



MATHS

BOOKS - CENGAGE MATHS (ENGLISH)

CIRCLES

Single Correct Answer Type

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

A. 1

B. -1

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

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

Answer: C



Watch Video Solution

2. All chords of the curve $x^2 + y^2 - 10x - 4y + 4 = 0$ which make a right angle at (8,-2) pass through

A. (2, 5)

B. (-2, -5)

C. (-5, -2)

D. (5, 2)

Answer: D



Watch Video Solution

3. Let $A(1, 2)$, $B(3, 4)$ be two points and $C(x, y)$ be a point such that area of $\triangle ABC$ is 3 sq. units and $(x - 1)(x - 3) + (y - 2)(y - 4) = 0$. Then number of positions of C , in the xy plane is

A. 2

B. 4

C. 8

D. 0

Answer: D



Watch Video Solution

4. 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

5. Equation of circle inscribed in $|x - a| + |y - b| = 1$ is

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

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

C. $(x - a)^2 + (y - b)^2 = \frac{1}{\sqrt{2}}$

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

Answer: B



Watch Video Solution

6. a circle passing through the point $(2, 2(\sqrt{2} - 1))$ touches the pair of lines $x^2 - y^2 - 4x + 4 = 0$. The centre of the circle is

A. $(2, 2\sqrt{2})$ and $(2, 6\sqrt{6} - 8)$

B. $(2, 5\sqrt{2})$ and $(2, 7\sqrt{2})$

C. $(2, 5\sqrt{2} - 1)$ and $(2, -3)$

D. None of these

Answer: A



Watch Video Solution

7. If a chord of a the circle $x^2 + y^2 = 32$ makes equal intercepts of length of l on the co-ordinate axes, then

A. $l < 8$

B. $l < 16$

C. $l > 8$

D. $l > 16$

Answer: A

 [Watch Video Solution](#)

8. P and Q are any two points on the circle $x^2 + y^2 = 4$ such that PQ is a diameter. If α and β are the lengths of perpendiculars from P and Q on $x + y = 1$ then the maximum value of $\alpha\beta$ is

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

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

C. 1

D. 2

Answer: B



Watch Video Solution

9. Let $A(-4, 0)$, $B(4, 0)$ Number of points $c = (x, y)$ on circle $x^2 + y^2 = 16$ such that area of triangle whose vertices are A,B,C is positive integer is:

A. 14

B. 15

C. 16

D. none of these

Answer: B



Watch Video Solution

10. A triangle is inscribed in a circle of radius 1. The distance between the orthocentre and the circumcentre of the triangle cannot be

A. 1

B. 2

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

D. 4

Answer: D



Watch Video Solution

11. The circle with equation $x^2 + y^2 = 1$ intersects the line $y = 7x + 5$ at two distinct points A and B. Let C be the point at which the positive x-axis intersects the circle. The angle ACB is

A. $\tan^{-1}\left(\frac{4}{3}\right)$

B. $\tan^{-1}\left(\frac{3}{4}\right)$

C. $\pi/4$

D. $\tan^{-1}\left(\frac{3}{2}\right)$

Answer: C



Watch Video Solution

12. PA and PB are tangents to a circle S touching it at points A and B. C is a point on S in between A and B as shown in the figure. LCM is a tangent to S intersecting PA and PB in S at points L and M, respectively. Then the perimeter of the triangle PLM depends on o

- A. A,B,C and P
- B. P but not on C
- C. P and C only
- D. the radius of S only

Answer: B



Watch Video Solution

13. Two equal chords AB and AC of the circle $x^2 + y^2 - 6x - 8y - 24 = 0$ are drawn from the point $A(\sqrt{33} + 3, 0)$. Another chord PQ is drawn intersecting AB and AC at points R and S , respectively given that $AR = SC = 7$ and $RB = AS = 3$. The value of PR/QS is

A. 1

B. 1.5

C. 2

D. None of these

Answer: A



Watch Video Solution

14. From a point P outside a circle with centre at C, tangents PA and PB are drawn such that

$$\frac{1}{(CA)^2} + \frac{1}{(PA)^2} = \frac{1}{16},$$
 then the length of chord AB is

A. 6

B. 8

C. 4

D. 12

Answer: B



Watch Video Solution

15. $(1, 2\sqrt{2})$ is a point on circle, $x^2 + y^2 = 9$. Which of the following is not the point on the circle at 2 units distance from $(1, 2\sqrt{2})$?

