + 2fy + c = 0$, tangents are drawn to the circle $x^2 + y^2 + 2gx + 2fy + c\sin^2\alpha + (g^2 + f^2)\cos^2\alpha = 0$, then find the angle between the tangents.

A. α

B. 2α

C. $\alpha/2$

D. none

Answer: B

Watch Video Solution

8. The angle at which the circle $x^2 + y^2 = 16$ can be seen from the point (8,0) is

A. $\pi/6$

B. $\pi/4$

C. $\pi/2$

D. $\pi/3$

Answer: D

Watch Video Solution

9. If $3x + y = 0$ is a tangent to a circle whose center is $(2, -1)$, then find the equation of the other tangent to the circle from the origin.

A. $x - 3y = 0$

B. $x + 3y = 0$

C. $3x - y = 0$

D. $x + 2y = 0$

Answer: A

Watch Video Solution

10. The length of the chord of the circle $x^2 + y^2 = 25$ joining the points, tangents at which intersect at an angle of 120° is

A. $5/2$

B. 5

C. 10

D. none of these

Answer: B

Watch Video Solution

11. If the two circles $x^2 + y^2 + 2gx + 2fy = 0$ and $x^2 + y^2 + 2g_1x + 2f_1y = 0$ touch each other, then

A. $f^2 + g^2 = f_1^2 + g_1^2$

B. $ff_1 = gg_1$

C. $f/f_1 = g/g_1$

D. none of these

Answer: C

Watch Video Solution

12. Aline meets the co-ordinate axes in A and B.A circle is circumscribed about the triangle OAB. The distances from the end points of the side AB to the line touching the circle at the origin O are equal to pand g respectively. The diameter of the circle is

A. $p(p+q)$

B. $alp+q)$

C. $p+q$

D. $\frac{1}{2}(p+q)$

Answer: C

View Text Solution

13. The tangent to the circle $x^2 + y^2 = 5$ at the point $(1, -2)$ also touches the circle $x^2 + y^2 - 8x + 6y + 20 = 0$ at the point

A. (-2, 1)

B. (-3, 0)

C. (-1, -1)

D. (3, -1)

Answer: D

Watch Video Solution

14. P and Q are two symmetrical points about the tangent at origin to the circle $x^2 + y^2 - x + y = 0$. If P be (-5,6), then Q is

A. (6, 5)

B. (5, 6)

C. (6, -5)

D. (-6, 5)

Answer: C

Watch Video Solution

15. Equation of tangent to the circle $x^2 + y^2 = 50$ at the point where the line $x + 7 = 0$ meets the circle

A. $7x + y = 50$

B. $x + 7y = 50$

C. $x \pm 7y = 50$

D. $7x \pm y = 50$

Answer: D

Watch Video Solution

16. If $x + y = 2$ is a tangent to $x^2 + y^2 = 2$, then the equation of the tangent at the same point of contact to the circle $x^2 + y^2 + 3x + 3y - 8 = 0$ is

A. $x - y = 6$

B. $x + y = 6$

C. $x + y = 2$

D. none

Answer: C

Watch Video Solution

17. To which of the following circles, the line $y - x + 3 = 0$ is normal at the point $\left(3 + 3/\sqrt{2}, 3/\sqrt{2}\right)$?

A. $\left(x-3-3/\sqrt{2}\right)^2+\left(y-3/\sqrt{2}\right)^2=9$

B. $\left(x-3/\sqrt{2}\right)^2+\left(y-3/\sqrt{2}\right)^2=9$

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

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

Answer: D

Watch Video Solution

18. 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

Watch Video Solution

19. Find the equations of the tangents to the circle $x^2 + y^2 = 169$ at $(5, 12)$ and $(12, -5)$ and prove that they cut at right angles. Also find their point of intersection.

A. parallel

B. perpendicular

C. coincide

D. none

Answer: B

Watch Video Solution

20. Equation of a tangent to the circle $x^2 + y^2 = 25$ passing through (-2,11) is

A. $4x + 3y = 25$

B. $3x + 4y = 38$

C. $24x - 7y + 125 = 0$

D. $7x + 24y = 230$

Answer: A::C

Watch Video Solution

21. If line $3x + y = 0$ be a tangent to a circle drawn from origin to a circle centred at the point (2,- 1) then the equation of other tangent through the origin is

A. $x - 3y = 0$

B. $x + 2y = 0$

C. $x + 3y = 0$

D. $3x - y = 0$

Answer: A

Watch Video Solution

22. Tangents drawn froin the point' (4,3) to the circle $x^2 + y^2 - 2x - 4y = 0$ are inclined at an angle

A. $\pi/6$

B. $\pi/4$

C. $\pi/3$

D. $\pi/2$

Answer: D

Watch Video Solution

23. Tangents are drawn to the circle $x^2 + y^2 - 2x - 4y - 4 = 0$ from the point (1, 7), then slopes are

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

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

C. 1, 2

D. 3, 0

Answer: A

Watch Video Solution

24. If $a > 2b > 0$, then find 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 $(x-a)^2 + y^2 = b^2$.

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

Watch Video Solution

25. The number of tangents that can be drawn from the point (8,6) to the circle $x^2 + y^2 - 100 = 0$ is

A. 0

B. 1

C. 2

D. none

Answer: B

Watch Video Solution

26. The number of tangents that can be drawn from the point (0,1) to the circle $x^2 + y^2 - 2x - 4y = 0$ is

A. 0

B. 1

C. 2

D. none

Answer: A

Watch Video Solution

27. The equation of the circle which has a tangent $2x - y - 1 = 0$ at (3, 5) on it and with the centre on $x + y = 5$, is

A. $x^2 + y^2 + 6x - 16y + 28 = 0$

B. $x^2 + y^2 - 6x + 16y - 28 = 0$

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

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

Answer: A

Watch Video Solution

28. Equation of a circle touching the line $|x-2|+|y-3|=4$ is $(x-2)^2+(y-3)^2=R^2$ where $R^2=$

A. 4

B. 8

C. 10

D. 12

Answer: B

Watch Video Solution

29. A variable circle always touches the line y-x=0 and passes though the point (0,0), the common chords of above cirlce and $x^2+y^2+6x+8y-7=0$ will pass through fixed point , whose coordinates are

A. (1, 1)

B. (2, 2)

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

D. none

Answer: C

Watch Video Solution

30. A circle passes through the point (-1,7) and touches the line y = x at (1, 1). Its diameter is

A. $4\sqrt{2}$

B. 5

C. $5\sqrt{2}$

D. 6

Answer: C

Watch Video Solution

31. The equation of a circle which has its centre on the positive side of x-axis and cuts off a chord of length 2 along the line $\sqrt{3}y - x = 0$ and also touches the line y = x is

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

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

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

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

Answer: B

Watch Video Solution

32. The locus of the point of intersection of tangents to the circle $x = a\cos\theta, y = a\sin\theta$ at the points, whose parametric angles differ by $\pi/2$, is

A. straight line

B. circle

C. ellipse

D. none

Answer: B

Watch Video Solution

33. If the tangent from a point P to the circle $x^2 + y^2 = 1$ is perpendicular to the tangent from P to $x^2 + y^2 = 3$ then the locus of P is a circle of radius

A. 4

B. 3

C. 2

D. none

Answer: C

Watch Video Solution

34. The locus of the point of intersection of tangents to the circle $x^2 + y^2 = a^2$ at the points whose parametric angles differ by $\pi/3$ is

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

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

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

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

Answer: C

Watch Video Solution

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

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

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

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

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

Answer: A

Watch Video Solution

36. If θ_1, θ_2 be the inclination of tangents with x-axis drawn from the point P to the circle $x^2 + y^2 = a^2$, then the locus of P, if given that $\cot\theta_1 + \cot\theta_2 = c$ is

A. $c\left(x^2 - a^2\right) = 2xy$

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

C. $c\left(y^2 - a^2\right) = 2xy$

D. none

Answer: C

Watch Video Solution

37. Locus of a point from which perpendicular tangents can be drawn to the circle $x^2 + y^2 = a^2$ is

A. circle through origin

B. circle of radius 2a

C. concentric circle of radius $a\sqrt{2}$

D. none

Answer: C

Watch Video Solution

38. Tangents are drawn from the point (17, 7) to the circle $x^2 + y^2 = 169$.

STATEMENT-1 : The tangents are mutually perpendicular.

because

STATEMENT-2 : The locus of the points from which mutually perpendicular tangents can be drawn to the given circle is $x^2 + y^2 = 338$.

Watch Video Solution

39. A chord AB of circle $x^2 + y^2 = a^2$ touches the circle $x^2 + y^2 - 2ax = 0$.Locus of the point of intersection of tangens at A and B is :

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

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

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

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

Answer: A::D

Watch Video Solution

40. If the line $x\cos\alpha + y\sin\alpha = p$ and the circle $x^2 + y^2 = a^2$ intersect at A and B then the equation of the circle on AB as diamerter is

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. none of these

Answer: A

Watch Video Solution

41. 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

Watch Video Solution

42. The length of tangent from the point(1, 2) to the circle $2x^2 + 2y^2 + 6x - 6y + 3 = 0$ is

A. $\sqrt{3}$

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

C. $2\sqrt{3}$

D. none

Answer: B

Watch Video Solution

43. The area of the triangle formed by +ive x-axis and the normal and tangent to the circle $x^2 + y^2 = 4at(1, \sqrt{3})$ is

A. $\sqrt{3}$

B. $2\sqrt{3}$

C. $3\sqrt{2}$

D. none

Answer: B

Watch Video Solution

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

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

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

C. $5x - 12y + 19 = 0$

D. $12x - 5y + 19 = 0$

Answer: B

Watch Video Solution

45. The circles $x^2 + y^2 + 2x - 4y + 4 = 0$ and $x^2 + y^2 - 2x - 4y + 4 = 0$ are such that they

A. touch internally

B. touch externally

C. intersect on axis of y

D. touch at (0, 2)

Answer: B::D

Watch Video Solution

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

A. 4

B. 6

C. 2

D. 8

Answer: A

Watch Video Solution

47. If the circle $x^2+y^2+2gx+2fy+c=0$ is touched by $y=x$ at P such that $OP=6\sqrt{2}$, then the value of c is

A. 36

B. 144

C. 72

D. none of these

Answer: C

Watch Video Solution

48. Two tangents OA and OB are drawn to the circle $x^2 + y^2 + 4x + 6y + 12 = 0$ from origin O. The circumradius of ΔOAB is :

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

B. 1

C. 2

D. $\frac{1}{2}\sqrt{13}$

Answer: D

Watch Video Solution

49. Tangents are drawn to the circle $x^2 + y^2 = 25$ from the point (13, 0).

They include an angle

A. $\tan^{-1}\frac{5}{12}$

B. $\tan^{-1}\frac{12}{5}$

C. $2\tan^{-1}\frac{5}{12}$

D. none

Answer: C

Watch Video Solution

Problem Set (2) (TRUE AND FALSE)

1. The straight line $7y - x = 5$ touches the circle $x^2 + y^2 - 5x + 5y = 0$

at (1, 2) then parallel tangent is $7y - x + 30 = 0$.

Watch Video Solution

2. If the tangent from P to the circle $x^2 + y^2 = 1$ is perpendicular to the tangent from P to the circle $x^2 + y^2 = 3$, then P lies on a circle of radius 2 concentric with the given circles.

Watch Video Solution

Problem Set (2) (FILL IN THE BLANKS)

1. The equation of pair of tangents drawn from the point (0,1) to the circle $x^2 + y^2 - 2x + 4y = 0$ is–

Watch Video Solution

2. The equation of tangent to the circle $x^2 + y^2 = a^2$ which makes with axes a triangle of area a^2 is :

Watch Video Solution

3. Find the equation of the tangents to the circle $x^2 + y^2 - 2x - 4 = 0$ which are (i) parallel (ii) perpendicular to the line 3x-4y-1=0

Watch Video Solution

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

Watch Video Solution

5. The equation of the circle touching the lines y = x at a distance $\sqrt{2}$ units from the origin is .....

Watch Video Solution

6. A circle of radius d with both co-ordinates of its centre positive, touches the axis of x and the straight line 3y = 4x, Then its equation is .....

