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MATHEMATICS · JEE MAIN

Circles

Previous Year Questions with answers

200 questions · **157** papers · **2002–2026** · newest paper first

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What is in this PDF: every Circles question we hold from past JEE Main and AIEEE papers, with its options and answer. Where an answer comes from a source other than the official final key, it says so next to the answer.

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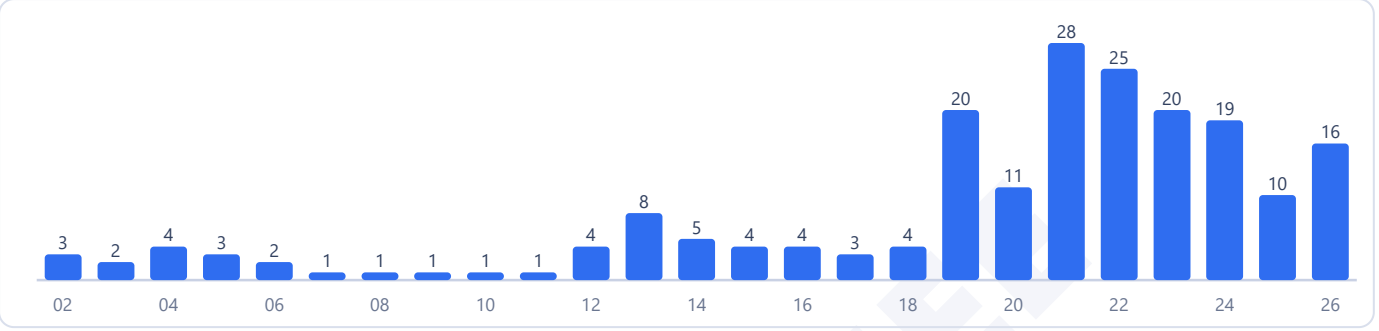
Chapter at a glance

3.3%	200	121 of 162	155 / 45
of Mathematics questions, 2019–2026	questions, 2002–2026	papers asked it, 2019–2026	MCQ / numerical, 2002–2026

Trend. Falling: 0.8 questions per paper in 2024–2026 against 1 in 2019–2023.

Questions per year



Counts are the questions we hold: 200 in 157 papers. No question in this chapter was found repeated across papers.

Most-asked topics in this chapter (2002–2026)



How often it comes up

Circles forms the central pillar of conic geometry under Unit 10: Coordinate Geometry in the Class 11 curriculum, placing it at rank 17 among the 29 chapters in the subject. Across the 162 papers conducted between 2019 and 2026, the examination contained 149 questions from this chapter, representing 3.3 percent of all mathematics questions. It appeared in 121 of those 162 papers and has been tested every year since 2019. Over the recent 2024 to 2026 testing period, 45 questions were asked across 58 papers, averaging 0.8 questions per paper with a 2.9 percent subject share. Comparing the earlier 2002 to 2018 share of 3.9 percent against 2024 to 2026 indicates that its long-term share is down, while comparing 2019 to 2026 with 2024 to 2026 shows it is about the same. Across the complete archive from 2002 to 2026 spanning 200 papers, 200 questions were asked in 157 papers, with 45 numerical answer questions appearing between 2019 and 2026.

The annual question tallies for 2024, 2025, and 2026 were 19, 10, and 16 questions respectively.

Examiners frequently combine circles with lines, parabolas, and ellipses. Questions commonly ask for the locus of a moving geometric point or investigate mutual intersection properties between two circular boundaries, demanding both algebraic speed and geometric intuition.

Most-asked topics

Questions in this chapter divide across three central thematic areas:

1. **Equation of a Circle (55 questions, 2019-2026; 77 total, last asked 2026)** Focuses on general second-degree equations representing circles, finding centres and radii, equations of circles passing through three non-collinear points, diametric forms, intercept lengths on coordinate axes, and parametric representations.

2. **Tangents & Normals (48 questions, 2019-2026; 56 total, last asked 2026)** Involves conditions of tangency where the perpendicular distance from the centre matches the radius, equations of tangents in slope and point

forms, lengths of tangents from an external point, chords of contact, and normals passing through the centre.

3. **Family of Circles & Two Circles (46 questions, 2019-2026; 67 total, last asked 2026)** Covers relative positions of two circles, conditions for internal and external contact, number of common tangents, equations of common chords, radical axes, orthogonal intersection criteria, and families of circles passing through the intersections of a circle and a line.

What the questions look like

Examiners test circle geometry using several recurring problem templates:

- **Tangency Condition via Distance Formula**: A line touches a circle if and only if the perpendicular distance from the centre equals the radius. Many problems use this condition to establish relations between unknown slope or intercept constants.
- **Two-Circle Interaction and Common Tangents**: Evaluating the distance between centres relative to the sum and difference of their radii to determine whether two circles intersect in two distinct points, touch at one point, or remain mutually disjoint.
- **Locus of Chord Midpoints or Tangent Intersections**: A chord subtends a given angle at the centre, or tangents drawn from an external point meet at a fixed angle, requiring the locus equation of the external intersection point.
- **Circle Through Conic Intersections**: Determining the radius or equation of a circle that passes through all four points of intersection between two concentric or confocal ellipses.

How to practise it

Mastering circle problems requires blending pure geometry with coordinate methods:

- **Prefer pure geometry over calculus**: To find the equation of a tangent or normal to a circle, avoid differentiating the implicit equation. Always use the geometric criterion: the perpendicular distance from the centre to the tangent line equals the radius, and every normal passes through the centre.
- **Leverage the diametric form**: When given two opposite endpoints of a diameter, write the circle directly as the product of x minus x1 and x minus x2 plus the product of y minus y1 and y minus y2 equals zero, saving multiple steps of finding the midpoint and squaring the radius.
- **Use the circle-line family formulation**: To write the equation of any circle passing through the intersection points of a circle S and a line L, use S plus lambda L equals zero. The single scalar parameter lambda is determined by enforcing a point constraint or centre locus.
- **Exploit common chord properties**: Subtracting the equations of two circles with unit leading coefficients immediately gives the equation of their common chord or radical axis without calculating individual intersection coordinates.