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

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

C. $\left(\frac{23}{9}, \frac{10\sqrt{2}}{9}\right)$

D. None of these

Answer: B



Watch Video Solution

16. inside the circles $x^2 + y^2 = 1$ there are three circles of equal radius a tangent to each other and to s the value of a equals to

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

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

C. $\sqrt{2}(2 - \sqrt{3})$

D. $\sqrt{3}(\sqrt{3} - 1)$

Answer: B



Watch Video Solution

17. If the curves $\frac{x^2}{4} + y^2 = 1$ and $\frac{x^2}{a^2} + y^2 = 1$ for a suitable value of a cut on four concyclic points, the equation of the circle passing through these four points is

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

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

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

D. none of these

Answer: B



Watch Video Solution

18. AB is a chord of $x^2 + y^2 = 4$ and P(1, 1) trisects AB. Then the length of the chord AB is (a) 1.5 units (c) 2.5 units (b) 2 units (d) 3 units

A. 1.5 units

B. 2 units

C. 2.5 units

D. 3 units

Answer: D



Watch Video Solution

19. AB is a chord of the circle $x^2 + y^2 = \frac{25}{2}$. P is a point such that PA = 4, PB = 3. If AB = 5, then distance of P from origin can be:

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

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

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

D. $\frac{7}{\sqrt{2}}$ or $\frac{1}{\sqrt{2}}$

Answer: D



Watch Video Solution

20. chord AB of the circle $x^2 + y^2 = 100$ passes through the point $(7, 1)$ and subtends an angle of 60° at the circumference of the circle. If m_1 and m_2 are slopes of two such chords then the value of $m_1 \cdot m_2$ is

- A. -1
- B. 1
- C. $7/12$
- D. -3

Answer: A



Watch Video Solution

21. P and Q are two points on a line passing through (2, 4) and having slope m. If a line segment AB subtends a right angles at P and Q, where A(0, 0) and B(6,0), then range of values of m is

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

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

C. $(-4, 4)$

D. $(-\infty, -4) \cup (4, \infty)$

Answer: B



Watch Video Solution

22. In the xy -plane, the length of the shortest path from $(0,0)$ to $(12,16)$ that does not go inside the circle $(x - 6)^2 + (y - 8)^2 = 25$ is

$$10\sqrt{3}$$

$$10\sqrt{5}$$

$$10\sqrt{3} + \frac{5\pi}{3}$$

$$10 + 5\pi$$

A. $10\sqrt{3}$

B. $10\sqrt{5}$

C. $10\sqrt{3} + \frac{5\pi}{3}$

D. $10 + 5\pi$

Answer: C



Watch Video Solution

23. Triangle ABC is right angled at A. The circle with centre A and radius AB cuts BC and AC internally at D and E respectively. If $BD=20$ and $DC=16$ then the length AC equals
(A) $6\sqrt{21}$ (B) $6\sqrt{26}$ (C) 30 (D) 32

A. $6\sqrt{21}$

B. $6\sqrt{26}$

C. 30

D. 32

Answer: B

[Watch Video Solution](#)

24. All chords through an external point to the circle $x^2 + y^2 = 16$ are drawn having length l which is a positive integer. The sum of the squares of the distances from centre of circle to these chords is

A. 154

B. 124

C. 172

D. 128

Answer: A



Watch Video Solution

25. If $m(x - 2) + \sqrt{1 - m^2}y = 3$, is tangent to a circle for all $m \in [-1, 1]$ then the radius of the circle is

A. 1.5

B. 2

C. 4.5

D. 3

Answer: D



Watch Video Solution

26. If the line $3x - 4y - \lambda = 0$ touches the circle $x^2 + y^2 - 4x - 8y - 5 = 0$ at (a, b) then which of the

following is not the possible value of $\lambda + a + b$?