Watch Video Solution

Problem Set (3) (MULTIPLE CHOICE QUESTIONS)

1. The circle $x^2 + y^2 + 4x - 7y + 12 = 0$ cuts an intercept on y-axis equal to

A. 1

B. 3

C. 4

D. 7

Answer: A

Watch Video Solution

2. The intercepts made by the circle $x^2 + y^2 - 5x - 13y - 14 = 0$ on the x-axis and y-axis are respectively

A. 9, 13

B. 5, 13

C. 9, 15

D. none

Answer: C

Watch Video Solution

3. Equation of the circle through origin which cuts intercepts of lengths a and b on axes is

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

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

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

D. none of these

Answer: B

Watch Video Solution

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

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

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

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

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

Answer: C

Watch Video Solution

5. Show that the circle $x^2 + y^2 - 2ax - 2ay + a^2 = 0$ touches both the coordinate axes.

A. x-axis

B. y-axis

C. both axes

D. none

Answer: C

Watch Video Solution

6. The equation of circle through origin and cutting intercepts of lengths 2 and 3 from the positive sides of x and y axes is

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

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

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

D. none

Answer: C

Watch Video Solution

7. Equations of circle which touch y-axis at (0, 3) and intercepts a length of 8 units on the x-axis is

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

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

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

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

Answer: A::D

Watch Video Solution

8. Tangent to the parabola $y = x^2 + 6$ at (1, 7) touches the circle $x^2 + y^2 + 16x + 12y + c = 0$ at the point

A. (-6, -9)

B. (-13, -9)

C. (-6, -7)

D. (13, 7)

Answer: C

Watch Video Solution

9. Find the equation of a circle which touches $y - a\xi s$ at a distance of $4units$ from the origin and cutsan intercept of $6units$ along the positive direction of $x - a\xi s$.

A. $x^2 + y^2 + 10x - 8y + 10 = 0$

B. $x^2 + y^2 \pm 10x - 8y + 16 = 0$

C. $x^2 + y^2 + 10x \pm 8y + 16 = 0$

D. none

Answer: B

Watch Video Solution

10. The equation of the circle touching the axis of x at the origin and the line $4x - 3y + 24 = 0$ is

A. (0,12), 12

B. (0, -12), 12

C. (0,3), 3

D. (0, -3),3

Answer: B::C

Watch Video Solution

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

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

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

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

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

Answer: A

Watch Video Solution

12. The equation of the circle passing through (2, 1) and touching co-ordinate axes 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

Watch Video Solution

13. The equation of a circle passing through (3,6) touching both the axes is

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

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

C. $x^2 + y^2 + 30x - 30y + 225 = 0$

D. $x^2 + y^2 - 30x - 30y + 225 = 0$

Answer: A::D

Watch Video Solution

14. The equation of common tangent to the circles

$x^2y^2 + 14x - 4y + 28 = 0$

and $x^2 + y^2 - 14x + 4y - 28 = 0$ is

A. x = 7

B. y = 7

C. $7x - 2y + 14 = 0$

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

Answer: B

Watch Video Solution

15. The equations of the circles which touch both the axes and the line x = a are

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

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

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

D. none of these

Answer: C

Watch Video Solution

16. A circle of radius 5 units touches both the axes and lies in the first quadrant. If the circle makes one complete roll on x-axis along the positive direction of x-axis, then its equation in the new position is

A. $x^2 + y^2 + 20\pi x - 10y + 100\pi^2 = 0$

B. $x^2 + y^2 + 20\pi x + 10y + 100\pi^2 = 0$

C. $x^2 + y^2 - 20\pi x - 10y + 100\pi^2 = 0$

D. none of these

Answer: D

Watch Video Solution

17. The radius of a circle touching x-axis and having centre (2, 4) is

A. 2

B. 4

C. 6

D. none

Answer: B

Watch Video Solution

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

A. $g^2 = c$

B. $f^2 = c$

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

D. none

Answer: C

Watch Video Solution

19. The circle $x^2 + y^2 - 2x + c = 0$ touches y-axis, then c =

A. 1

B. 0

C. -1

D. none

Answer: B

Watch Video Solution

20. If the two straight 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. none

Answer: C

Watch Video Solution

21. Two circles $x^2 + y^2 = 6$ and $x^2 + y^2 - 6x + 8 = 0$ are given. Then the equation of the circle through their point of intersection and the point (1,1) is

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

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

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

D. none of these

Answer: B

Watch Video Solution

22. The equation of the circle passing through the intersection of the circles

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

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

and having its centre on the line y=x is

A. $3\left(x^2 + y^2\right) - 5x - 5y + 2 = 0$

B. $7\left(x^2 + y^2\right) - 10x - 10y - 12 = 0$

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

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

Answer: B

Watch Video Solution

23. 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

$x^2 + y^2 - 6x + 7 = 0$ $x^2 + y^2 - 3y + 4 = 0$ c.

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

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

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

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

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

Answer: A

Watch Video Solution

24. Equation of the circle touching the circle $x^2 + y^2 - 15x + 5y = 0$ at the point (1, 2) and passing through the point (0, 2) is

A. $13(x^2 + y^2) - 13x - 61y + 70 = 0$

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

C. $13(x^2 + y^2) - 13x - 61y + 9 = 0$

D. none

Answer: A

Watch Video Solution

25. The equation of the circle which passes through the origin and the points of intersection of the circle $x^2 + y^2 = 4$ and the line $x + y = 2$ is

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

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

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

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

Answer: B

Watch Video Solution

26. The circle passing through the intersection of circle $x^2 + y^2 - 3x - 6y + 8 = 0, x^2 + y^2 - 2x - 4y + 4 = 0$ and touchng 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: D

Watch Video Solution

27. If the two curves $ax^2 + 2hxy + by^2 + 2gx + 2fy + c = 0$ and $dx^2 + 2h'xy + b'y^2 + 2g'x$ intersect in four concylic points, then

A. $\frac{a-b}{h} = \frac{a'-b'}{h'}$

B. $\frac{a+b}{h} = \frac{d+b'}{h'}$

C. $h(a-b) = h'(a'+b')$

D. $h(a+b) = h'(a'-b')$

Answer: A

Watch Video Solution

28. One of the limit point of the coaxial system of circles containing $x^2+y^2-6x-6y+4=0, x^2+y^2-2x-4y+3=0$ is

A. (-1, 1)

B. (-1, 2)

C. (-2, 1)

D. (-2, 2)

Answer: A

Watch Video Solution

29. The four point of intersection of the lines $(2x - y + 1)(x - 2y + 3) = 0$ with the axes lie on a circle whose center centre is at the point :

A. $(3/4, 5/4)$

B. $(-7/4, 5/4)$

C. (2, 3)

D. none

Answer: B

Watch Video Solution

30. If the lines $a_1x + b_1y + c_1 = 0$ and $a_2x + b_2y + c_2 = 0$ cut the co-ordinate axes in concylic points, then

A. $a_1b_1 = a_2b_2$

B. $a_1 / a_2 = b_1 / b_2$

C. $a_1 + a_2 = b_1 + b_2$

D. $a_1 a_2 = b_1 b_2$

Answer: D

Watch Video Solution

31. If $\left(\frac{x}{a}\right) + \left(\frac{y}{b}\right) = 1$ and $\left(\frac{x}{c}\right) + \left(\frac{y}{d}\right) = 1$ intersect the axes at four concyclic points and $a^2 + c^2 = b^2 + d^2,$ then these lines can intersect at, $(a, b, c, d > 0)$ $(1, 1)$ (b) $(1, -1)$ $(2, -2)$ (d) $(3, 3)$

A. (1, 1)

B. (1, -1)

C. (2, -2)

D. (3, -2)

Answer: A::B::C

Watch Video Solution

32. If $\alpha, \beta, \gamma, \delta$ be four angles of a cyclic quadrilateral taken in clockwise direction then the value of $(2 + \Sigma \cos \alpha \cos \beta)$ will be:

A. $\sin^2 \alpha + \sin^2 \beta$

B. $\cos^2 \gamma + \cos^2 \delta$

C. $\sin^2 \alpha + \sin^2 \delta$

D. $\cos^2 \beta + \cos^2 \gamma$

Answer: A

Watch Video Solution

33. P, Q, R and S are the points of intersection with the co-ordinate axes of the lines ax+by = ab and bx + ay = ab then

A. P,Q,R,S are concyclic

B. P, Q, R, S form a parallelogram

C. P,Q,R,S form a rhombus

D. none of these

Answer: C

Watch Video Solution

34. If the equation of a given circle is $x^2 + y^2 = 36,$ then the length of the chord which lies along the line $3x + 4y - 15 = 0$ is $3\sqrt{6}$ 2. $2\sqrt{3}$ 3. $6\sqrt{3}$ 4. none of these

A. $3\sqrt{6}$

B. $2\sqrt{3}$

C. $6\sqrt{3}$

D. none of these

Answer: C

Watch Video Solution

35. The two lines through (2,3) from which the circle $x^2 + y^2 = 25$ intercepts chords of length 8 units have equations

A. $2x + 3y = 13, x + 5y = 17$

B. $y = 3, 12x + 5y = 39$

C. $x = 2, 9x - 11y = 51$

D. none of these

Answer: B

Watch Video Solution

36. The common chord of $x^2 + y^2 - 4x - 4y = 0$ 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

Watch Video Solution

37. The length of the common chord of the circles $(x-a)^2+(y-b)^2=c^2$ and $(x-b)^2+(y-a)^2=c^2$, is

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

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

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

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

Answer: B

Watch Video Solution

38. Let L_1 be a straight line passing through the origin and L_2 be the straight line $x + y = 1$. If the intercepts made by the circle $x^2 + y^2 - x + 3y = 0$ on L_1 and L_2 are equal, then which of the following equations can represent L_1?

A. $x + y = 0$

B. $x - y = 0$

C. $x + 7y = 0$

D. $x - 7y = 0$

Answer: B::C

Watch Video Solution

39. Length of common chord of the circles $x^2 + y^2 + ax + by + c = 0$ and $x^2 + y^2 + bx + ay + c = 0$ is

A. $\sqrt{\left[\frac{1}{2}(a-b)^2+4c\right]}$

B. $\sqrt{\left[\frac{1}{2}(a+b)^2-4c\right]}$

C. $\sqrt{\left[\frac{1}{2}(a-b)^2-4c\right]}$

D. $\sqrt{\left[\frac{1}{2}(a+b)^2+4c\right]}$

Answer: B

Watch Video Solution

40. The distance of the point (1, 2) from the common chord of the circles $x^2+y^2-2x+3y-5=0, x^2+y^2+10x+8y-1=0$ is

A. 1

B. 2

C. 3

D. none

Answer: B

Watch Video Solution

41. Radius of the circle with centre (3,1) and cutting a chord of length 6 on the line $2x + 5y + 18 = 0$ is

A. 6

B. 7

C. $\sqrt{38}$

D. $2\sqrt{5}$

Answer: C

Watch Video Solution

42. 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

Watch Video Solution

43. The intercept on the line y=x by the circle $x^2 + y^2 - 2x = 0$ is AB. Equation of the circle with 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

Watch Video Solution

44. Centre of a circle passing through point (0,1) and touching the curve $y = x^2$ at $(2, 4)$ is

A. $\left(\frac{-16}{5}, \frac{27}{10}\right)$

B. $\left(\frac{-16}{7}, \frac{5}{10}\right)$

C. $\left(\frac{-16}{5}, \frac{53}{10}\right)$

D. none of these

Answer: C

Watch Video Solution

45. A variable circle is described to pass through the point (a, 0) and touch the line $x + y = 0$. Locus of the centre of the above circle is

A. parabola

B. ellipse

C. hyperbola

D. none of these

Answer: A

Watch Video Solution

46. The equation of tangent drawn from origin to the circle $x^2 + y^2 - 2ax - 2by + b^2 = 0$ are perpendicular if

A. $a^2 = b^2$

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

C. $2a = b$

D. $2b = a$

Answer: A

Watch Video Solution

47. The equation of the circle passing through (2,0) and (0,4) and having the minimum radius is

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

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

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

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

Answer: C

Watch Video Solution

48. The length of the chord joining the points $(4\cos\alpha, 4\sin\alpha)$ and $\{4\cos(\alpha + 60^\circ), 4\sin(\alpha + 60^\circ)\}$ on the circle $x^2 + y^2 = 16$ is