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Q1 JEE Main 2026 · 8 Apr · Shift 2 Numerical

Consider the circle $C: x^2+y^2-6x-8y-11=0$. Let a variable chord AB of the circle C subtend a right angle at the origin. If the locus of the foot of the perpendicular drawn from the origin on the chord AB is the circle $x^2+y^2-\alpha x-\beta y-\gamma=0$, then $\alpha+\beta+2\gamma$ is equal to _____.

Numerical value type: the answer is a number.

Answer: 18. · Official NTA final key

Q2 JEE Main 2026 · 6 Apr · Shift 1 Numerical

Let the centre of the circle $x^2+y^2+2gx+2fy+25=0$ be in the first quadrant and lie on the line $2x-y=4$. Let the area of an equilateral triangle inscribed in the circle be $27\sqrt{3}$. Then the square of the length of the chord of the circle on the line $x=1$ is _____.

Numerical value type: the answer is a number.

Answer: 80. · Official NTA final key

Q3 JEE Main 2026 · 6 Apr · Shift 2 MCQ

Let C be a circle having centre in the first quadrant and touching the x-axis at a distance of 3 units from the origin. If the circle C has an intercept of length $6\sqrt{3}$ on y-axis, then the length of the chord of the circle C on the line $x-y=3$ is :

(A) 8
(B) 6
(C) $6\sqrt{2}$
(D) $8\sqrt{2}$

Answer: (C) $6\sqrt{2}$ · Official NTA final key

Q4 JEE Main 2026 · 6 Apr · Shift 2 Numerical

Let the line $x-y=4$ intersect the circle $C: (x-4)^2+(y+3)^2=9$ at the points Q and R. If $P(\alpha,\beta)$ is a point on C such that PQ = PR, then $(6\alpha+8\beta)^2$ is equal to _____.

Numerical value type: the answer is a number.

Answer: 18. · Official NTA final key

Q5 JEE Main 2026 · 5 Apr · Shift 1 MCQ

Let P be a moving point on the circle $x^2+y^2-6x-8y+21=0$. Then, the maximum distance of P from the vertex of the parabola $x^2+6x+y+13=0$ is equal to:

(A) 8
(B) 10
(C) 12
(D) 9

Answer: (C) 12 · Official NTA final key

Q6 JEE Main 2026 · 5 Apr · Shift 2 MCQ

Let the point P be the vertex of the parabola $y = x^2 - 6x + 12$. If a line passing through the point P intersects the circle $x^2 + y^2 - 2x - 4y + 3 = 0$ at the points R and S, then the maximum value of $(\mathrm{PR} + \mathrm{PS})^2$ is :

(A) 10
(B) 20
(C) 25
(D) 5

Answer: (B) 20 · Official NTA final key

Q7 JEE Main 2026 · 4 Apr · Shift 1 MCQ

Suppose that two chords, drawn from the point $(1, 2)$ on the circle $x^2 + y^2 + x - 3y = 0$ are bisected by the y-axis. If the other ends of these chords are R and S, and the mid point of the line segment RS is (α, β), then $6(\alpha + \beta)$ is equal to:

(A) 1
(B) 3
(C) 4
(D) 6

Answer: (B) 3 · Official NTA final key

Q8 JEE Main 2026 · 2 Apr · Shift 1 Numerical

Let a circle C have its centre in the first quadrant, intersect the coordinate axes at exactly three points and cut off equal intercepts from the coordinate axes. If the length of the chord of C on the line $x + y = 1$ is $\sqrt{14}$, then the square of the radius of C is _____.

Numerical value type: the answer is a number.

Answer: 8. · Official NTA final key

Q9 JEE Main 2026 · 2 Apr · Shift 2 MCQ

Let a circle pass through the origin and its centre be the point of intersection of two mutually perpendicular lines $x + (\mathrm{k} - 1)y + 3 = 0$ and $2x + \mathrm{k}^2 y - 4 = 0$. If the line $x - y + 2 = 0$ intersects the circle at the points A and B, then $(\mathrm{AB})^2$ is equal to :

(A) 10
(B) 27
(C) 18
(D) 34

Answer: (C) 18 · Official NTA final key

Q10 JEE Main 2026 · 28 Jan · Shift 1 MCQ

Let $y = x$ be the equation of a chord of the circle C_1 (in the closed half-plane $x \geq 0$) of diameter 10 passing through the origin. Let C_2 be another circle described on the given chord as its diameter. If the equation of the chord of the circle C_2, which passes through the point (2, 3) and is farthest from the center of C_2, is $x + ay + b = 0$, then $a - b$ is equal to

(A) -2
(B) 10
(C) -6
(D) 6

Answer: (A) -2 · Official NTA final key

Q11 JEE Main 2026 · 28 Jan · Shift 2 MCQ

Let the circle $x^2 + y^2 = 4$ intersect x-axis at the points A(a, 0), $a > 0$ and B(b, 0). Let P$(2\cos\alpha, 2\sin\alpha)$, $0 < \alpha < \frac{\pi}{2}$ and Q$(2\cos\beta, 2\sin\beta)$ be two points such that $(\alpha - \beta) = \frac{\pi}{2}$. Then the point of intersection of AQ and BP lies on :

(A) $x^2 + y^2 - 4x - 4y - 4 = 0$
(B) $x^2 + y^2 - 4x - 4 = 0$
(C) $x^2 + y^2 - 4y - 4 = 0$
(D) $x^2 + y^2 - 4x - 4y = 0$

Answer: (C) $x^2 + y^2 - 4y - 4 = 0$ · Official NTA final key

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Q12 JEE Main 2026 · 24 Jan · Shift 1 MCQ

Let a circle of radius 4 pass through the origin O, the points A $\left(-\sqrt{3}a, 0\right)$ and B $\left(0, -\sqrt{2}b\right)$, where a and b are real parameters and $ab \neq 0$. Then the locus of the centroid of ΔOAB is a circle of radius

(A) $\frac{8}{3}$
(B) $\frac{5}{3}$
(C) $\frac{11}{3}$
(D) $\frac{7}{3}$

Answer: (A) $\frac{8}{3}$ · Official NTA final key

Q13 JEE Main 2026 · 23 Jan · Shift 2 MCQ

If the points of intersection of the ellipses $x^2 + 2y^2 - 6x - 12y + 23 = 0$ and $4x^2 + 2y^2 - 20x - 12y + 35 = 0$ lie on a circle of radius r and centre (a, b), then the value of $ab + 18r^2$ is