A. 20

B. -28

C. -30

D. none of these

Answer: B



Watch Video Solution

27. The normal at the point $(3, 4)$ on a circle cuts the circle at the point $(-1, -2)$. Then the equation of the circle is

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

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

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

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

Answer: B



Watch Video Solution

28. For all values of $m \in R$ the line $y - mx + m - 1 = 0$ cuts the circle $x^2 + y^2 - 2x - 2y + 1 = 0$ at an angle

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

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

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

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

Answer: C

 **Watch Video Solution**

29. If the line $|y| = x - \alpha$, such that $\alpha > 0$ does not meet the circle $x^2 + y^2 - 10x + 21 = 0$, then α belongs to

- A. $(0, 5 - 2\sqrt{2}) \cup (5 + 2\sqrt{2}, \infty)$
- B. $(5 - 2\sqrt{2}, 5 + 2\sqrt{2})$
- C. $(5 - 2\sqrt{2}, 7)$
- D. none of these

Answer: C

 [Watch Video Solution](#)

30. Let C be the circle of radius unity centred at the origin.

If two positive numbers x_1 and x_2 are such that the line passing through $(x_1, -1)$ and $(x_2, 1)$ is tangent to C then $x_1 \cdot x_2$

A. $x_1 x_2 = 1$

B. $x_1 x_2 = -1$

C. $x_1 + x_2 = 1$

D. $4x_1 x_2 = 1$

Answer: A

 [Watch Video Solution](#)

31. A circle of radius 5 is tangent to the line $4x - 3y = 18$ at $M(3, -2)$ and lies above the line. The equation of the circle is

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

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

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

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

Answer: C



Watch Video Solution

32. The line $y = mx$ intersects the circle $x^2 + y^2 - 2x - 2y = 0$ and $x^2 + y^2 + 6x - 8y = 0$ at point A and B (points being other than origin). The range of m such that origin divides AB internally is

A. $-1 < m < \frac{3}{4}$

B. $m > \frac{4}{3}$ or $m < -2$

C. $-2 < m < \frac{4}{3}$

D. $m > -1$

Answer: A



Watch Video Solution

33. If $C_1: x^2 + y^2 = (3 + 2\sqrt{2})^2$ be a circle. PA and PB are pair of tangents on C_1 where P is any point on the director circle of C_1 , then the radius of the smallest circle which touches C_1 externally and also the two tangents PA and PB is

A. 1

B. 2

C. 3

D. 4

Answer: A



Watch Video Solution

34. From points on the straight line $3x-4y + 12 = 0$, tangents are drawn to the circle $x^2 + y^2 = 4$. Then, the chords of contact pass through a fixed point. The slope of the chord of the circle having this fixed point as its mid-point is

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

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

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

D. none of these

Answer: D

 [Watch Video Solution](#)

35. If tangent at $(1, 2)$ to the circle $C_1: x^2 + y^2 = 5$ intersects the circle $C_2: x^2 + y^2 = 9$ at A and B and tangents at A and B to the second circle meet at point C, then the co-ordinates of C are given by

A. $(4, 5)$

B. $\left(\frac{9}{15}, \frac{18}{5}\right)$

C. $(4, -5)$

D. $\left(\frac{9}{5}, \frac{18}{5}\right)$

Answer: D



Watch Video Solution

36. AB is a line segment of length 48 cm and C is its midpoint. If three semicircles are drawn at AB, AC and CB using as diameters, then radius of the circle inscribed in the space enclosed by three semicircles is

A. $3\sqrt{2}$

B. 6

C. 8

D. 10

Answer: C



Watch Video Solution

37. Consider circles

$$C_1: x^2 + y^2 + 2x - 2y + p = 0$$

$$C_2: x^2 + y^2 - 2x + 2y - p = 0$$

$$C_3: x^2 + y^2 = p^2$$

Statement-I: If the circle C_3 intersects C_1 orthogonally then C_2 does not represent a circle

Statement-II: If the circle C_3 intersects C_2 orthogonally then C_2 and C_3 have equal radii Then which of the following is true?