A. 2

B. 3

C. 4

D. none

Answer: C

Watch Video Solution

49. The line $y = mx + c$ intersects the circle $x^2 + y^2 = a^2$ in two distinct real points if

A. $-a\sqrt{a + m^2} < c$

B. $c < a\sqrt{1 + m^2}$

C. $-c\sqrt{1 + m^2} < a$

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

Answer: A::B

Watch Video Solution

50. If a circle passes through the points of intersection of the co-ordinate axes with the lines $\lambda x - y + 1 = 0$ and $x - 2y + 3 = 0$, then the value of λ is

A. 2

B. $1/3$

C. 6

D. 3

Answer: A::B

Watch Video Solution

51. A circle cuts the circles $x^2 + y^2 = 4$

$x^2 + y^2 - 6x - 8y + 10 = 0$ and

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

at the ends of diameter. The co-ordinates of its centre are

A. (2,3)

B. (-2, -3)

C. (4, 6)

D. (-4, -6)

Answer: A

Watch Video Solution

52. Two parallel chords of a circle of radius 2 are at a distance $\sqrt{3}+1$ apart. If the chord subtend angles $\frac{\pi}{k}$ and $\frac{2\pi}{k}$ at the center, where $k>0$, then the value of [k] is ____

Watch Video Solution

53. 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 and 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: D

Watch Video Solution

Problem Set (3) (TRUE AND FALSE)

1. If the line $x\cos\alpha + y\sin\alpha = p$ cuts the circle $x^2 + y^2 = a^2$ in M and N, then the equation of the circle on MN as diameter is $x^2 + y^2 - a^2 = 2p(x\cos\alpha + y\sin\alpha - p)$

Watch Video Solution

2. The equation of the circle passing through (1, 1) and the points of intersection of the circles $x^2 + y^2 + 13x - 3y = 0$ and $2x^2 + 2y^2 + 4x - 7y - 25 = 0$ is $4x^2 + 4y^2 + 13x - 30y - 25 = 0$.

Watch Video Solution

3. The point (-a, - a) lies on the circle passing through the origin and the point of intersection of the straight line $x + y + a = 0$ with the circle $x^2 + y^2 = a^2$

Watch Video Solution

Problem Set (3) (FILL IN THE BLANKS)

1. Circle through the point M (5, 4) and touching x-axis at L (2,0) is .....

Watch Video Solution

2. The equation of circle of radius 5 in the first quadrant which touches x-axis and the line 4y = 3x is .....

Watch Video Solution

3. The equation of the circle inscribed in the triangle formed by line $x = 0, y = 0, 3x - 4y + 6 = 0$ is .....

Watch Video Solution

4. If the line $4x + 3y + \lambda = 0$ touches the circle $2x^2 + 2y^2 - 5x = 0$, then $\lambda =$ .....

Watch Video Solution

5. A circle lies completely in the third quadrant and touches both the axes, its radius is given to be 7. Its centre is .....

Watch Video Solution

Watch Video Solution

6. Centre of the circle which touches the lineş x = 0, y = 0 and $3x + 4y = 5$ is .....

Watch Video Solution

7. A circle cuts an intercept of length 12 units from the x-axis and its centre lies at the origin. Its equation is .....

Watch Video Solution

8. The equation of the circle which passes through the intersection of circle $x^2 + y^2 + 4(x + y) + 4 = 0$ with the line $x + y + 2 = 0$ and has its centre at the origin is .....

Watch Video Solution

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

Watch Video Solution

10. If the line $x-2y=\lambda$ cuts off a chord of length 2 from the circle $x^2+y^2=3$, then the value of $\lambda=$ .....

Watch Video Solution

11. The equation of the circle whose diameter is the common chord of the circles $(x-a)^2+y^2=a^2$ and $x^2+(y-b)^2=b^2$ is .....

Watch Video Solution

Problem Set (4) (MULTIPLE CHOICE QUESTIONS)

1. The locus of the centre of a circle of radius 2 which rolls on the outside of the circle $x^2 + y^2 + 3x - 6y - 9 = 0$ is

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

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

C. $x^2 + y^2 + 3x - 6y + 29/4 = 0$

D. None

Answer: B

Watch Video Solution

2. The locus of the centre of the circle which touches externally the circle $x^2 + y^2 - 6x - 6y + 14 = 0$ and also touches the x-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

Watch Video Solution

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

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

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

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

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

Answer: D

Watch Video Solution

4. The equation of the circle having the lines $x^2 + 2xy + 3x + 6y = 0$ as its normals and having size just suffcient to contain the circle $x(x-4) + y(y-3) = 0$ is

A. $x^2 + y^2 + 3x - 6y - 40 = 0$

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

C. $x^2 + y^2 + 8x + 4y - 20 = 0$

D. $x^2 + y^2 + 4x + 8y + 20 = 0$

Answer: B

Watch Video Solution

5. The circles $x^2 + y^2 - 6x - 2y + 9 = 0$ and $x^2 + y^2 = 18$ are such that they :

A. touch each other

B. intersect

C. one lies inside the other

D. none

Answer: C

Watch Video Solution

6. If the two circles $a\left(x^2+y^2\right)+bx+cy=0$ and $p\left(x^2+y^2\right)+qx+ry=0$ touch each other then

A. $a/p=b/q$

B. $b/q=c/r$

C. $a/p=c/r$

D. none

Answer: B

Watch Video Solution

7. Show that the circles $x^2 + y^2 - 10x + 4y - 20 = 0$ and $x^2 + y^2 + 14x - 6y + 22 = 0$ touch each other. Find the coordinates of the point of contact and the equation of the common tangent at the point of contact.

A. touch externally

B. intersect in real points

C. do not intersect

D. one is contained in the other

Answer: A

Watch Video Solution

8. The two circles $x^2 + y^2 - 5 = 0$ and $x^2 + y^2 - 2x - 4y - 15 = 0$

A. touch each other externally

B. touch each other internally

C. cut each other orthogonally

D. do not intersect

Answer: B

Watch Video Solution

9. Consider the circles $x^2 + (y-1)^2 = 9, (x-1)^2 + y^2 = 25$. They are such that these circles touch each other one of these circles lies entirely inside the other each of these circles lies outside the other they intersect at two points.

A. these circles touch each other

B. one of these circles lies entirely inside the other

C. each of these circles lies outside the other

D. they intersect in two points

Answer: B

Watch Video Solution

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

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

A. touch externally

B. touch internally

C. do not touch

D. none

Answer: B

Watch Video Solution

11. The circle $S_1(a_1, b_1), r_1$ touches externally the circles $S_2(a_2, b_2), r_2$. If the tangent at their common point passes through origin, then

A. $\left(a_1^2 + a_2^2\right) + \left(b_1^2 + b_2^2\right) = r_1^2 + r_2^2$

B. $(a_1^2 - a_2^2) + (b_1^2 - b_2^2) = r_1^2 - r_2^2$

C. $(a_1^2 - b_1^2) + (a_2^2 + b_2^2) = r_1^2 + r_2^2$

D. $(a_1^2 - b_1^2) - (a_2^2 + b_2^2) = r_1^2 - r_2^2$

Answer: B

Watch Video Solution

12. The circles $x^2 + y^2 - 4x + 6y + 8 = 0$ and $x^2 + y^2 - 10x - 6y + 14 = 0$

A. touch externally

B. touch internally

C. intersect

D. do not touch

Answer: A

Watch Video Solution

13. Equation of a circle with centre (4,3) touching the circle $x^2 + y^2 = 1$ is

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

B. $x^2 + y^2 - 8x - 6y + 11 = 0$

C. $x^2 + y^2 - 8x - 6y - 11 = 0$

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

Answer: C::D

Watch Video Solution

14. Centre of the circle whose radius is 3 and which touches internally the circle $x^2 + y^2 - 4x - 6y - 12 = 0$ at the point (-1 -1) is

A. $5x^2 + 5y^2 + 8x - 14y - 16 = 0$

B. $5x^2 + 5y^2 - 8x - 14y - 32 = 0$

C. $5x^2 + 5y^2 - 8x + 14y - 4 = 0$

D. $5x^2 + 5y^2 + 8x + 14y + 12 = 0$

Answer: B

Watch Video Solution

15. Equation of the circle touching the circle $x^2 + y^2 - 15x + 5y = 0$ at (1,2) and also passing through the point (0,2) is :

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

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

C. $13\left(x^2 + y^2\right) - 13x - 61y + 70 = 0$

D. none of these

Answer: C

Watch Video Solution

16. If the circles $(x-a)^2+(y-b)^2=c^2$ and $(x-b)^2+(y-a)^2=c^2$ touch each other, then

A. $a=b\pm 2c$

B. $a=b\pm\sqrt{2}c$

C. $a=b\pm c$

D. none of these

Answer: B

Watch Video Solution

17. The locus of centre of the circle which touches the circle $x^2+(y-1)^2=1$ externally and also touches x-axis is

A. $\left\{(x,y):x^2+(y-1)^2=4\right\}\cup\{(x,y):y<0\}$

B. $\left\{(x,y):x^2=4y\right\}\cup\{(0,y):y<0\}$

C. $\left\{(x,y):x^2=y\right\}\cup\{(0,y):y<0\}$

D. $\{(x, y) : x^2 = 4y\} \cup \{(x, y) : y > 0\}$

Answer: B

Watch Video Solution

18. The circle $x^2 + y^2 - 2ax + c^2 = 0$ and $x^2 + y^2 - 2by + c^2 = 0$ will touch each other externally if

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

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

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

D. none

Answer: A

Watch Video Solution

19. The circles $x^2 + y^2 + 2x - 2y + 1 = 0$ and $x^2 + y^2 - 2x - 2y + 1 = 0$ touch each other

A. touch externally

B. touch internally

C. intersect on y-axis

D. touch at (0, 1)

Answer: A::D

Watch Video Solution

20. Given the equation of two circles $x^2 + y^2 = r^2$ and $x^2 + y^2 - 10x + 16 = 0$. the value of r such that they intersect in real and distinct points is given by

A. $2 < r < 8$

B. $r = 2$ or $r = 8$

C. $r < 2$ or $r > 8$

D. none of these

Answer: A

Watch Video Solution

21. If the two circles $x^2 + y^2 = 4$ and $x^2 + y^2 - 24x - 10y + a^2 = 0, a \in I,$ have exactly two common tangents then the number of possible integral values of a is :

A. 0

B. 2

C. 11

D. 13

Answer: D

Watch Video Solution

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

A. $2<r<8$

B. r = 2

C. $r<2$

D. $r>2$

Answer: A

Watch Video Solution

23. The number of common tangents to the circles

$x^2+y^2+2x+8y-23=0$ and

$x^2+y^2-4x-10y+9=0$ are

A. 1

B. 2

C. 3

D. 4

Answer: B

Watch Video Solution

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

A. 2

B. 1

C. 4

D. 3

Answer: D

Watch Video Solution

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

A. 0

B. 1

C. 3

D. 4

Answer: B

Watch Video Solution

26. The number of common tangents of the circles $x^2 + y^2 = 16$ and $x^2 + y^2 - 2y = 0$ is :

A. 2

B. 3

C. 4

D. 0

Answer: D

Watch Video Solution

27. The common tangents to the circles $x^2 + y^2 + 2x = 0$ and $x^2 + y^2 - 6x = 0$ from a triangle which is :

A. equilateral

B. isosceles

C. right angled

D. none of these

Answer: A

Watch Video Solution

28. The locus of the centre of the circles which touch both the circles $x^2 + y^2 = a^2$ and $x^2 + y^2 = 4ax$ externally has the equation

A. $12(x-a)^2 - 4y^2 = 3a^2$

B. $9(x-a)^2 - 5y^2 = 2a^2$

C. $8x^2 - 3(y-a)^2 = 9a^2$

D. none of these

Answer: A

Watch Video Solution

29. 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. a circle

B. a parabola

C. an ellipse

D. a hyperbola

Answer: B

Watch Video Solution

Problem Set (4) (TRUE AND FALSE)

1. The circles $x^2 + y^2 - 10x + 4y - 20 = 0$ and $x^2 + y^2 + 14x - 6y + 22 = 0$ touch each other.

Watch Video Solution

2. Point of contact is $(10/13, 9/13)$.

View Text Solution

3. Find the distance between the line $12x - 5y + 15 - 0$ and the point $(4, 3)$.

Watch Video Solution

4. The circles $x^2 + y^2 - 10x + 4y - 20 = 0$ and $x^2 + y^2 + 14x - 6y + 22 = 0$ touch internally.

Watch Video Solution

Problem Set (4) (FILL IN THE BLANKS)