(A) 53
(B) 51
(C) 55
(D) 52

Answer: (C) 55 · Official NTA final key

Q14 JEE Main 2026 · 22 Jan · Shift 1 MCQ

Let the set of all values of r, for which the circles $(x+1)^2 + (y+4)^2 = r^2$ and $x^2 + y^2 - 4x - 2y - 4 = 0$ intersect at two distinct points be the interval (α, β). Then $\alpha\beta$ is equal to

(A) 25
(B) 21
(C) 24
(D) 20

Answer: (A) 25 · Official NTA final key

Q15 JEE Main 2026 · 21 Jan · Shift 1 MCQ

Let PQ and MN be two straight lines touching the circle $x^2 + y^2 - 4x - 6y - 3 = 0$ at the points A and B respectively. Let O be the centre of the circle and $\angle AOB = \pi/3$. Then the locus of the point of intersection of the lines PQ and MN is :

(A) $x^2 + y^2 - 18x - 12y - 25 = 0$
(B) $3(x^2 + y^2) - 18x - 12y + 25 = 0$
(C) $3(x^2 + y^2) - 12x - 18y - 25 = 0$
(D) $x^2 + y^2 - 12x - 18y - 25 = 0$

Answer: (C) $3(x^2 + y^2) - 12x - 18y - 25 = 0$ · Official NTA final key

Q16 JEE Main 2026 · 21 Jan · Shift 1 MCQ

Let $\vec{c}$ and $\vec{d}$ be vectors such that $|\vec{c} + \vec{d}| = \sqrt{29}$ and $\vec{c} \times (2\hat{i} + 3\hat{j} + 4\hat{k}) = (2\hat{i} + 3\hat{j} + 4\hat{k}) \times \vec{d}$. If λ_1, λ_2 ($\lambda_1 > \lambda_2$) are the possible values of $(\vec{c} + \vec{d}) \cdot (-7\hat{i} + 2\hat{j} + 3\hat{k})$, then the equation $\mathrm{K}^2x^2 + (\mathrm{K}^2 - 5\mathrm{K} + \lambda_1)xy + \left(3\mathrm{K} + \frac{\lambda_2}{2}\right)y^2 - 8x + 12y + \lambda_2 = 0$ represents a circle, for K equal to :

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(A) 2
(B) -1
(C) 1
(D) 4

Answer: (C) 1 · Official NTA final key

Q17 JEE Main 2025 · 7 Apr · Shift 1 MCQ

Let C_1 be the circle in the third quadrant of radius 3, that touches both coordinate axes. Let C_2 be the circle with centre (1,3) that touches C_1 externally at the point (α, β). If $(\beta - \alpha)^2 = \frac{m}{n}$, gcd(m,n) = 1, then $m + n$ is equal to

(A) 13
(B) 22
(C) 9
(D) 31

Answer: (B) 22 · Key from source paper

Q18 JEE Main 2025 · 3 Apr · Shift 2 MCQ

If the four distinct points $(4, 6), (-1, 5), (0, 0)$ and $(k, 3k)$ lie on a circle of radius r, then $10k + r^2$ is equal to

(A) 32
(B) 35
(C) 34
(D) 33

Answer: (B) 35 · Key from source paper

Q19 JEE Main 2025 · 2 Apr · Shift 1 Numerical

The absolute difference between the squares of the radii of the two circles passing through the point $(-9, 4)$ and touching the lines $x + y = 3$ and $x - y = 3$, is equal to _____

Numerical value type: the answer is a number.

Answer: 768. · Key from source paper

Q20 JEE Main 2025 · 29 Jan · Shift 1 MCQ

Let the line $x + y = 1$ meet the circle $x^2 + y^2 = 4$ at the points A and B . If the line perpendicular to AB and passing through the mid point of the chord AB intersects the circle at C and D, then the area of the quadrilateral ADBC is equal to :

(A) $\sqrt{14}$
(B) $3\sqrt{7}$
(C) $2\sqrt{14}$
(D) $5\sqrt{7}$

Answer: (C) $2\sqrt{14}$ · Key from source paper

Q21 JEE Main 2025 · 29 Jan · Shift 2 MCQ

Let a circle C pass through the points $(4, 2)$ and $(0, 2)$, and its centre lie on $3x + 2y + 2 = 0$. Then the length of the chord, of the circle C, whose mid-point is $(1, 2)$, is :

(A) $\sqrt{3}$
(B) $2\sqrt{2}$
(C) $2\sqrt{3}$
(D) $4\sqrt{2}$

Answer: (C) $2\sqrt{3}$ · Key from source paper

Q22 JEE Main 2025 · 28 Jan · Shift 1 MCQ

Let the equation of the circle, which touches x-axis at the point $(a, 0), a > 0$ and cuts off an intercept of length b on y-axis be $x^2 + y^2 - \alpha x + \beta y + \gamma = 0$. If the circle lies below x-axis, then the ordered pair $(2a, b^2)$ is equal to

(A) $(\gamma, \beta^2 - 4\alpha)$
(B) $(\alpha, \beta^2 + 4\gamma)$
(C) $(\gamma, \beta^2 + 4\alpha)$
(D) $(\alpha, \beta^2 - 4\gamma)$

Answer: (D) $(\alpha, \beta^2 - 4\gamma)$ · Key from source paper

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Q23 JEE Main 2025 · 24 Jan · Shift 1 MCQ

Let circle C be the image of $x^2 + y^2 - 2x + 4y - 4 = 0$ in the line $2x - 3y + 5 = 0$ and A be the point on C such that OA is parallel to x-axis and A lies on the right hand side of the centre O of C. If $B(\alpha, \beta)$, with $\beta < 4$, lies on C such that the length of the are AB is $(1/6)^{\text{th}}$ of the perimeter of C, then $\beta - \sqrt{3}\alpha$ is equal to

(A) $3 + \sqrt{3}$
(B) 4
(C) $4 - \sqrt{3}$
(D) 3

Answer: (B) 4 · Key from source paper

Q24 JEE Main 2025 · 23 Jan · Shift 2 Numerical

The focus of the parabola $y^2 = 4x + 16$ is the centre of the circle C of radius 5 . If the values of λ, for which C passes through the point of intersection of the lines $3x - y = 0$ and $x + \lambda y = 4$, are λ_1 and λ_2, $\lambda_1 < \lambda_2$, then $12\lambda_1 + 29\lambda_2$ is equal to

Numerical value type: the answer is a number.