- A. statement II is false and statement I is true
- B. statement I is false and statement II is true
- C. both the statements are false
- D. both the statements are true

Answer: B



Watch Video Solution

38. Tangents drawn from point of intersection A of circles $x^2 + y^2 = 4$ and $(x - \sqrt{3})^2 + (y - 3)^2 = 4$ cut the line joining their centres at B and C Then triangle BAC is

A. equilateral triangle

B. right angle triangle

C. obtuse angle triangle

D. isosceles triangle and $\angle ABC = \frac{\pi}{6}$

Answer: A



Watch Video Solution

39. Suppose that two circles C_1 and C_2 in a plane have no points in common. Then

A. there is no line tangent to both C_1 and C_2

B. there are exactly four lines tangent to both C_1 and C_2

C. there are no lines tangent to both C_1 and C_2 or there are exactly two lines tangent to both C_1 and C_2

D. there are no lines tangent to both C_1 and C_2 or there are exactly four lines tangent to both C_1 and C_2

Answer: D



Watch Video Solution

40. A circle of radius 2 has its centre at $(2, 0)$ and another circle of radius 1 has its centre at $(5, 0)$. A line is tangent to the two circles at point in the first quadrant. The y -intercept of the tangent line is

- A. $\sqrt{2}$
- B. $2\sqrt{2}$
- C. $3\sqrt{2}$
- D. $4\sqrt{2}$

Answer: B



Watch Video Solution

41. Let circle $C_1: x^2 + (y - 4)^2 = 12$ intersects circle $C_2: (x - 3)^2 + y^2 = 13$ at A and B. A quadrilateral ACBD is formed by tangents at A and B to both circles. The diameter of circumcircle of quadrilateral ACBD is

A. 4

B. 5

C. 6

D. 9.25

Answer: B



Watch Video Solution

42. Transverse common tangents are drawn from O to the two circles C_1, C_2 with 4, 2 respectively. Then the ratio of the areas of triangles formed by the tangents drawn from O to the circles C_1 and C_2 and chord of contacts of O w.r.t the circles C_1 and C_2 respectively is

- A. 3 units
- B. 6 units
- C. 4 units
- D. 5 units

Answer: C



Watch Video Solution

43. Equation of the straight line meeting the circle with centre at origin and radius equal to 5 in two points at equal distances of 3 units from the point (3,4) is

A. $6x + 8y = 41$

B. $6x - 8y + 41 = 0$

C. $8x + 6y + 41 = 0$

D. $8x - 6y + 41 = 0$

Answer: A



Watch Video Solution

44. 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. $2\sqrt{2}$

B. $\sqrt{2}$

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

D. none of these

Answer: A



Watch Video Solution

45. Tangents drawn from $P(1, 8)$ to the circle $x^2 + y^2 - 6x - 4y - 11 = 0$ touches the circle at the points A and B, respectively. The radius of the circle which passes through the points of intersection of circles $x^2 + y^2 - 2x - 6y + 6 = 0$ and $x^2 + y^2 - 2x - 6y + 6 = 0$ the circumcircle of the and interse ΔPAB orthogonally is equal to

A. $\frac{\sqrt{73}}{4}$

B. $\frac{\sqrt{71}}{2}$

C. 3

D. 2

Answer: A



Watch Video Solution

46. If the radius of the circle touching the pair of lines $7x^2 - 18xy + 7y^2 = 0$ and the circle $x^2 + y^2 - 8x - 8y = 0$, and contained in the given circle is equal to k , then k^2 is equal to

- A. 10
- B. 9
- C. 8
- D. 7

Answer: C



Watch Video Solution

47. Equation of a circle having radius equal to twice the radius of the circle $x^2 + y^2 + (2p + 3)x + (3 - 2p)y + p - 3 = 0$ and touching it at the origin is

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

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

C. $x^2 + y^2 + 18x + 6y = 0$

D. $x^2 + y^2 + 18x - 6y = 0$

Answer: D



Watch Video Solution

48. Tangents PT_1 , and PT_2 , are drawn from a point P to the circle $x^2 + y^2 = a^2$. If the point P lies on the line $Px + qy + r = 0$, then the locus of the centre of circumcircle of the triangle PT_1T_2 is

A. $px + qy = r$

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

C. $px + qy = \frac{r}{2}$

D. $2px + 2qy + r = 0$

Answer: D



Watch Video Solution

49. An isosceles triangle with base 24 and legs 15 each is inscribed in a circle with centre at $(-1, 1)$. The locus of the centroid of that Δ is