1. The circles $x^2 + y^2 + 2ax + c = 0$ and $x^2 + y^2 + 2by + c = 0$ touch each other if .....

Watch Video Solution

Problem Set (5) (MULTIPLE CHOICE QUESTIONS)

1. The locus of the mid-points of the chords of the circle $x^2 + y^2 + 4x - 6y - 12 = 0$ which subtend an angle of $\pi/3$ radians at its circumference is

A. $(x+2)^2 + (y-3)^2 = 6 \cdot 25$

B. $(x-2)^2 + (y+3)^2 = 6 \cdot 25$

C. $(x+2)^2 + (y-3)^2 = 18 \cdot 75$

D. $(x+2)^2 + (y+3)^2 = 18 \cdot 75$

Answer: A

Watch Video Solution

2. The equation of the locus of the mid-points of chords of the circle $4x^2 + 4y^2 - 12x + 4y + 1 = 0$ that substend an angle $\frac{2\pi}{3}$ at its centre, is

A. $4x^2 + 4y^2 - 12x + 4y + \frac{31}{4} = 0$

B. $4x^2 + 4y^2 - 12x + 4y + \frac{27}{4} = 0$

C. $4x^2 + 4y^2 - 12x + 4y + \frac{21}{4} = 0$

D. none

Answer: A

Watch Video Solution

3. The locus of the mid-point of the chords of the circle $x^2 + y^2 - 2x - 2y - 2 = 0$ which makes an angle of 120° at the centre is

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

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

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

D. none of these

Answer: A

Watch Video Solution

4. The locus of the mid-points of the chords of the circle $x^2 + y^2 - 2ax - 2by = 0$ which subtend a right angle at the centre is

A. $ax + by = 0$

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

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

D. none of these

Answer: D

Watch Video Solution

5. The locus of the midpoint of the 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

Watch Video Solution

6. Locus of the mid-points of the chords of the circle $x^2 + y^2 = a^2$ which are always at a constant distance from the centre is

A. parabola

B. ellipse

C. circle

D. none

Answer: C

Watch Video Solution

7. The coordinates of the middle point of the chord cut-off by $2x - 5y + 18 = 0$ by the circle $x^2 + y^2 - 6x + 2y - 54 = 0$ are $(1, 4)$ (b) $(2, 4)$ (c) $(4, 1)$ (d) $(1, 1)$

A. (1,4)

B. (2,4)

C. (4,1)

D. (1,1)

Answer: A

Watch Video Solution

8. A variable chord is drawn through the origin to the circle $x^2 + y^2 - 2ax = 0$. The locus of the centre of the circle drawn on this chord as diameter is

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

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

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

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

Answer: B

Watch Video Solution

9. Locus of the middle points of the chords of the circle $x^2 + y^2 - 2x - 6y - 10 = 0$, which passes through origin is

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

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

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

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

Answer: B

Watch Video Solution

10. If the circle $x^2 + y^2 + 2gx + 2fy + c = 0$ bisects the circumference of the circle $x^2 + y^2 + 2g'x + 2f'y + c' = 0$, then 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. $\sqrt{g'^2 + f'^2 + c'}$

Answer: B

Watch Video Solution

11. If two distinct chords, drawn from the point (p, q) on the circle $x^2 + y^2 = px + qy$ (where pq $\neq$ ~ 0) are bisected by the x-axis, then

A. $p^2 = q^2$

B. $p^2 = 8q^2$

C. $p^2 < 8q^2$

D. $p^2 > 8q^2$

Answer: D

Watch Video Solution

12. A chord of the circle $x^2 + y^2 = a^2$ passes through a fixed point (2,3).

The chord which is farthest from the centre is

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

B. $x - y + 1 = 0$

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

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

Answer: D

Watch Video Solution

13. The equation of the diameter of the circle $(x-2)^2+(y+1)^2=16$ which bisects the chord cut off by the circle on the line $x-2y-3=0$ is

A. $x+2y=0$

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

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

D. none

Answer: B

Watch Video Solution

14. The pole of the straight line $9x+y-28=0$ with respect to the circle $x^2+y^2-6x-8y+5=0$ is

A. (3, 1)

B. (1,3)

C. (3, -1)

D. none

Answer: D

Watch Video Solution

15. The pole of the line $3x + 4y - 45 = 0$ w.r.t. the circle $x^2 + y^2 - 6x - 8y + 5 = 0$ is

A. (3, 4)

B. (6, 8)

C. (4, 3)

D. none

Answer: B

Watch Video Solution

16. Polar of origin (0, 0) w.r.t. the circle $x^2 + y^2 + 2\lambda x + 2\mu y + c = 0$ touches the circle $x^2 + y^2 = r^2$ if

A. $c = r(\lambda^2 + \mu^2)$

B. $r = c(\lambda^2 + \mu^2)$

C. $c^2 = r^2(\lambda^2 + \mu^2)$

D. $r^2 = c^2(\lambda^2 + \mu^2)$

Answer: C

Watch Video Solution

17. The chords of contact of tangents from three points A,B,C to the circle $x^2 + y^2 = a^2$ are concurrent then the points A, B, C are

A. concyclic

B. collinear

C. vertices of a triangle

D. none

Answer: B

View Text Solution

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

A. A.P.

B. G.P.

C. H.P.

D. None

Answer: B

Watch Video Solution

19. If the tangents are drawn to the circle $x^2 + y^2 = 12$ at the point where it meets the circle $x^2 + y^2 - 5x + 3y - 2 = 0$, then the point of intersection of these tangents is

A. (6, -6)

B. $(6, 18/5)$

C. $(6, -18/5)$

D. none of these

Answer: C

Watch Video Solution

20. If O is the origin and OP, OQ are tangents to the circle $x^2 + y^2 + 2gx + 2fy + c = 0 (c \neq 0)$, then the equation of the circumcircle of the triangle OPQ is given by

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

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

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

D. none of these

Answer: C

Watch Video Solution

21. The distance between the chords of contact of the tangents to the circle $x^2 + y^2 + 2gx + 2fy + c = 0$ from the origin and the point (g,f) is

A. $g^2 + f^2$

B. $\frac{1}{2}(g^2 + f^2 + c)$

C. $\frac{1}{2}\frac{g^2 + f^2 + c}{\sqrt{(g^2 + f^2)}}$

D. $\frac{1}{2}\frac{g^2 + f^2 - c}{\sqrt{(g^2 + f^2)}}$

Answer: D

Watch Video Solution

22. The area of the triangle formed by the tangents from the point (4,3) to the circle $x^2 + y^2 = 9$ and the line joining their points of contact in sq. units is

A. $\frac{132}{25}$

B. $\frac{162}{25}$

C. $\frac{192}{25}$

D. none

Answer: C

Watch Video Solution

23. Tangents are drawn from the point (a, a) to the circle $x^2 + y^2 - 2x - 2y - 6 = 0$ If the angle between the tangents lies in the range $\left(\frac{\pi}{3}, \pi\right)$, then the exhaustive range of values of a is:

A. $(1, \infty)$

B. $(-5, -3) \cup (3, 5)$

C. $(-\infty, 2\sqrt{2}) \cup (2\sqrt{2}, \infty)$

D. $(-3, -1) \cup (3, 5)$

Answer: D

Watch Video Solution

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

A. $(1, 2)$

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

C. $(2, 4)$

D. none

Answer: B

Watch Video Solution

25. From the focus of the parabola $y^2 = 8x$, tangents are drawn to the circle $(x-6)^2 + y^2 = 4$. The equation of the circle through the focus and points of contact of the tangents is :

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

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

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

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

Answer: B

Watch Video Solution

26. The line $9x + y - 28 = 0$ is the chord of contact of the point $P(h, k)$ w.r.t. the circle $2x^2 + 2y^2 - 3x + 5y - 7 = 0$, then the point P is

A. (3,-1)

B. (3, 1)

C. (-3,1)

D. none

Answer: D

Watch Video Solution

27. Tangents drawn from the point P (1,8) to the circle $x^2 + y^2 - 6x - 4y - 11 = 0$ touch the circle at the points A and B. The equation of the circumcircle of the triangle PAB is

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

B. $x^2 + y^2 - 4x - 10y + 19 = 0$

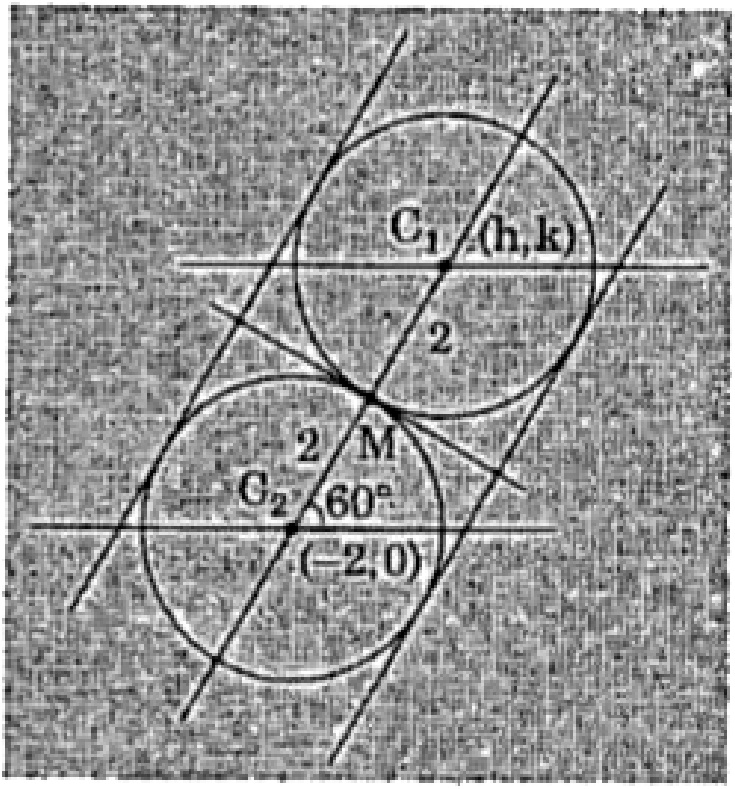
C. $x^2 + y^2 - 2x + 6y - 29 = 0$

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

Answer: B

Watch Video Solution

28. A circle C_1 of radius 2 units rolls outside the circle $C_2 = x^2 + y^2 + 4x = 0$ touching it externally. The line joining their centres makes an angle of 60° with x-axis.

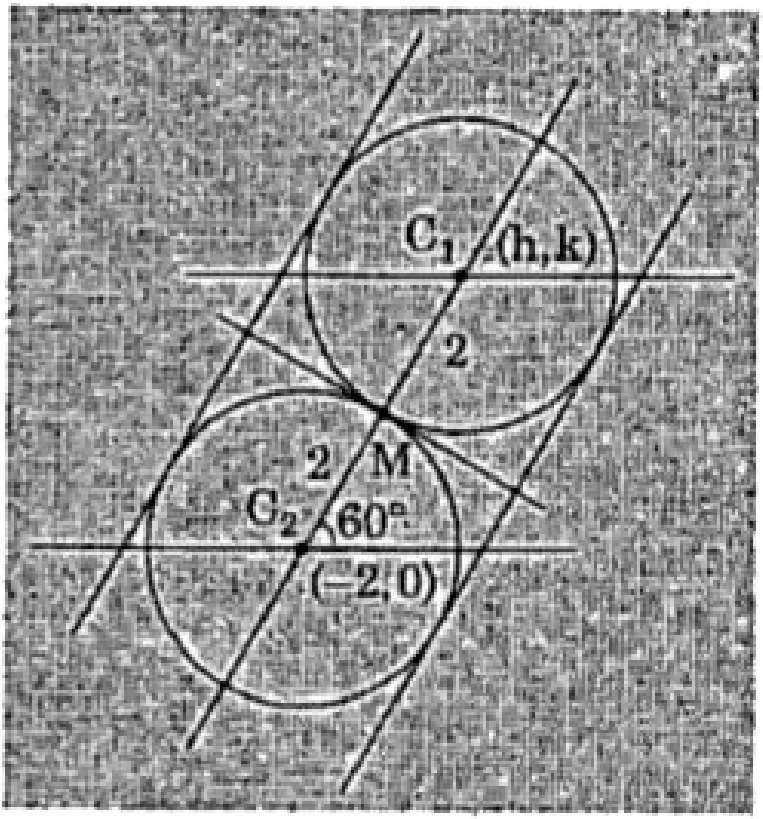


Answer following:

Locus of centre of outer circle C_1 is ...