Answer: 15. · Key from source paper

Q25 JEE Main 2025 · 22 Jan · Shift 1 MCQ

Let the parabola $y = x^2 + px - 3$, meet the coordinate axes at the points P, Q and R . If the circle C with centre at $(-1, -1)$ passes through the points P, Q and R, then the area of $\triangle PQR$ is :

(A) 7
(B) 4
(C) 6
(D) 5

Answer: (C) 6 · Key from source paper

Q26 JEE Main 2025 · 22 Jan · Shift 1 MCQ

A circle C of radius 2 lies in the second quadrant and touches both the coordinate axes. Let r be the radius of a circle that has centre at the point $(2, 5)$ and intersects the circle C at exactly two points. If the set of all possible values of r is the interval (α, β), then $3\beta - 2\alpha$ is equal to :

(A) 10
(B) 15
(C) 12
(D) 14

Answer: (B) 15 · Key from source paper

Q27 JEE Main 2024 · 9 Apr · Shift 1 MCQ

Let a circle passing through $(2, 0)$ have its centre at the point (h, k). Let (x_c, y_c) be the point of intersection of the lines $3x + 5y = 1$ and $(2 + c)x + 5c^2y = 1$. If $\mathrm{h} = \lim_{c \to 1} x_c$ and $\mathrm{k} = \lim_{c \to 1} y_c$, then the equation of the circle is :

(A) $25x^2 + 25y^2 - 2x + 2y - 60 = 0$
(B) $5x^2 + 5y^2 - 4x + 2y - 12 = 0$
(C) $5x^2 + 5y^2 - 4x - 2y - 12 = 0$
(D) $25x^2 + 25y^2 - 20x + 2y - 60 = 0$

Answer: (D) $25x^2 + 25y^2 - 20x + 2y - 60 = 0$ · Key from source paper

Q28 JEE Main 2024 · 9 Apr · Shift 1 Numerical

Let the centre of a circle, passing through the points $(0,0),(1,0)$ and touching the circle $x^2+y^2=9$, be (h,k). Then for all possible values of the coordinates of the centre (h,k), $4\left(h^2+k^2\right)$ is equal to _____

Numerical value type: the answer is a number.

Answer: 9. · Key from source paper

Q29 JEE Main 2024 · 9 Apr · Shift 2 Numerical

Consider the circle $C: x^2+y^2=4$ and the parabola $P: y^2=8x$. If the set of all values of α, for which three chords of the circle C on three distinct lines passing through the point $(\alpha,0)$ are bisected by the parabola P is the interval (p,q), then $(2q-p)^2$ is equal to _____

Numerical value type: the answer is a number.

Answer: 80. · Key from source paper

Q30 JEE Main 2024 · 8 Apr · Shift 1 MCQ

Let the circles $C_1:(x-\alpha)^2+(y-\beta)^2=r_1^2$ and $C_2:(x-8)^2+\left(y-\frac{15}{2}\right)^2=r_2^2$ touch each other externally at the point $(6,6)$. If the point $(6,6)$ divides the line segment joining the centres of the circles C_1 and C_2 internally in the ratio 2 : 1, then $(\alpha+\beta)+4\left(r_1^2+r_2^2\right)$ equals

(A) 125
(B) 130
(C) 110
(D) 145

Answer: (B) 130 · Key from source paper

Q31 JEE Main 2024 · 5 Apr · Shift 1 MCQ

Let a circle C of radius 1 and closer to the origin be such that the lines passing through the point $(3,2)$ and parallel to the coordinate axes touch it. Then the shortest distance of the circle C from the point $(5,5)$ is :

(A) $2\sqrt{2}$
(B) $4\sqrt{2}$
(C) 4
(D) 5

Answer: (C) 4 · Key from source paper

Q32 JEE Main 2024 · 5 Apr · Shift 2 MCQ

Let $ABCD$ and $AEFG$ be squares of side 4 and 2 units, respectively. The point E is on the line segment AB and the point F is on the diagonal AC. Then the radius r of the circle passing through the

point F and touching the line segments BC and CD satisfies:

(A) $r = 0$

(B) $2r^2 - 4r + 1 = 0$

(C) $2r^2 - 8r + 7 = 0$

(D) $r^2 - 8r + 8 = 0$

Answer: (D) $r^2 - 8r + 8 = 0$ · Key from source paper

Q33 JEE Main 2024 · 5 Apr · Shift 2 MCQ

Let the circle $C_1 : x^2 + y^2 - 2(x + y) + 1 = 0$ and C_2 be a circle having centre at $(-1, 0)$ and radius 2 . If the line of the common chord of C_1 and C_2 intersects the y-axis at the point P, then the square of the distance of P from the centre of C_1 is :

(A) 2

(B) 1

(C) 4

(D) 6

Answer: (A) 2 · Key from source paper

Q34 JEE Main 2024 · 5 Apr · Shift 2 Numerical

Let the maximum and minimum values of $\left(\sqrt{8x - x^2 - 12} - 4\right)^2 + (x - 7)^2$, $x \in \mathbf{R}$ be M and m, respectively. Then $M^2 - m^2$ is equal to _____

Numerical value type: the answer is a number.

Answer: 1600. · Key from source paper

Q35 JEE Main 2024 · 4 Apr · Shift 1 MCQ

A square is inscribed in the circle $x^2 + y^2 - 10x - 6y + 30 = 0$. One side of this square is parallel to $y = x + 3$. If (x_i, y_i) are the vertices of the square, then $\boldsymbol{\Sigma}\left(x_i^2 + y_i^2\right)$ is equal to:

(A) 148

(B) 152

(C) 160

(D) 156

Answer: (B) 152 · Key from source paper

Q36 JEE Main 2024 · 4 Apr · Shift 2 MCQ

Let C be a circle with radius $\sqrt{10}$ units and centre at the origin. Let the line $x + y = 2$ intersects the circle C at the points P and Q. Let MN be a chord of C of length 2 unit and slope -1. Then, a distance (in units) between the chord PQ and the chord MN is