A. $4(x^2 + y^2) + 8x - 8y - 73 = 0$

B. $2(x^2 + y^2) + 4x - 4y - 31 = 0$

C. $2(x^2 + y^2) + 4x - 4y - 21 = 0$

D. $4(x^2 + y^2) + 8x - 8y - 161 = 0$

Answer: D



Watch Video Solution

50. $x^2 + y^2 = 16$ and $x^2 + y^2 = 36$ are two circles. If P and Q move respectively on these circles such that $PQ = 4$ then the locus of mid-point of PQ is a circle of radius

A. $\sqrt{20}$

B. $\sqrt{22}$

C. $\sqrt{30}$

D. $\sqrt{32}$

Answer: B



Watch Video Solution

51. A variable line moves in such a way that the product of the perpendiculars from $(4, 0)$ and $(0, 0)$ is equal to 9. The locus of the feet of the perpendicular from $(0, 0)$ upon the variable line is a circle, the square of whose radius is

A. 13

B. 15

C. 19

D. 23

Answer: A



Watch Video Solution

52. The locus of the mid-points of the chords of the circle of radius r which subtend an angle $\frac{\pi}{4}$ at any point on the circumference of the circle is a concentric circle with radius equal to (a) $\frac{r}{2}$ (b) $\frac{2r}{3}$ (c) $\frac{r}{\sqrt{2}}$ (d) $\frac{r}{\sqrt{3}}$

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

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

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

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

Answer: C



Watch Video Solution

53. Tangents PA and PB are drawn to $x^2 + y^2 = 9$ from any arbitrary point P on the line $x + y = 25$. The locus of the midpoint of chord AB is $25(x^2 + y^2) = 9(x + y)$
 $25(x^2 + y^2) = 3(x + y)$ $5(x^2 + y^2) = 3(x + y)$

none of these

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

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

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

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

Answer: A



Watch Video Solution

54. The locus of the centre of a circle which cuts a given circle orthogonally and also touches a given straight line is (a) circle (c) parabola (b) line (d) ellipse

A. circle

B. line

C. parabola

D. ellipse

Answer: C



Watch Video Solution

55. A circle with radius $|a|$ and center on the y-axis slid along it and a variable line through $(a, 0)$ cuts the circle at

points P and Q . The region in which the point of intersection of the tangents to the circle at points P and Q lies is represented by $y^2 \geq 4(ax - a^2)$ (b) $y^2 \leq 4(ax - a^2)$ (c) $y \geq 4(ax - a^2)$ (d) $y \leq 4(ax - a^2)$

A. $y^2 \geq 4a(x - a)$

B. $y^2 \leq 4ax$

C. $x^2 + y^2 \leq 4a^2$

D. $x^2 - y^2 \geq a^2$

Answer: A



Watch Video Solution

56. The locus of the point at which two given unequal circles subtend equal angles is: (A) a straight line (B) a circle (C) a parabola (D) an ellipse

A. a straight line

B. a circle

C. a parabola

D. none of these

Answer: B



Watch Video Solution

57. The locus of the centre of the circle which bisects the circumferences of the circles

$x^2 + y^2 = 4$ & $x^2 + y^2 - 2x + 6y + 1 = 0$ is :

A. $2x - 6y - 15 = 0$

B. $2x + 6y + 15 = 0$

C. $2x - 6y + 15 = 0$

D. $2x + 6y - 15 = 0$

Answer: A



Watch Video Solution

58. The centre of family of circles cutting the family of circles

$$x^2 + y^2 + 4x\left(\lambda - \frac{3}{2}\right) + 3y\left(\lambda - \frac{4}{3}\right) - 6(\lambda + 2) = 0$$

orthogonally, lies on

A. $x - y - 1 = 0$

B. $4x + 3y - 6 = 0$

C. $4x + 3y + 7 = 0$

D. $3x - 4y - 1 = 0$

Answer: B

 [Watch Video Solution](#)

1. Line $3x + 6y = k$ intersect the curve $2x^2 + 3y^2 + 2xy = 1$ at points A and B. The circle on AB as diameter passes through origin, then sum of all possible values of 'k' is