Watch Video Solution

29. A circle C_1 of radius 2 units rolls outside the circle $C_2 = x^2 + y^2 + 4x = 0$ touching it externally. The line joining their centres makes an angle of 60° with x-axis.

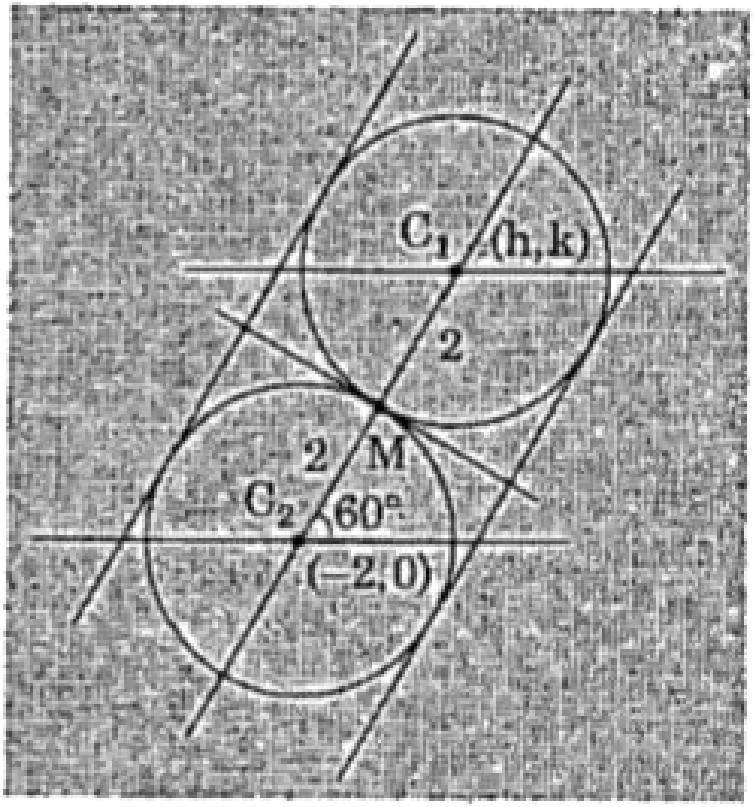


Answer following:

The point of contact of the two circles and the centre of outer circle is ...

Watch Video Solution

30. A circle C_1 of radius 2 units rolls outside the circle $C_2 = x^2 + y^2 + 4x = 0$ touching it externally. The line joining their centres makes an angle of 60° with x-axis.



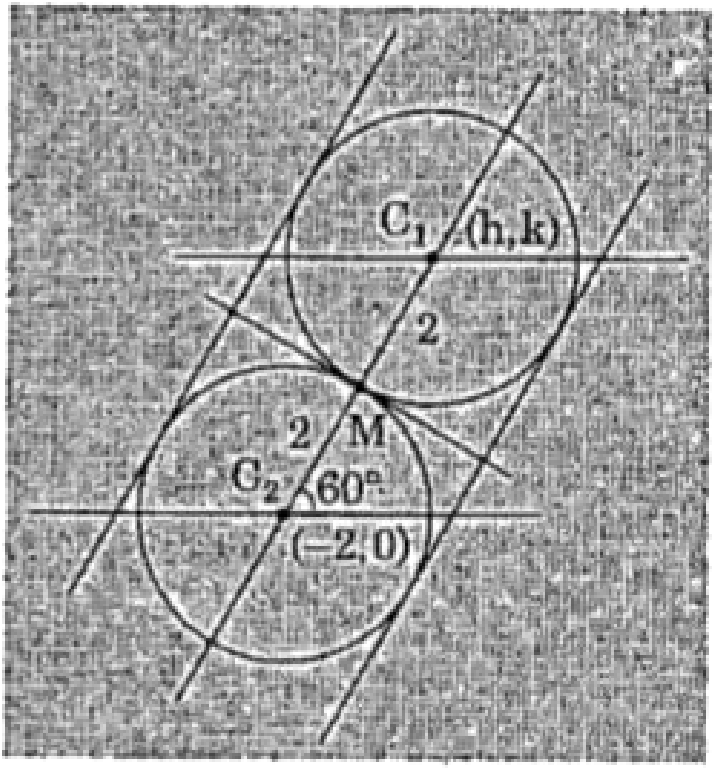
Answer following:

Number of common tangents between the two circles is ...

Watch Video Solution

31. A circle C_1 of radius 2 units rolls outside the circle $C_2 = x^2 + y^2 + 4x = 0$ touching it externally. The line joining their

centres makes an angle of 60° with x-axis.



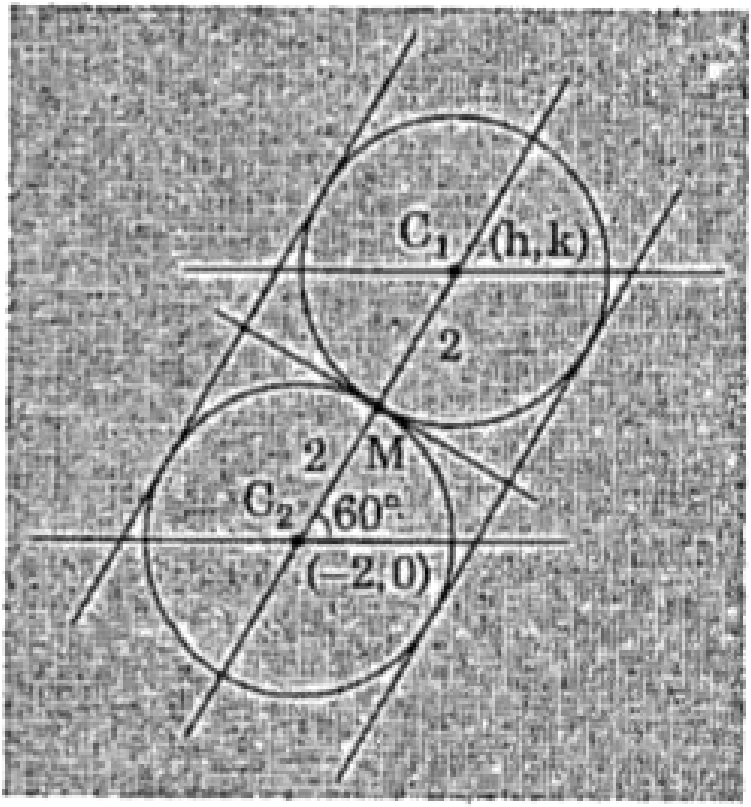
Answer following:

The equation of direct common tangents is ...

Watch Video Solution

32. A circle C_1 of radius 2 units rolls outside the circle $C_2 = x^2 + y^2 + 4x = 0$ touching it externally. The line joining their

centres makes an angle of 60° with x-axis.



Answer following:

The equation of transverse common tangent is ...

Watch Video Solution

Problem Set (5) (FILL IN THE BLANKS)

1. Locus of the middle points of the secants drawn through the point (x_1, y_1) and intercepted by the circle $x^2 + y^2 = a^2$ is .....

Watch Video Solution

2. Let $ax + by + c = 0$ be a given line. From points on this line tangents are drawn to $x^2 + y^2 = r^2$. Then the chord of contact of tangents passes through a point .....

Watch Video Solution

Problem Set (6) (MULTIPLE CHOICE QUESTIONS)

1. Given the circles $x^2 + y^2 - 4x - 5 = 0$ and $x^2 + y^2 + 6x - 2y + 6 = 0$.

Let P be a point (α, β) such that the tangents from P to both the circles are equal. Then

A. $2\alpha + 10\beta + 11 = 0$

B. $2\alpha - 10\beta + 11 = 0$

C. $10\alpha - 2\beta + 11 = 0$

D. $10\alpha + 2\beta + 11 = 0$

Answer: C

Watch Video Solution

2. The locus of a point which moves so that the tangents from it to the two circles $x^2 + y^2 - 5x - 3 = 0, 3x^2 + 3y^2 + 2x + 4y - 6 = 0$ are equal is.

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

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

C. $4x^2 + 4y^2 - 3x + 4y - 9 = 0$

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

Answer: B

Watch Video Solution

3. Radical axis of the circles $x^2 + y^2 + 6x - 2y - 9 = 0$ and $x^2 + y^2 - 2x + 9y - 11 = 0$ is :

A. $8x - 11y + 2 = 0$

B. $8x + 11y + 2 = 0$

C. $8x + 11y - 2 = 0$

D. $8x - 11y - 2 = 0$

Answer: B

Watch Video Solution

4. If the radical axis of the circles $x^2 + y^2 + 2gx + 2fy + c = 0$ and $2x^2 + 2y^2 + 3x + 8y + 2c = 0$

touches the circle $x^2 + y^2 + 2x + 2y + 1 = 0$, then

A. $g = 3/4$ and $f \neq 2$

B. $g \neq 3/4$ and $f = 2$

C. $g = 3/4$ or $f = 2$

D. none of these

Answer: C

Watch Video Solution

5. The equation of the line passing through the intersection of the circles $3x^2 + 3y^2 - 2x + 12y - 9 = 0$ and $x^2 + y^2 + 6x + 2y - 15 = 0$ is

A. $8x - 10y - 7 = 0$

B. $10x - 3y - 27 = 0$

C. $4x + 10y - 5 = 0$

D. none

Answer: B

Watch Video Solution

6. The equation $x^2 + y^2 + 2gx + c = 0$ where g is a parameter and c is a constant represents a family of coaxial circles any two members of which have the radical axis

A. x-axis

B. y-axis

C. x=const.

D. y=const.

Answer: B

Watch Video Solution

7. The distance of the point (1, 2) from the radical axis of the circles $x^2 + y^2 + 6x - 16 = 0$ and $x^2 + y^2 - 2x + 6y - 6 = 0$ is

A. $3/5$

B. $4/5$

C. $7/5$

D. none

Answer: C

Watch Video Solution

8. The co-ordinates of the point from which the lengths of tangents to the three circles $x^2 + y^2 = 1, x^2 + y^2 + 8x + 15 = 0, x^2 + y^2 + 10y + 24 = 0$ are equal is

A. (-2,1)

B. (1,-2)

C. (2,3)

D. $(-2, -5/2)$

Answer: D

Watch Video Solution

9. The co-ordinates of the point from which the length of tangents to the circles

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

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

and $2x^2 + 2y^2 - x + y - 1 = 0$ be equal is

A. $\left(\frac{10}{21}, \frac{14}{63}\right)$

B. (1, 0)

C. $\left(-\frac{10}{21}, -\frac{31}{63}\right)$

D. none

Answer: D

Watch Video Solution

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

A. orthocentre

B. circumcentre

C. incentre

D. centroid

Answer: A

Watch Video Solution

11. The radical centre of the circle $x^2 + y^2 = 1, x^2 + y^2 - 2x = 1$ and $x^2 + y^2 - 2y = 1$ is

A. (1, 1)

B. (2, 2)

C. (0, 0)

D. none

Answer: C

Watch Video Solution

12. Length of tangent from the radical centre of the three circles $x^2 + y^2 + 4x - 7 = 0, 2x^2 + 2y^2 + 3x + 5y - 9 = 0$ and $x^2 + y^2 + y = 0$ to the second circle is

A. 2

B. 3

C. 4

D. none

Answer: A

Watch Video Solution

13. Locus of the point from which the difference of the squares of lengths of tangents drawn to two given circles is constant is

A. circle

B. parabola

C. straight line

D. none

Answer: C

Watch Video Solution

14. The length of tangent from (5,1) to the circle $x^2 + y^2 + 6x - 4y - 3 = 0$ is

A. 81

B. 29

C. 7

D. 21

Answer: B

Watch Video Solution

15. $x^2 + y^2 + 2\lambda x + 5 = 0$ and $x^2 + y^2 + 2\lambda y + 5 = 0$ are the equations of two circles. P is any point on the line $x - y = 0$ from which the lengths of tangents to the two circles are t_1 and t_2. If $t_1 = 3$, then t_2 is