(A) $3-\sqrt{2}$
(B) $\sqrt{2}+1$
(C) $\sqrt{2}-1$
(D) $2-\sqrt{3}$

Answer: (A) $3-\sqrt{2}$ · Key from source paper

Q37 JEE Main 2024 · 1 Feb · Shift 1 MCQ

Let $C: x^2+y^2=4$ and $C': x^2+y^2-4\lambda x+9=0$ be two circles. If the set of all values of λ so that the circles C and C' intersect at two distinct points, is $R-a,b$, then the point $8a+12, 16b-20$ lies on the curve:

(A) $x^2+2y^2-5x+6y=3$
(B) $5x^2-y=-11$
(C) $x^2-4y^2=7$
(D) $6x^2+y^2=42$

Answer: (D) $6x^2+y^2=42$ · Key from source paper

Q38 JEE Main 2024 · 1 Feb · Shift 1 Numerical

Let the line $L: \sqrt{2}x+y=\alpha$ pass through the point of the intersection P(in the first quadrant)of the circle $x^2+y^2=3$ and the parabola $x^2=2y$. Let the line L touch two circles C_1 and C_2 of equal radius $2\sqrt{3}$. If the centres Q_1 and Q_2 of the circles C_1 and C_2 lie on the y - axis, then the square of the area of the triangle PQ_1Q_2 is equal to _____ .

Numerical value type: the answer is a number.

Answer: 72. · Key from source paper

Q39 JEE Main 2024 · 1 Feb · Shift 2 MCQ

Let the locus of the mid points of the chords of circle $x^2+y-1^2=1$ drawn from the origin intersect the line $x+y=1$ at P and Q. Then, the length of PQ is:

(A) $\frac{1}{\sqrt{2}}$
(B) $\sqrt{2}$
(C) $\frac{1}{2}$
(D) 1

Answer: (A) $\frac{1}{\sqrt{2}}$ · Key from source paper

Q40 JEE Main 2024 · 31 Jan · Shift 1 MCQ

If one of the diameters of the circle $x^2+y^2-10x+4y+13=0$ is a chord of another circle C, whose center is the point of intersection of the lines $2x+3y=12$ and $3x-2y=5$, then the radius of the circle C is

(A) $\sqrt{20}$
(B) 4
(C) 6
(D) $3\sqrt{2}$

Answer: (C) 6 · Key from source paper

Q41 JEE Main 2024 · 30 Jan · Shift 1 MCQ

If the circles $(x+1)^2+(y+2)^2=r^2$ and $x^2+y^2-4x-4y+4=0$ intersect at exactly two distinct points, then

(A) $5<\mathrm{r}<9$
(B) $0<\mathrm{r}<7$
(C) $3<r<7$
(D) $\frac{1}{2}<\mathrm{r}<7$

Answer: (C) $3<r<7$ · Key from source paper

Q42 JEE Main 2024 · 30 Jan · Shift 2 Numerical

Consider two circles $C_1: x^2+y^2=25$ and $C_2:(x-\alpha)^2+y^2=16$, where $\alpha\in(5,9)$. Let the angle between the two radii (one to each circle) drawn from one of the intersection points of C_1 and C_2 be $\sin^{-1}\frac{\sqrt{63}}{8}$. If the length of common chord of C_1 and C_2 is β, then the value of $(\alpha\beta)^2$ equals _____.

Numerical value type: the answer is a number.

Answer: 1575. · Key from source paper

Q43 JEE Main 2024 · 29 Jan · Shift 1 Numerical

Equations of two diameters of a circle are $2x-3y=5$ and $3x-4y=7$. The line joining the points $\left(-\frac{22}{7},-4\right)$ and $\left(-\frac{1}{7},3\right)$ intersects the circle at only one point $P(\alpha,\beta)$. Then $17\beta-\alpha$ is equal to

Numerical value type: the answer is a number.

Answer: 2. · Key from source paper

Q44 JEE Main 2024 · 27 Jan · Shift 1 MCQ

Four distinct points $(2k,3k)$, $(1,0)$, $(0,1)$ and $(0,0)$ lie on a circle for k equal to :

(A) $\frac{2}{13}$
(B) $\frac{3}{13}$
(C) $\frac{5}{13}$
(D) $\frac{1}{13}$

Answer: (C) $\frac{5}{13}$ · Key from source paper

Q45 JEE Main 2024 · 27 Jan · Shift 2 · Numerical

Consider a circle $x-\alpha^2+y-\beta^2=50$, where $\alpha,\beta>0$. If the circle touches the line $y+x=0$ at the point P, whose distance from the origin is $4\sqrt{2}$, then $(\alpha+\beta)^2$ is equal to _____.

Numerical value type: the answer is a number.

Answer: 100. · Key from source paper

Q46 JEE Main 2023 · 15 Apr · Shift 1 · MCQ

The number of common tangents, to the circles $x^2+y^2-18x-15y+131=0$ and $x^2+y^2-6x-6y-7=0$, is

(A) 3
(B) 1
(C) 4
(D) 2

Answer: (A) 3 · Key from source paper

Q47 JEE Main 2023 · 13 Apr · Shift 1 · MCQ

Let the tangent and normal at the point $(3\sqrt{3},1)$ on the ellipse $\frac{x^2}{36}+\frac{y^2}{4}=1$ meet the y-axis at the points A and B respectively. Let the circle C be drawn taking AB as a diameter and the line $x=2\sqrt{5}$ intersect C at points P and Q. If the tangents at the points P and Q on the circle intersect at the point (α,β), then $\alpha^2-\beta^2$ is equal to

(A) 61
(B) 60
(C) $\frac{304}{5}$
(D) $\frac{314}{5}$

Answer: (C) $\frac{304}{5}$ · Key from source paper

Q48 JEE Main 2023 · 13 Apr · Shift 2 · MCQ

Let the centre of a circle C be α, β and its radius $r<8$. Let $3x+4y=24$ and $3x-4y=32$ be two tangents and $4x+3y=1$ be a normal to C. Then $(\alpha-\beta+r)$ is equal to

(A) 7
(B) 5
(C) 6
(D) 9

Answer: (A) 7 · Key from source paper

Q49 JEE Main 2023 · 12 Apr · Shift 1 · Numerical

Two circles in the first quadrant of radii r_1 and r_2 touch the coordinate axes. Each of them cuts off an intercept of 2 units with the line $x + y = 2$. Then $r_1^2 + r_2^2 - r_1 r_2$ is equal to _____.

Numerical value type: the answer is a number.