A. 3

B. 4

C. -4

D. -3

Answer: A:D



Watch Video Solution

2. Consider the circle $x^2 + y^2 - 8x - 18y + 93 = 0$ with the center C and a point $P(2, 5)$ outside it. From P a pair of tangents PQ and PR are drawn to the circle with S as mid point of QR. The line joining P to C intersects the given circle at A and B. Which of the following hold (s)

A. CP is the arithmetic mean of AP and BP

B. PR is the geometric mean of PS and PC

C. PS is the harmonic mean of PA and PB

D. The angle between the two tangents from P is

$$\tan^{-1}\left(\frac{4}{3}\right)$$

Answer: A::B::C::D



Watch Video Solution

3. Consider two circles $C_1: x^2 + y^2 - 1 = 0$ and $C_2: x^2 + y^2 - 2 = 0$. Let $A(1,0)$ be a fixed point on the circle C_1 and B be any variable point on the circle C_2 . The line BA meets the curve C_2 again at C . Which of the following alternative(s) is/are correct?

A. $OA^2 + OB^2 + BC^2 \in [7, 11]$, where O is the origin

B. $OA^2 + OB^2 + BC^2 \in [4, 7]$, where O is the origin

C. Locus of midpoint of AB is a circle of radius $\frac{1}{\sqrt{2}}$

D. Locus of midpoint of AB is a circle of area $\frac{\pi}{2}$

Answer: A:C

 [Watch Video Solution](#)

4. The real numbers a and b are distinct. Consider the circles

$$\omega_1: (x - a)^2 + (y - b)^2 = a^2 + b^2 \text{ and}$$

$$\omega_2: (x - b)^2 + (y - a)^2 = a^2 + b^2$$

Which of the following is (are) true?

A. The line $y = x$ is an axis of symmetry for the circles

B. The circles intersect at the origin and a point, P(say),

which lies on the line $y = x$

C. The line $y = x$ is the radical axis of the pair of circles.

D. The circles are orthogonal for all $a \neq b$.

Answer: A::B::C

5. Consider two circles

$$S_1 = x^2 + y^2 + 8x = 0 \text{ and } S_2 = x^2 + y^2 - 2x = 0.$$

Let ΔPOR be formed by the common tangents to circles

S_1 and S_2 , Then which of the following hold(s) good?

A. Incentre of ΔPQR is (1,0)

B. The equation of radical axis of circles S_1 and S_2 is

$$y = 0$$

C. Product of slope of direct common tangents is $\frac{16}{9}$

D. If transverse common tangent intersects direct

common tangents at points A and B, then AB equals

4.

Answer: A::D

 Watch Video Solution

6. A circle touching the line $x + y - 2 = 0$ at $(1,1)$ and cuts the circle $x^2 + y^2 + 4x + 5y - 6 = 0$ at P and Q. Then

A. PQ can never be parallel to the given line

$$x + y - 2 = 0$$

B. PQ can never be perpendicular to the given line

$$x + y - 2 = 0$$

C. PQ always passes through $(6, -4)$

D. PQ always passes through $(-6, 4)$

Answer: A::B::C

 [Watch Video Solution](#)

7. A circle $S = 0$ passes through the common points of family of circles $x^2 + y^2 + \lambda x - 4y + 3 = 0$ and $(\lambda \in R)$ has minimum area then

- A. area of $S = 0$ is π sq. units
- B. radius of director circle of $S = 0$ is $\sqrt{2}$
- C. radius of director circle of $S = 0$ is 1 unit
- D. $S = 0$ never cuts $|2x| = 1$

Answer: A::B::D

 [Watch Video Solution](#)

8. Q is any point on the circle $x^2 + y^2 = 9$. QN is perpendicular from Q to the x-axis. Locus of the point of trisection of QN is

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

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

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

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

Answer: A:D



Watch Video Solution

9. Locus of the intersection of the two straight lines passing through $(1, 0)$ and $(-1, 0)$ respectively and including an angle of 45° can be a circle with (a) centre $(1, 0)$ and radius $\sqrt{2}$ (b) centre $(1, 0)$ and radius 2 (c) centre $(0, 1)$ and radius $\sqrt{2}$ (d) centre $(0, -1)$ and radius $\sqrt{2}$