A. $3/2$

B. 3

C. 6

D. none

Answer: B

Watch Video Solution

16. If the tangent at the 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. 4

B. $2\sqrt{5}$

C. 5

D. $3\sqrt{5}$

Answer: C

Watch Video Solution

17. The lengths of the tangents from any point on the circle $15x^2 + 15y^2 - 48x + 64y = 0$ to the two circles $5x^2 + 5y^2 - 24x + 32y + 75 = 0$ and $5x^2 + 5y^2 - 48x + 64y + 300 = 0$ are in the ratio

A. $1:2$

B. $2:3$

C. $3:4$

D. none of these

Answer: A

Watch Video Solution

18. The length of the tangent drawn from any point on the circle $S = x^2 + y^2 + 2gx + 2fy + c = 0$ to the circle $S' = x^2 + y^2 + 2gx + 2fy + c' = 0$ where $c' > c$ is

A. $\sqrt{c+c'}$

B. $\sqrt{c-c'}$

C. $\sqrt{c'-c}$

D. none

Answer: C

Watch Video Solution

19. A and B are two points (0,0) and (3a,0) respectively. Points P and Q are taken on AB such that AP=PQ=QB. Circles are drawn on AP, PQ and QB as diameters. If T be the point from where the sum of the squares of the lengths of tangents to these three circles be b^2 then locus of the point T is

A. $x^2+y^2-5ax+6a^2-b^2=0$

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

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

D. $3\left(x^2+y^2\right)-9ax+8a^2-b^2=0$

Answer: D

Watch Video Solution

20. If the distances from the origin of the centres of the three circles $x^2+y^2-2\lambda ix=c^2(i=1,2,3)$ are in G.P., then the lengths of the tangents drawn to them from any point on the circle $x^2+y^2=c^2$ are in

A. A.P.

B. G.P.

C. H.P.

D. none of these

Answer: B

Watch Video Solution

21. A pair of tangents are drawn from a point P to the circle $x^2 + y^2 = 1$. If the tangents make an intercept of 2 on the line x=1, the locus of P is

A. straight line

B. pair of lines

C. circle

D. parabola

Answer: D

Watch Video Solution

22. A point P moves so that length of tangent from P to the circle $x^2 + y^2 - 2x - 4y + 1 = 0$ is three times the distance of P from (1, - 2). Locus of P is

A. straight line

B. circle

C. parabola

D. ellipse

Answer: B

Watch Video Solution

23. $x^2 + y^2 - 4x - 2y - 11 = 0$ is a circle to which tangents are drawn from the point (4, 5) which form a quadrilateral with a pair of radii. The area of this quadrilateral in sq. units is

A. 2

B. 4

C. 6

D. 8

Answer: D

Watch Video Solution

24. Equation of the circle coaxial with the circles $2x^2 + 2y^2 - 2x + 6y - 3 = 0$ and $x^2 + y^2 + 4x + 2y + 1 = 0$ it being known that its centre lies on the radical axis of the given circles is

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

B. $3x^2 + 3y^2 + 7x + 8y - 3 = 0$

C. $4x^2 + 4y^2 + 6x + 10y - 1 = 0$

D. none

Answer: C

Watch Video Solution

25. ABCD is a square of side length 2. C_1 is a circle inscribed in the square and C_2 is a circle. circumscribing the square. P and Q are any two points on C_1 and C_2 respectively. Also R is fixed point and L is a fixed line in the same plane. A circle C touches line L and circle C_1 externally. S is a point

which is equidistant from given point Rand fixed line L. Point R coincides with B.

$$\frac{PA^2+PB^2+PC^2+PD^2}{QA^2+QB^2+QC^2+QD^2}=$$

A. 1

B. 1.75

C. $.75$

D. 1.5

Answer: C

View Text Solution

26. ABCD is a square of side length 2. C_1 is a circle inscribed in the square and C_2 is a circle. circumscribing the square. P and Q are any two points on C_1 and C_2 respectively. Also R is fixed point and L is a fixed line in the same plane. A circle C touches line L and circle C_1 externally. S is a point which is equidistant from given point Rand fixed line L. Point R coincides with B.

Let L be the line joining any two adjacent points of the square. The locus of centre of this circle C is :

A. parabola

B. ellipse

C. pair of straight lines

D. hyperbola

Answer: A

View Text Solution

27. ABCD is a square of side length 2. C_1 is a circle inscribed in the square and C_2 is a circle. circumscribing the square. P and Q are any two points on C_1 and C_2 respectively. Also R is fixed point and L is a fixed line in the same plane. A circle C touches line L and circle C_1 externally. S is a point which is equidistant from given point Rand fixed line L. Point R coincides with B.

Line Lpasses through A and Cand a line parallel to AC passes through B. If

the locus of S cuts this line at 2 points T_1 and T_2 and the diagonal BD at T_3, the area of triangle $T_1T_2T_3$ is :

A. 1 sq. unit

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

C. 2 sq. units

D. 3 sq. units

Answer: A

View Text Solution

Problem Set (6) (TRUE AND FALSE)

1. The line $Ax + By + C = 0$, cuts the circle $x^2 + y^2 + ax + by + c = 0$ in P and Q and the line $A'x + B'y + C' = 0$ cuts the circle $x^2 + y^2 + dx + b'y + c' = 0$ in R and S. If the four points P,Q,R,S are

concyclic, then

$$D = \begin{vmatrix} a-a' & b-b' & c-c' \\ A & B & C \\ A' & B' & C' \end{vmatrix} = 0$$

Watch Video Solution

Problem Set (7) (MULTIPLE CHOICE QUESTIONS)

1. The equation of the circle orthogonal to both the circles $x^2+y^2+3x-5y+6=0$ and $4x^2+4y^2-28x+29=0$ and whose centre lies on $3x+4y+1=0$ is

A. $x^2+y^2+\frac{1}{2}y-\frac{29}{4}=0$

B. $x^2+y^2+\frac{3}{2}x+\frac{5}{4}=0$

C. $x^2+y^2+\frac{7}{2}x+\frac{3}{2}y+5=0$

D. none

Answer: A

Watch Video Solution

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

A. $x^2 + y^2 + 16x + 12y + 2 = 0$

B. $x^2 + y^2 - 16x - 12y - 2 = 0$

C. $3\left(x^2 + y^2\right) - 14x + 23y - 15 = 0$

D. none

Answer: C

Watch Video Solution

3. Equation of the circle cutting orthogonally the three circles $x^2 + y^2 - 2x + 3y - 7 = 0, x^2 + y^2 + 5x - 5y + 9 = 0$ and $x^2 + y^2 + 7x$ is

A. $x^2 + y^2 - 16x - 18y - 4 = 0$

B. $x^2 + y^2 - 7x + 11y + 6 = 0$

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

D. none of these

Answer: A

Watch Video Solution

4. A circle passes through the 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

Watch Video Solution

5. Let $px + qy + r = 0$ where p, q, r are in A.P. be normal to the family of circles. The equation of the circle of the family which intersects the circle $x^2 + y^2 - 4x - 4y - 1 = 0$ orthogonally is :

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

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

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

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

Answer: A

Watch Video Solution

6. The two circles $x^2 + y^2 - 25 = 0$, and $x^2 + y^2 - 26y + 25 = 0$ are such that they

A. touch

B. cut orthogonally

C. one is inside the other

D. none

Answer: B

Watch Video Solution

7. 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. $2 \text{ or } -\frac{3}{2}$

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

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

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

Answer: A

Watch Video Solution

8. The circle $x^2 + y^2 + 4x + 6y - 8 = 0$ and $x^2 + y^2 + 6x - 8y + c = 0$ cut orthogonally if c=

A. 4

B. -4

C. 3

D. -3

Answer: B

Watch Video Solution

9. If the circles of same radius a and centers at (2, 3) and 5, 6) cut orthogonally, then find a.

A. 3

B. 2

C. 1

D. 0

Answer: A

Watch Video Solution

10. (iii)If two circles cut a third circle orthogonally; then the radical axis of two circle will pass through the center of the third circle .

A. 1st circle

B. 2nd circle

C. 3rd circle

D. none

Answer: C

Watch Video Solution

11. The centre of the circle S=0 lies on the line 2x-2y+9=0 and it cuts the circle $x^2 + y^2 = 4$ orthogonally . Show that S=0 passes through two fixed points and find their coordinates.

A. (1, 1), (3, 3)

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

C. (0, 0), (5, 5)

D. none

Answer: B

Watch Video Solution

12. Equation of the circle which passes through origin and whose centre lies on the line $x + y = 4$ and cuts the circle $x^2 + y^2 - 4x + 2y + 4 = 0$ orthogonally is

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

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

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

D. none

Answer: B

Watch Video Solution

13. The circles $x^2 + y^2 + x + y = 0$ and $x^2 + y^2 + x - y = 0$ intersect at an angle of

A. $\pi/6$

B. $\pi/4$

C. $\pi/3$

D. $\pi/2$

Answer: D

Watch Video Solution

14. The locus of the centre of the circle which cuts the circles $x^2 + y^2 + 2g_1x + 2f_1y + c_1 = 0$ and $x^2 + y^2 2g_2x + 2f_2y + c_2 = 0$ orthogonally is

A. an ellipse

B. the radical axis of the giverr circles

C. a conic

D. another circle

Answer: B

Watch Video Solution

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

A. $y^2 = 16x$

B. $x^2 = 16y$

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

D. $x^2 = 16y + 4$

Answer: A

Watch Video Solution

16. If a circle passes through the point (1, 2) and cuts the circle $x^2 + y^2 = 4$ orthogonally then the locus of its centre is

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

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

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

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

Answer: A

Watch Video Solution

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

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

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

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

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

Answer: B

View Text Solution

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

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

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

C. $x^2 + y^2 - 3ax - 4by + \left(a^2 + b^2 - p^2\right) = 0$

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

Answer: B

Watch Video Solution

19. x=1 is the radical axis of two of the circles which intersect orthogonally. If the equation of one of the circles is $x^2 + y^2 = 4$, then the equation of the other circle is

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

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

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

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

Answer: B

View Text Solution

20. The centre of the circle which intersects the three circles, $x^2 + y^2 + 4x + 7 = 0$, $x^2 + y^2 + y = 0$ and $2x^2 + 2y^2 + 3x + 5y + 9 = 0$ orthogonally is the point

A. (2, 1)

B. (-2, 1)

C. (2, -1)

D. (-2, -1)

Answer: D

Watch Video Solution

21. If the chord of contact of tangents from a point P to a given circle passes through Q, then the circle on PQ as diameter. cuts the given circle orthogonally touches the given circle externally touches the given circle internally none of these

A. touches the given circle internally

B. touches the given circle externally

C. cuts the given circle orthogonally

D. none

Answer: C

Watch Video Solution

22. The circles having radii $r_1 and r_2$ intersect orthogonally. The length of their common chord is $\frac{2r_1r_2}{\sqrt{r12+r12}}$ (b) $\frac{\sqrt{r12+r12}}{2r_1r_2}$ $\frac{r_1r_2}{\sqrt{r12+r12}}$ (d) $\frac{\sqrt{r12+r12}}{r_1r_2}$

A. $\frac{2r_1r_2}{\sqrt{r_1^2+r_2^2}}$

B. $\frac{r_1r_2}{\sqrt{r_1^2+r_2^2}}$

C. $\frac{2r_1^2r_2}{\sqrt{r_1^2+r_2^2}}$

D. $\frac{2r_2^2r_1}{\sqrt{r_1^2+r_2^2}}$

Answer: A

Watch Video Solution

23. The value of k so that $x^2+y^2+kx+4y+2=0$ and $2\left(x^2+y^2\right)-4x-3y+k=0$ cut orthogonally, is

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

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

C. $\frac{-10}{3}$

D. 1

Answer: C

Watch Video Solution

Problem Set (7) (TRUE AND FALSE)

1. The lengths of tangents from a fixed point to three circles of coaxial system are t_1, t_2, t_3 and if P, Q, R be the centres, then $QRt_1^2 + RPt_2^2 + PQt_3^2 = 0.$

Watch Video Solution

2. P, Q, R are the centres and r_1, r_2, r_3 are the radii respectively of three coaxial circles, then

$QRr_1^2 + RPr_2^2 + PQr_3^2 = PQ.\, QR.\, RP$

Watch Video Solution

3. Two circles $x^2+y^2+2g_1x+2f_1y+c_1=0$ and $x^2+y^2+2g_2x+2f_2y+c_2=0$ intersect at an angle of 120° then $(2g_1g_2+2f_1f_2-c_1-c_2)^2=(g_1^2+f_1^2-c_1)(g_2^2+f_2^2-c_2)$.

is this statement true or false?