Answer: 7. · Key from source paper

Q50 JEE Main 2023 · 10 Apr · Shift 1 · MCQ

A line segment AB of length λ moves such that the points A and B remain on the periphery of a circle of radius λ. Then the locus of the point, that divides the line segment AB in the ratio $2 : 3$, is a circle of radius

(A) $\frac{3}{5}\lambda$

(B) $\frac{2}{3}\lambda$

(C) $\frac{\sqrt{19}}{5}\lambda$

(D) $\frac{\sqrt{19}}{7}\lambda$

Answer: (C) $\frac{\sqrt{19}}{5}\lambda$ · Key from source paper

Q51 JEE Main 2023 · 10 Apr · Shift 1 · MCQ

Let the ellipse $E : x^2 + 9y^2 = 9$ intersect the positive x- and y-axes at the points A and B respectively. Let the major axis of E be a diameter of the circle C. Let the line passing through A and B meet the circle C at the point P. If the area of the triangle with vertices A, P and the origin O is $\frac{m}{n}$, where m and n are coprime, then $m - n$ is equal to

(A) 16

(B) 15

(C) 17

(D) 18

Answer: (C) 17 · Key from source paper

Q52 JEE Main 2023 · 8 Apr · Shift 1 · Numerical

Consider a circle $C_1 : x^2 + y^2 - 4x - 2y = \alpha - 5$. Let its mirror image in the line $y = 2x + 1$ be another circle $C_2 : 5x^2 + 5y^2 - 10fx - 10gy + 36 = 0$. Let r be the radius of C_2. Then $\alpha + r$ is equal to _____

Numerical value type: the answer is a number.

Answer: 2. · Key from source paper

Q53 JEE Main 2023 · 8 Apr · Shift 2 · MCQ

Let O be the origin and OP and OQ be the tangents to the circle $x^2 + y^2 - 6x + 4y + 8 = 0$ at the points P and Q on it. If the circumcircle of the triangle OPQ passes through the point $\left(\alpha, \frac{1}{2}\right)$, then a

value of α is

(A) $\frac{3}{2}$
(B) $-\frac{1}{2}$
(C) $\frac{5}{2}$
(D) 1

Answer: (C) $\frac{5}{2}$ · Key from source paper

Q54 JEE Main 2023 · 6 Apr · Shift 1 · Numerical

A circle passing through the point $P(\alpha, \beta)$ in the first quadrant touches the two coordinate axes at the points A and B. The point P is above the line AB. The point Q on the line segment AB is the foot of perpendicular from P on AB. If PQ is equal to 11 units, then the value of $\alpha\beta$ is _____ .

Numerical value type: the answer is a number.

Answer: 121. · Key from source paper

Q55 JEE Main 2023 · 6 Apr · Shift 1 · Numerical

Let the point $(p, p+1)$ lie inside the region $E = \{(x, y) : 3 - x \leq y \leq \sqrt{9 - x^2},\ 0 \leq x \leq 3\}$. If the set of all values of p is the interval (a, b), then $b^2 + b - a^2$ is equal to _____ .

Numerical value type: the answer is a number.

Answer: 3. · Key from source paper

Q56 JEE Main 2023 · 6 Apr · Shift 2 · MCQ

If the tangents at the points P and Q on the circle $x^2 + y^2 - 2x + y = 5$ meet at the point $R\left(\frac{9}{4}, 2\right)$, then the area of the triangle PQR is

(A) $\frac{5}{4}$
(B) $\frac{13}{8}$
(C) $\frac{5}{8}$
(D) $\frac{13}{4}$

Answer: (C) $\frac{5}{8}$ · Key from source paper

Q57 JEE Main 2023 · 31 Jan · Shift 1 · MCQ

Let a circle C_1 be obtained on rolling the circle $x^2 + y^2 - 4x - 6y + 11 = 0$ upwards 4 units on the tangent T to it at the point 3, 2. Let C_2 be the image of C_1 in T. Let A and B be the centers of circles C_1 and C_2 respectively, and M and N be respectively the feet of perpendiculars drawn from A and B on the x-axis. Then the area of trapezium AMNB is:

(A) $22+\sqrt{2}$
(B) $41+\sqrt{2}$
(C) $3+2\sqrt{2}$
(D) $21+\sqrt{2}$

Answer: (B) $41+\sqrt{2}$ · Key from source paper

Q58 JEE Main 2023 · 31 Jan · Shift 2 MCQ

The set of all values of a^2 for which the line $x+y=0$ bisects two distinct chords drawn from a point $\mathrm{P}\left(\frac{1+a}{2}, \frac{1-a}{2}\right)$ on the circle $2x^2+2y^2-(1+a)x-(1-a)y=0$, is equal to :

(A) $(8,\infty)$
(B) $(0,4]$
(C) $(4,\infty)$
(D) $(2,12]$

Answer: (A) $(8,\infty)$ · Key from source paper

Q59 JEE Main 2023 · 30 Jan · Shift 1 MCQ

Let $y=x+2$, $4y=3x+6$ and $3y=4x+1$ be three tangent lines to the circle $(x-h)^2+(y-k)^2=r^2$. Then $h+k$ is equal to :

(A) 5
(B) $5\left(1+\sqrt{2}\right)$
(C) 6
(D) $5\sqrt{2}$

Answer: (A) 5 · Key from source paper

Q60 JEE Main 2023 · 30 Jan · Shift 2 Numerical

Let $P(a_1,b_1)$ and $Q(a_2,b_2)$ be two distinct points on a circle with center $C\left(\sqrt{2},\sqrt{3}\right)$. Let O be the origin and OC be perpendicular to both CP and CQ. If the area of the triangle OCP is $\frac{\sqrt{35}}{2}$, then $a_1^2+a_2^2+b_1^2+b_2^2$ is equal to _____ .

Numerical value type: the answer is a number.

Answer: 24. · Key from source paper

Q61 JEE Main 2023 · 29 Jan · Shift 1 MCQ

Let the tangents at the points $A(4,-11)$ and $B(8,-5)$ on the circle $x^2+y^2-3x+10y-15=0$, intersect at the point C. Then the radius of the circle, whose centre is C and the line joining A and B is its tangent, is equal to

(A) $\frac{3\sqrt{3}}{4}$
(B) $2\sqrt{13}$
(C) $\sqrt{13}$
(D) $\frac{2\sqrt{13}}{3}$

Answer: (D) $\frac{2\sqrt{13}}{3}$ · Key from source paper

Q62 JEE Main 2023 · 29 Jan · Shift 2 Numerical

A circle with centre $(2, 3)$and radius 4 intersects the line $x + y = 3$ at the points P and Q. If the tangents at P and Q intersect at the point $S(\alpha, \beta)$, then $4\alpha - 7\beta$ is equal to

Numerical value type: the answer is a number.