A. curve $(1, 0)$ and radius $\sqrt{2}$

B. centre $(1, 0)$ and radius 2

C. centre $(0, 1)$ and radius $\sqrt{2}$

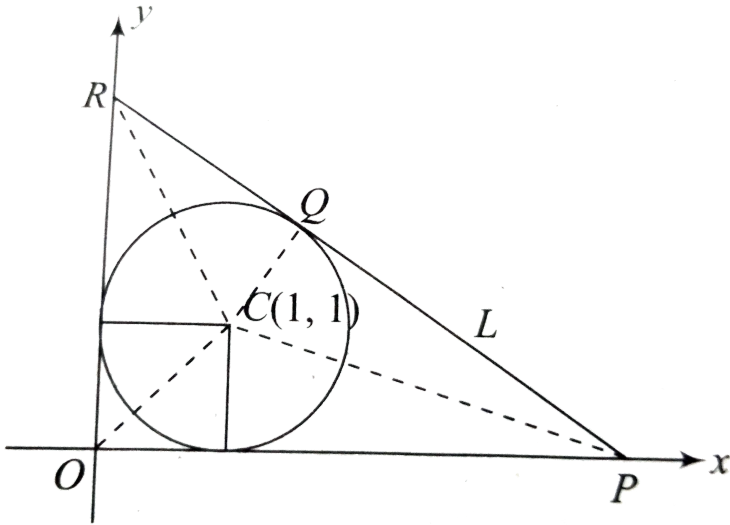
D. centre $(0, -1)$ and radius $\sqrt{2}$

Answer: C::D



Watch Video Solution

Comprehension Type



1.

In the diagram as shown, a circle is drawn with centre $C(1, 1)$ and radius 1 and a line L . The line L is tangent to the circle at Q . Further L meets the y -axis at R and the x -axis at P in such a way that the angle OPQ equals θ where $0 < \theta < \frac{\pi}{2}$.

Area of triangle OPR when $\theta = \pi/4$ is

A. $(1 + \cos \theta, 1 + \sin \theta)$

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

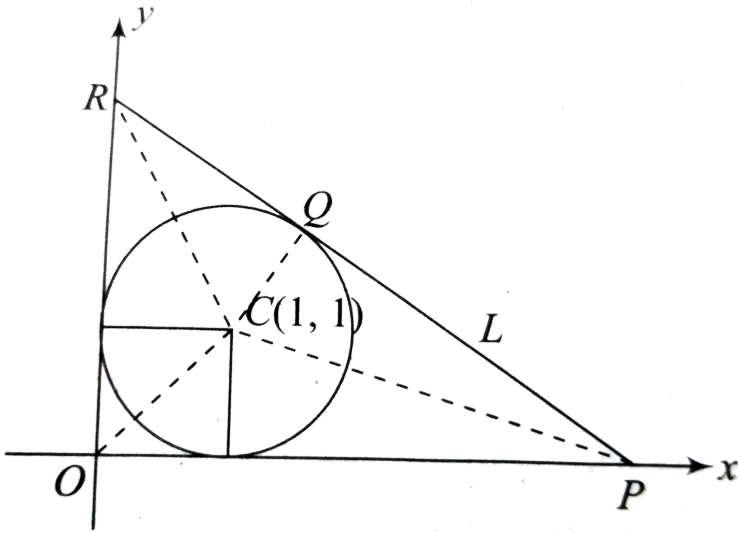
C. $(1 + \sin \theta, \cos \theta)$

D. $(1 + \sin \theta, 1 + \cos \theta)$

Answer: D



Watch Video Solution



2.