Watch Video Solution

Problem Set (7) (FILL IN THE BLANKS)

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

Watch Video Solution

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

Watch Video Solution

MISCELLANEOUS EXERCISE (MATCHING ENTRIES)

1.

List-I (Equation of Circles)	List-II (Equations)
(a) OAB where O is origin and $A(3,0)$ and $B(0,5)$	(i) $x^2+y^2-4x-6y+11=0$
(b) $P(3,4)$, $Q(1,2)$ is diameter	(ii) $x^2+y^2-4x-4y-5=0$
(c) Touches x-axis at $(3,0)$ and makes an intercept of 8 on y-axis.	(iii) $x^2+y^2-3x-5y=0$
(d) Passes through $(4,5)$ and centre is $(2,2)$	(iv) $x^2+y^2-6x\pm10y+9=0$

View Text Solution

2.

List-I (Lines)	List-II (Equations)
(a) Tangent to $x^2+y^2-6x+4y-12=0$ which is parallel to $4x+3y+5=0$	(i) $2x+3y-13=0$
(b) Common chord of the circles $x^2+y^2-6x+2y+4=0$ and $x^2+y^2-10x-12y+40=0$	(ii) $4x+3y+19=0$ $4x+3y-31=0$
(c) Chord of the circle $x^2+y^2=25$ whose mid-point is $(2,3)$	(iii) $3x+2y=13$
(d) Tangent at $(3,2)$ to the circle $x^2+y^2+6x+4y-39=0$	(iv) $4x+7y-18=0$

View Text Solution

3.

List-I (Length)	List-II
(a) Length of common chord of the circles $x^2+y^2+4x-6y-4=0$ and $x^2+y^2-x+6y+2=0$	(i) 15
(b) Length of the tangent drawn from $(16,7)$ to circle $x^2+y^2-2x-4y-20=0$	(ii) 6
(c) Length of intercept on x-axis by the circle $x^2+y^2+10x-6y+9=0$	(iii) 2
(d) Length of intercept on the line $2x-5y+18=0$ by the circle $x^2+y^2-6x+2y-26=0$	(iv) 8

View Text Solution

4.

List-I (Locus)	List-II (Equations)
(a) Locus of the point of intersection of two mutually ⊥ tangents to circle $x^2 + y^2 = a^2$	(i) $(x-2)^2 + (y-1)^2 = 16$
(b) Locus of the point $(2 + 4\cos\theta, -1 + 4\sin\theta)$	(ii) $x^2 + y^2 - xx_1 - yy_1 = 0$
(c) Locus of a point s.t. ratio of its distance from two given points is constant k	(iii) $x^2 + y^2 = 2a^2$
(d) Locus of the mid-points of the chords of the circle $x^2 + y^2 = a^2$ which passes through (x_1, y_1) where $2a$ is distance along given points.	(iv) $x^2 + y^2 - 2ax\frac{(1+k^2)}{1-k^2} + a^2 = 0$

View Text Solution

5.

List-I	List-II
(a) Tangent to $(x-2)^2 + (y+1)^2 = 1$	(i) $8x + 7y + 5$
(b) Chord of contact of point $(6, 4)$ w.r.t. $x^2 + y^2 + 4x + 6y - 19 = 0$	(ii) $3x + 4y - 2$
(c) Diameter of circle given in (a)	(iii) $x^2 + y^2 - cx \pm cy + \frac{c^2}{4}$
(d) Circle touching both axes and the line $x = c$	(iv) $y = 0$

View Text Solution

List-I	List-II
(a) If a circle passes through the points (5, 2) and (7, – 4) and its centre lies on y-axis, then its radius is ...	1. $x^2 + y^2 - 4x - 3y = 0$
(b) Two diameters of a circle passing through the point (6, 2) are $x + y = 0$ and $x + 2y = 4$, then its radius is ...	2. (16, 13), (– 4, – 11)
(c) The line $3x + 4y = 12$ meets the axes in the points A and B, and O is origin then the circle OAB is ...	3. $\pi / 3$
(d) The centres of the two equal circles of radius 13 units and having a common tangent at the point (1, 1) are ...	4. $2\sqrt{5}$
(e) The equation $x^2 + y^2 + 4x + 6y + 13 = 0$ represents ...	5. Point (– 2, – 3)
(f) The angle at which the circle $x^2 + y^2 = 16$ is seen from the point (8, 0) is ...	6. $2\sqrt{5}$

6.

View Text Solution

List-I	List-II
(a) The slopes of the tangents drawn to the circle $x^2 + y^2 - 2x - 4y - 4 = 0$ from the point (1, 7) are ...	1. $7(x^2 + y^2) - 10x - 10y - 12 = 0$
(b) Equation of a circle which cuts an intercept of length 8 units on x-axis and touches y-axis at (0, 3) is ...	2. 3
(c) The equation of the circle passing through the intersection of the circles $x^2 + y^2 - 6x + 2y + 4 = 0$, $x^2 + y^2 + 2x - 4y - 6 = 0$ and having its centre on the line $y = x$ is	3. $\pm\frac{4}{3}$
(d) 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 ...	4. $x^2 + y^2 \pm 10x - 6y + 9 = 0$
(e) If the circles $x^2 + y^2 - 2ax + c^2 = 0$ and $x^2 + y^2 - 2by + c^2 = 0$ touch each other externally, then the required condition is ...	5. $x^2 + y^2 + x + y = 0$
(f) If the circles of same radius a and centres at (2, 3) and (5, 6) cut orthogonally then a = ...	6. $\frac{1}{a^2} + \frac{1}{b^2} = \frac{1}{c^2}$

7.

View Text Solution

8. Consider the circle $S = x^2 + y^2 + 4x + 6y - 19 = 0$ and the point P(6, 4) outside the circle

List-I	List-II
(a) Distance of P from centre of the circle	(p) $\frac{72\sqrt{226}}{113}$
(b) Length of tangent from P to the circle	(q) 9
(c) Length of chord of contact of P to the circle	(r) $\sqrt{113}-\sqrt{32}$
(d) Shortest distance of P from the circle	(s) $\sqrt{113}$

Watch Video Solution

9.

List-I	List-II
(a) The circles $x^2+y^2+2x+3y+c^2=0$ and $x^2+y^2-x+2y+c^2=0$ intersect orthogonally	(p) $c=1$
(b) The circle $x^2+y^2=9$ contains the circle $x^2+y^2-2x+1-c^2=0$	(q) $c=-1$
(c) The circle $x^2+y^2=9$ is contained in the circle $x^2+y^2-6x-8y+25-c^2=0$	(r) $c=\frac{1}{2}$
(d) The circle $x^2+y^2+2x+c=0$ and $x^2+y^2+2y+c=0$ touch each other	(s) $c>8$

View Text Solution

10. The circle $x^2+y^2-14x-10y+24=0$ makes an

List-I	List-II
(a) intercept on x-axis	$(p)0$
(b) intercept on y-axis	$(q)2$
(c) intercept on $y=x$	$(r)8\sqrt{3}$
(d) intercept on $7x+y-4=0$	$(s)10$

Watch Video Solution

Assertion/Reason

1. Tangents are drawn from the point (17,7) to the circle $x^2 + y^2 = 169$.

STATEMENT-1 : The tangents are mutually perpendicular.

because

STATEMENT-2 : The locus of the points from which mutually perpendicular tangents can be drawn to the given circle is $x^2 + y^2 = 338$.

View Text Solution

2. Consider, $L_1 : 2x + 3y + p - 3 = 0$, $L_2 : 2x + 3y + p + 3 = 0$, where p is a real number, and $C : x^2 + y^2 + 6x - 10y + 30 = 0$

Statement-I : If line L_1 is a chord of circle C, then line L_2 is not always a diameter of circle C.

and

Statement-II : If line L_1 is a diameter of circle C, then line L_2 is not a chord of circle C.

Watch Video Solution

COMPREHENSION (Passage)

1. Consider the equation of circle $x^2 + y^2 - 2x - 2\lambda y - 8 = 0$ where λ is variable then answer the following:

The given equation represents a family of circles passing through two fixed points. Find the coordinates of the fixed points.

Watch Video Solution

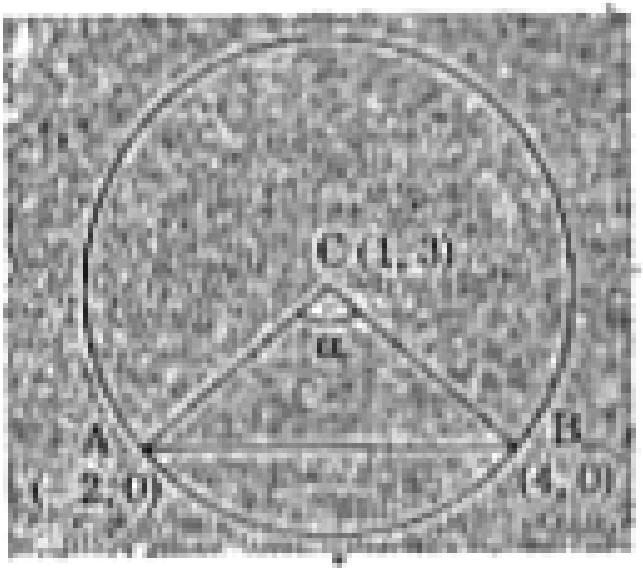
2. Consider the equation of circle $x^2 + y^2 - 2x - 2\lambda y - 8 = 0$ where λ is variable then answer the following:

Find the equation of a circle of this family tangents to which at these fixed points A and B of part (a) meet on the line $x + 2y + 5 = 0$

Watch Video Solution

3. Consider the equation of circle $x^2 + y^2 - 2x - 2\lambda y - 8 = 0$ where λ is variable then answer the following:

If the chord joining the fixed points subtends an angle α at the centre of the circle, then $\alpha = \pi/2$



Watch Video Solution

4. A tangent PT is drawn to the circle $x^2 + y^2 = 4$ at the point P $\left(\sqrt{3}, 1\right)$. A straight line L, perpendicular to PT is a tangent to the circle

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

a common tangent of the two circles is

A. $x=4$

B. $y=2$

C. $x-\sqrt{3}y=5$

D. $x+2\sqrt{2}y=6$

Answer: D

Watch Video Solution

5. A possible equation of L is (A) x 3y 1 (B) x 3y 1 (C) x 3y 1 (D) x 3y 5

A. $x-\sqrt{3y}=1$

B. $x+\sqrt{3}y=1$

C. $x-\sqrt{3}y=-1$

D. $x+\sqrt{3}y=5$

Answer: A

Watch Video Solution

6. A circle of radius 1 is inscribed in an equilateral triangle PQR. The points of contact of C with the sides PQ, QH and RP are D, E, F, respectively. The line PQ is given by the equation $\sqrt{3}x + y - 6 = 0$ and the point D is $\left(\frac{3\sqrt{3}}{2}, \frac{3}{2}\right)$. Further, it is given that the origin and the centre of C are on the same side of the line PQ.

The equation of circle C is

A. $\left(x + 2\sqrt{3}\right)^2 + (y+1)^2 = 1$

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

C. $\left(x - \sqrt{3}\right)^2 + (y+1)^2 = 1$

D. $\left(x - \sqrt{3}\right)^2 + (y-1)^2 = 1$

Answer: D

Watch Video Solution

7. A circle of radius 1 is inscribed in an equilateral triangle PQR. The points of contact of C with the sides PQ, QH and RP are D, E, F, respectively. The line PQ is given by the equation $\sqrt{3}x + y - 6 = 0$ and the point D is $\left(\frac{3\sqrt{3}}{2}, \frac{3}{2}\right)$. Further, it is given that the origin and the centre of C are on the same side of the line PQ.