Answer: 11. · Key from source paper

Q63 JEE Main 2023 · 25 Jan · Shift 1 MCQ

The points of intersection of the line $ax + by = 0$, $(\mathrm{a} \neq \mathrm{b})$ and the circle $\mathrm{x}^2 + \mathrm{y}^2 - 2\mathrm{x} = 0$ are $A(\alpha, 0)$ and $B(1, \beta)$. The image of the circle with AB as a diameter in the line $\mathrm{x} + \mathrm{y} + 2 = 0$ is :

(A) $x^2 + y^2 + 5x + 5y + 12 = 0$
(B) $x^2 + y^2 + 3x + 5y + 8 = 0$
(C) $x^2 + y^2 + 3x + 3y + 4 = 0$
(D) $x^2 + y^2 - 5x - 5y + 12 = 0$

Answer: (A) $x^2 + y^2 + 5x + 5y + 12 = 0$ · Key from source paper

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Q64 JEE Main 2023 · 25 Jan · Shift 2 Numerical

Points $P(-3, 2)$, $Q(9, 10)$ and $R(\alpha, 4)$ lie on a circle C with PR as its diameter. The tangents to C at the points Q and R intersect at the point S. If S lies on the line $2x - ky = 1$, then k is equal to _____ .

Numerical value type: the answer is a number.

Answer: 3. · Key from source paper

Q65 JEE Main 2023 · 24 Jan · Shift 2 MCQ

The locus of the middle points of the chords of the circle $C_1 : (x - 4)^2 + (y - 5)^2 = 4$ which subtend an angle θ_i at the centre of the circle C_i, is a circle of radius r_i. If $\theta_1 = \frac{\pi}{3}$, $\theta_3 = \frac{2\pi}{3}$ and $r_1^2 = r_2^2 + r_3^2$, then θ_2 is equal to

(A) $\frac{\pi}{4}$
(B) $\frac{3\pi}{4}$
(C) $\frac{\pi}{6}$
(D) $\frac{\pi}{2}$

Answer: (D) $\frac{\pi}{2}$ · Key from source paper

Q66 JEE Main 2022 · 29 Jul · Shift 1 · Numerical

Let the mirror image of a circle $c_1 : x^2 + y^2 - 2x - 6y + \alpha = 0$ in line $y = x + 1$ be $c_2 : 5x^2 + 5y^2 + 10gx + 10fy + 38 = 0$. If r is the radius of circle c_2, then $\alpha + 6r^2$ is equal to _____.

Numerical value type: the answer is a number.

Answer: 12. · Key from source paper

Q67 JEE Main 2022 · 29 Jul · Shift 2 · Numerical

Let AB be a chord of length 12 of the circle $x - 2^2 + y + 1^2 = \frac{169}{4}$
If tangents drawn to the circle at points A and B intersect at the point P, then five times the distance of point P from chord AB is equal to _____.

Numerical value type: the answer is a number.

Answer: 72. · Key from source paper

Q68 JEE Main 2022 · 28 Jul · Shift 1 · MCQ

Let C be the centre of the circle $x^2 + y^2 - x + 2y = \frac{11}{4}$ and P be a point on the circle. A line passes through the point C, makes an angle of $\frac{\pi}{4}$ with the line CP and intersects the circle at the points Q and R. Then the area of the triangle PQR (in unit^2) is

(A) 2
(B) $2\sqrt{2}$
(C) $8\sin\frac{\pi}{8}$
(D) $8\cos\frac{\pi}{8}$

Answer: (B) $2\sqrt{2}$ · Key from source paper

Q69 JEE Main 2022 · 28 Jul · Shift 2 · MCQ

Let the tangents at two points A and B on the circle $x^2 + y^2 - 4x + 3 = 0$ meet at origin $O(0, 0)$. Then the area of the triangle OAB is

(A) $\frac{3\sqrt{3}}{2}$
(B) $\frac{3\sqrt{3}}{4}$
(C) $\frac{3}{2\sqrt{3}}$
(D) $\frac{3}{4\sqrt{3}}$

Answer: (B) $\frac{3\sqrt{3}}{4}$ · Key from source paper

Q70 JEE Main 2022 · 27 Jul · Shift 1 · MCQ

If the circle $x^2 + y^2 - 2gx + 6y - 19c = 0$, $g, c \in \mathbb{R}$ passes through the point $(6, 1)$ and its centre lies on the line $x - 2cy = 8$, then the length of intercept made by the circle on x-axis is

(A) $\sqrt{11}$
(B) 4
(C) 3
(D) $2\sqrt{23}$

Answer: (D) $2\sqrt{23}$ · Key from source paper

Q71 JEE Main 2022 · 27 Jul · Shift 2 MCQ

A circle C_1 passes through the origin O and has diameter 4 on the positive x-axis. The line $y = 2x$ gives a chord OA of a circle C_1. Let C_2 be the circle with OA as a diameter. If the tangent to C_2 at the point A meets the x-axis at P and y-axis at Q, then $QA : AP$ is equal to

(A) $1 : 4$
(B) $1 : 5$
(C) $2 : 5$
(D) $1 : 3$

Answer: (A) $1 : 4$ · Key from source paper

Q72 JEE Main 2022 · 26 Jul · Shift 1 MCQ

A point P moves so that the sum of squares of its distances from the points $(1, 2)$ and $(-2, 1)$ is 14. Let $f(x, y) = 0$ be the locus of P, which intersects the x-axis at the points A, B and the y-axis at the point C, D. Then the area of the quadrilateral $ACBD$ is equal to

(A) $\frac{9}{2}$
(B) $\frac{3\sqrt{17}}{2}$
(C) $\frac{3\sqrt{17}}{4}$
(D) 9

Answer: (B) $\frac{3\sqrt{17}}{2}$ · Key from source paper

Q73 JEE Main 2022 · 26 Jul · Shift 2 MCQ

Let the abscissae of the two points P and Q on a circle be the roots of $x^2 - 4x - 6 = 0$ and the ordinates of P and Q be the roots of $y^2 + 2y - 7 = 0$. If PQ is a diameter of the circle $x^2 + y^2 + 2ax + 2by + c = 0$, then the value of $a + b - c$ is