In the diagram as shown, a circle is drawn with centre $C(1, 1)$ and radius 1 and a line L . The line L is tangent to the circle at Q . Further L meets the y -axis at R and the x -axis at P in such a way that the angle OPQ equals θ where

$$0 < \theta < \frac{\pi}{2}.$$

Equation of the line PR is

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

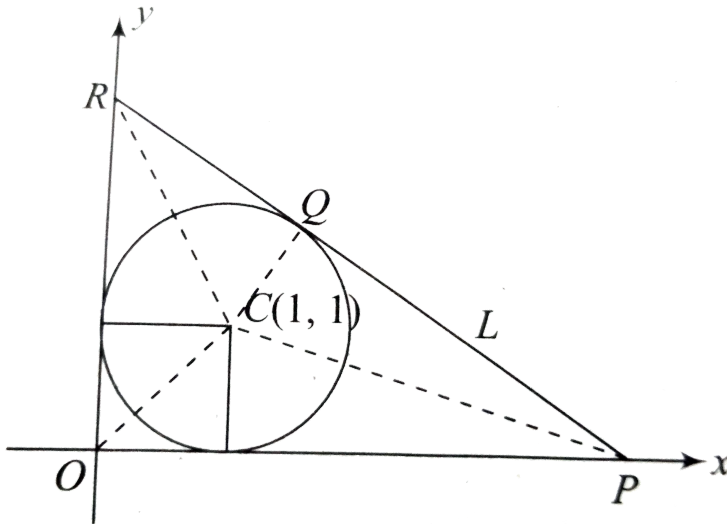
B. $x \sin \theta + y \cos \theta = \cos \theta + \sin \theta - 1$

C. $x \sin \theta + y \cos \theta = \cos \theta + \sin \theta + 1$

D. $x \tan \theta + y = 1 + \cot \left(\frac{\theta}{2} \right)$

Answer: C

 **Watch Video Solution**



3.

In the diagram as shown, a circle is drawn with centre

$C(1, 1)$ and radius 1 and a line L. The line L is tangent to the circle at Q. Further L meets the y-axis at R and the x-axis at P in such a way that the angle OPQ equals θ where $0 < \theta < \frac{\pi}{2}$.

Area of triangle OPR when $\theta = \pi/4$ is

- A. $(3 - 2\sqrt{2})$
- B. $(3 + 2\sqrt{2})$
- C. $(6 + 4\sqrt{2})$
- D. none of these

Answer: B



Watch Video Solution

4. Let $P(\alpha, \beta)$ be a point in the first quadrant. Circles are drawn through P touching the coordinate axes.

Radius of one of the circles is

A. $(\sqrt{\alpha} - \sqrt{\beta})^2$

B. $(\sqrt{\alpha} + \sqrt{\beta})^2$

C. $\alpha + \beta - \sqrt{\alpha\beta}$

D. $\alpha + \beta - \sqrt{2\alpha\beta}$

Answer: D



Watch Video Solution

5. $P(\alpha, \beta)$ is a point in first quadrant. If two circles which passes through point P and touches both the coordinate axis, intersect each other orthogonally, then

A. $\alpha^2 + \beta^2 = 4\alpha\beta$

B. $(\alpha + \beta)^2 = 4\alpha\beta$

C. $\alpha^2 + \beta^2 = \alpha\beta$

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

Answer: A



Watch Video Solution

6. Let $P(\alpha, \beta)$ be a point in the first quadrant. Circles are drawn through P touching the coordinate axes.

Equation of common chord of two circles is

A. $x + y = \alpha - \beta$

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

C. $x + y = \alpha + \beta$

D. $\alpha^2 - \beta^2 = 4\alpha\beta$

Answer: C



Watch Video Solution

7. $P(a, 5a)$ and $Q(4a, a)$ are two points. Two circles are drawn through these points touching the axis of y .

Centre of these circles are at

A. $(a, a), (2a, 3a)$

B. $\left(\frac{205a}{18}, \frac{29a}{3}\right), \left(\frac{5a}{2}, 3a\right)$

C. $\left(3a, \frac{29a}{3}\right), \left(\frac{205a}{9}, \frac{29a}{18}\right)$

D. None of these

Answer: B



Watch Video Solution

8. Two circles are drawn through the points $(a, 5a)$ and $(4a, a)$ to touch the y-axis. Prove that they intersect at angle $\tan^{-1}\left(\frac{40}{9}\right)$.

A. $\tan^{-1}(4/3)$

B. $\tan^{-1}(40/9)$

C. $\tan^{-1}(84/187)$

D. $\pi/4$

Answer: B



Watch Video Solution