Points E andF are given by

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

B. $\left(\frac{\sqrt{3}}{2}, \frac{1}{2}\right), (\sqrt{3}, 0)$

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

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

Answer: A

View Text Solution

8. A circle of radius 1 is inscribed in an equilateral triangle PQR. The points of contact of C with the sides PQ, QH and RP are D, E, F, respectively. The line PQ is given by the equation $\sqrt{3}x + y - 6 = 0$ and the point D is $\left(\frac{3\sqrt{3}}{2}, \frac{3}{2}\right)$. Further, it is given that the origin and the centre of C are on the same side of the line PQ.

Equations of the sides QR, RP are

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

B. $y = \frac{1}{\sqrt{3}}x, y = 0$

C. $y = \frac{\sqrt{3}}{2}x + 1, y = -\frac{\sqrt{3}}{2}x - 1$

D. $y = \sqrt{3}x, y = 0$

Answer: D

View Text Solution

9. Let ABCD be a square of side length 2 units. C2 is the circle through vertices A, B, C, D and C1 is the circle touching all the sides of the square

ABCD. L is a line through A. 27. If P is a point on C1 and Q in another point on C2, then 2222 2222 PA PB PC PD QA QB QC QD +++ +++ is equal to (A) 0.75 (B) 1.25 (C) 1 (D) 0.5

A. 0.75

B. 1.25

C. 1

D. 0.5

Answer: A

Watch Video Solution

10. Let ABCD be a square of side length 2 units. C_2 is the fircle through the vertices A, B, C, D and C_1 is the circle touching all the of the square ABCD. L is a lien through vertex A. A circle touches the line L and the circle C_1 externally such that both the circles are on the same side of the line L. The locus of the centre of the circle is

A. ellipse

B. hyperbola

C. parabola

D. pair of straight lines

Answer: C

Watch Video Solution

11. Let ABCD be a square of side length 2 units. C_2 is the circle through vertices A, B, C, D and C_1 is the circle touching all the sides of the square ABCD. L is a line through A

A line M through A is drawn parallel to BD. Point S moves such that its distances from the line BD and the vertex A are equal. If locus of S cuts. M at T_2 and T_3 and AC at T_1, then area of $\Delta T_1 T_2 T_3$ is

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

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

C. 1 sq. unit

D. 2 sq. unit

Answer: C

Watch Video Solution

Self Assessment Test

1. The locus of the centre of a circle of radius 2 which rolls on the outside of the circle $x^2 + y^2 + 3x - 6y - 9 = 0$ is

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

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

C. $x^2 + y^2 + 3x - 6y + 29/4 = 0$

D. none

Answer: B

Watch Video Solution

2. Two circles $x^2 + y^2 = 6$ and $x^2 + y^2 - 6x + 8 = 0$ are given. Then the equation of the circle through their point of intersection and the point (1,1) is

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

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

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

D. None of these

Answer: B

Watch Video Solution

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

A. 5π

B. 10π

C. 25π

D. None of these

Answer: C

Watch Video Solution

4. Given the circles $x^2 + y^2 - 4x - 5 = 0$ and $x^2 + y^2 + 6x - 2y + 6 = 0$

Let P be a point (α, β) such that the tangents from P to both the circles are equal. Then

A. $2\alpha + 10\beta + 11 = 0$

B. $2\alpha - 10\beta + 11 = 0$

C. $10\alpha - 2\beta + 11 = 0$

D. $10\alpha + 2\beta + 11 = 0$

Answer: C

Watch Video Solution

5. The length of tangent from (5,1) to the circle $x^2 + y^2 + 6x - 4y - 3 = 0$ is

A. 81

B. 29

C. 7

D. 21

Answer: C

Watch Video Solution

6. If the equation $ax^2 + by^2 + 2hxy + 2gx + 2fy + c = 0$ represents a circle, the condition will be

A. a=b and c=0

B. f=g and h=0

C. a=b and h=0

D. f=g and c=0

Answer: C

Watch Video Solution

7. The two circle $x^2 + y^2 = r^2$ and $x^2 + y^2 - 10x + 16 = 0$ intersect at two distinct points . Then which one of the following is correct ?

A. $2 < r < 8$

B. $r = 2 \text{ or } r = 8$

C. $r < 2 \text{ or } r > 8$

D. None of the above

Answer: A

Watch Video Solution

8. 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 intersect each other

C. one lies inside the other

D. each lies outside the other

Answer: B

Watch Video Solution

9. Equation of a circle passing through origin is $x^2 + y^2 - 6x + 2y = 0$. What is the equation of one of its diameter ?

A. $x + 3y = 0$

B. $x + y = 0$

C. $x = y$

D. $3x + y = 0$

Answer: A

Watch Video Solution

10. The circle $x^2 + y^2 + 4x - 7y + 12 = 0$ cuts an intercept on y-axis equal to

A. 1

B. 3

C. 4

D. 7

Answer: A

Watch Video Solution

11. AB is a diameter of a circle and C is any point on the circumference of the circle. Then

A. the area of ΔABC is maximum when it is isosceles.

B. the area of ΔABC is minimum when it is isosceles.

C. the perimeter of ΔABC is maximum when it is isosceles.

D. none of these

Answer: A

Watch Video Solution

12. Centre of a circle passing through point (0,1) and touching the curve $y = x^2$ at $(2, 4)$ is

A. $\left(\frac{-16}{5}, \frac{27}{10}\right)$

B. $\left(\frac{-16}{7}, \frac{5}{10}\right)$

C. $\left(\frac{-16}{5}, \frac{53}{10}\right)$

D. None of these

Answer: C

Watch Video Solution

13. The locus of the mid-points 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

Watch Video Solution

14. What is slope?

A. (3, 1)

B. (1, 3)

C. (3, -1)

D. (-3, 1)

Answer: C

Watch Video Solution

15. The equation of the circle passing through (4,5) having the centre at (2,2) is

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

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

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

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

Answer: B

Watch Video Solution

16. The equation of tangents drawn from the origin to the circle $x^2 + y^2 - 2rx - 2hy + h^2 = 0$ are

A. $x = 0$

B. $y = 0$

C. $\left(h^2 - r^2\right)x - 2rhy = 0$

D. $\left(h^2 - r^2\right)x + 2rhy = 0$

Answer: A

Watch Video Solution

17. Find the angle between the two tangents from the origin to the circle $(x - 7)^2 + (y + 1)^2 = 25$

A. $\pi/3$

B. $\pi/6$

C. $\pi/2$

D. 0

Answer: C

Watch Video Solution

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

A. $2<r<8$

B. $r=2$

C. $r<2$

D. $r>2$

Answer: A

Watch Video Solution

19. Find the number of common tangent to the circles $x^2 + y^2 + 2x + 8y - 23 = 0$ and $x^2 + y^2 - 4x - 10y + 9 = 0$

A. 1

B. 2

C. 3

D. 4

Answer: C

Watch Video Solution

20. If (x,3) and (3,5) are the extermities of a diameter of a circle with centre at $(2x, y)$ then the values of x and y are

A. (1, 4)

B. (4, 1)

C. (8, 2)

D. none

Answer: A

Watch Video Solution

21. If the lines $2x - 3y = 5$ and $3x - 4y = 7$ are the diameters of a circle of area 154 square units, then obtain the equation of the circle.

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

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

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

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

Answer: B

Watch Video Solution

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

A. (-3, 4)

B. (-3, 4)

C. (3, 4)

D. (3, -4)

Answer: B

Watch Video Solution

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

A. (4, 7)

B. (7, 4)

C. (9, 4)

D. (4, 9)

Answer: A

Watch Video Solution

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

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

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

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

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

Answer: D

Watch Video Solution

25. Tangents drawn from the point P(1,8) to the circle $x^2 + y^2 - 6x - 4y - 11 = 0$ touch the circle at the points A and B. The equation of the circumcircle of the triangle PAB is:

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

B. $x^2 + y^2 - 4x - 10y + 19 = 0$

C. $x^2 + y^2 - 2x + 6y - 29 = 0$

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

Answer: B

Watch Video Solution

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

A. 1

B. 2

C. 3

D. $\sqrt{3}$

Answer: C

Watch Video Solution

27. The intercept on the line y=x by the circle $x^2 + y^2 - 2x = 0$ is AB. Then 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: D

Watch Video Solution

28. The locus of centre of circle passing through (a, b) and cuts orthogonally the circle $x^2 + y^2 = p^2$ is

A. $2ax + 2by - \left(a^2 + b^2 + p^2\right) = 0$

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

C. $x^2 + y^2 - 3ax - 4by + \left(a^2 + b^2 - p^2\right) = 0$

D. $x^2 + y^2 - 2ax + 3by + \left(a^2 - b^2 + p^2\right) = 0$

Answer: A

Watch Video Solution

29. The tangent to the curve $y = e^x$ drawn at the point (c, e^c) intersects the line joining the points $\left(c - 1, e^{c-1}\right)$ and $\left(c + 1, e^{c+1}\right)$

A. on the left of x=c

B. on the right of x=0

C. at no point

D. at all points

Answer: A

Watch Video Solution

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

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

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

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

D. $2ax + 2by + \left(a^2 + b^2 + 4\right) = 0$

Answer: B

Watch Video Solution

31. The locus of centre of the circle which touches the circle $x^2 + (y-1)^2 = 1$ externally and also touches x-axis is

A. $\left\{(x, y) : x^2 + (y-1)^2 = 4\right\} \cup \{(x, y) : y > 0\}$

B. $\{(x, y) : x^2 = 4y\} \cup \{(0, y) : (y < 0)\}$

C. $\{(x, y) : x^2 = y\} \cup \{(0, y) : y < 0\}$

D. $\{(x, y) : x^2 = 4y\} \cup \{(x, y) : y < 0\}$

Answer: B

View Text Solution

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

A. (-5, 2)

B. (2, -5)

C. (5, -2)

D. (-2, 5)

Answer: C

Watch Video Solution

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

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

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

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

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

Answer: D

Watch Video Solution

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

A. $\left(\frac{5}{3}, 0\right)$

B. (0, 0)

C. $\left(\frac{5}{4}, 0\right)$

D. $\left(\frac{5}{2}, 0\right)$

Answer: A

Watch Video Solution

Self Assessment Test (Integer Type Questions)

1. Two parallel chords of a circle of radius 2 are at a distance $\sqrt{3}+1$ apart. If the chords subtend at the centre, angle of $\frac{\pi}{k}$ and $\frac{2\pi}{k}$ where

$k > 0$. Then the value of [k] is

Watch Video Solution

2. The straight line $2x - 3y = 1$ divides the circular region $x^2 + y^2 \leq 6$ into two parts

If $S = \begin{bmatrix} 2 & \frac{3}{4} \\ \frac{5}{2} & \frac{3}{4} \\ \frac{1}{4} & -\frac{1}{4} \\ \frac{1}{8} & \frac{1}{4} \end{bmatrix}$

then the number of points lying inside the smaller part is

View Text Solution

Self Assessment Test (True and False Type Questions)

1. The point (1,2) lies inside the circle $x^2 + y^2 - 2x + 6y + 1 = 0$

Watch Video Solution

2. The line $3x + 5y + 9 = 0$ is a diameter of the circle $x^2 + y^2 - 4x + 6y + 5 = 0.$

Watch Video Solution

3. The equation $x^2 + y^2 + 2x - 10y + 30 = 0$ represents the equation of a circle.

Watch Video Solution

Self Assessment Test (Fill in the blanks)

1. The length of the tangent from the point (1,2) to the circle $2x^2 + 2y^2 + 6x - 8y + 3 = 0$ is ..... .

Watch Video Solution

2. The equation of the circle through M (5, 4) and touching the x-axis at L (2,0) is .....

Watch Video Solution

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

Watch Video Solution

4. The equation of circle of radius 5 in the first quadrant which touches x-axis and the line $4y = 3x$ is .....

Watch Video Solution

5. The equation of circle through origin and cutting intercepts of lengths 2 and 3 from the positive sides of x and y axes is

Watch Video Solution

6. A and B are points in the plane such that $\frac{PA}{PB}$ =k (constant) for all points P on a circle, then the value of k cannot be equal to .....

Watch Video Solution

7. The equation $x^2 + y^2 + 2gx + c = 0$ where g is a parameter and c is a constant represents a family of coaxial circles any two members of which have the radical axis

Watch Video Solution