(A) 12
(B) 13
(C) 14
(D) 16

Answer: (A) 12 · Key from source paper

Q74 JEE Main 2022 · 25 Jul · Shift 1 MCQ

Let the locus of the centre $\alpha, \beta, \beta > 0$, of the circle which touches the circle $x^2 + y - 1^2 = 1$ externally and also touches the x-axis be L. Then the area bounded by L and the line $y = 4$ is

(A) $\frac{32\sqrt{2}}{3}$

(B) $\frac{40\sqrt{2}}{3}$

(C) $\frac{64}{3}$

(D) $\frac{32}{3}$

Answer: (C) $\frac{64}{3}$ · Key from source paper

Q75 JEE Main 2022 · 25 Jul · Shift 2 Numerical

If the circles $x^2 + y^2 + 6x + 8y + 16 = 0$ and $x^2 + y^2 + 2\left(3 - \sqrt{3}\right)x + 2\left(4 - \sqrt{6}\right)y = k + 6\sqrt{3} + 8\sqrt{6}$, $k > 0$, touch internally at the point $P(\alpha, \beta)$, then $\left(\alpha + \sqrt{3}\right)^2 + \left(\beta + \sqrt{6}\right)^2$ is equal to _____.

Numerical value type: the answer is a number.

Answer: 25. · Key from source paper

Q76 JEE Main 2022 · 29 Jun · Shift 1 MCQ

Let the tangent to the circle $C_1 : x^2 + y^2 = 2$ at the point $M(-1, 1)$ intersect the circle $C_2 : (x - 3)^2 + (y - 2)^2 = 5$, at two distinct points A and B. If the tangents to C_2 at the points A and B intersect at N, then the area of the triangle ANB is equal to

(A) $\frac{1}{2}$

(B) $\frac{2}{3}$

(C) $\frac{1}{6}$

(D) $\frac{5}{3}$

Answer: (C) $\frac{1}{6}$ · Key from source paper

Q77 JEE Main 2022 · 29 Jun · Shift 2 MCQ

Let a triangle ABC be inscribed in the circle $x^2 - \sqrt{2}(x + y) + y^2 = 0$ such that $\angle BAC = \frac{\pi}{2}$. If the length of side AB is $\sqrt{2}$, then the area of the $\triangle ABC$ is equal to:

(A) 1

(B) $\frac{(\sqrt{6}+\sqrt{3})}{2}$

(C) $\frac{(\sqrt{3}+\sqrt{3})}{2}$

(D) $\frac{(\sqrt{6}+2\sqrt{3})}{4}$

Answer: (A) 1 · Key from source paper

Q78 JEE Main 2022 · 28 Jun · Shift 1 MCQ

If the tangents drawn at the point $O(0,0)$ and $P\left(1+\sqrt{5}, 2\right)$ on the circle $x^2+y^2-2x-4y=0$ intersect at the point Q, then the area of the triangle OPQ is equal to

(A) $\frac{3+\sqrt{5}}{2}$

(B) $\frac{4+2\sqrt{5}}{2}$

(C) $\frac{5+3\sqrt{5}}{2}$

(D) $\frac{7+3\sqrt{5}}{2}$

Answer: (C) $\frac{5+3\sqrt{5}}{2}$ · Key from source paper

Q79 JEE Main 2022 · 28 Jun · Shift 1 Numerical

Let the lines $y+2x=\sqrt{11}+7\sqrt{7}$ and $2y+x=2\sqrt{11}+6\sqrt{7}$ be normal to a circle $C:(x-h)^2+(y-k)^2=r^2$. If the line $\sqrt{11}y-3x=\frac{5\sqrt{77}}{3}+11$ is tangent to the circle C, then the value of $(5h-8k)^2+5r^2$ is equal to _____.

Numerical value type: the answer is a number.

Answer: 816. · Key from source paper

Q80 JEE Main 2022 · 28 Jun · Shift 2 Numerical

If one of the diameters of the circle $x^2+y^2-2\sqrt{2}x-6\sqrt{2}y+14=0$ is a chord of the circle $\left(x-2\sqrt{2}\right)^2+\left(y-2\sqrt{2}\right)^2=r^2$, then the value of r^2 is equal to

Numerical value type: the answer is a number.

Answer: 10. · Key from source paper

Q81 JEE Main 2022 · 27 Jun · Shift 1 Numerical

A rectangle R with end points of the one of its sides as $(1,2)$ and $(3,6)$ is inscribed in a circle. If the equation of a diameter of the circle is $2x-y+4=0$, then the area of R is _____ .

Numerical value type: the answer is a number.

Answer: 16. · Key from source paper

Q82 JEE Main 2022 · 27 Jun · Shift 1 Numerical

A circle of radius 2 unit passes through the vertex and the focus of the parabola $y^2 = 2x$ and touches the parabola $y = \left(x - \frac{1}{4}\right)^2 + \alpha$, where $\alpha > 0$. Then $(4\alpha - 8)^2$ is equal to _____ .

Numerical value type: the answer is a number.

Answer: 63. · Key from source paper

Q83 JEE Main 2022 · 27 Jun · Shift 2 MCQ

The set of values of k for which the circle $C : 4x^2 + 4y^2 - 12x + 8y + k = 0$ lies inside the fourth quadrant and the point $\left(1, -\frac{1}{3}\right)$ lies on or inside the circle C is

(A) An empty set
(B) $\left(6, \frac{95}{9}\right]$
(C) $\left[\frac{80}{9}, 10\right)$
(D) $\left(9, \frac{92}{9}\right]$

Answer: (D) $\left(9, \frac{92}{9}\right]$ · Key from source paper

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Q84 JEE Main 2022 · 27 Jun · Shift 2 Numerical

Let a circle C of radius 5 lie below the x-axis. The line $L_1 = 4x + 3y + 2$ passes through the centre P of the circle C and intersects the line $L_2 : 3x - 4y - 11 = 0$ at Q. The line L_2 touches C at the point Q. Then the distance of P from the line $5x - 12y + 51 = 0$ is

Numerical value type: the answer is a number.

Answer: 11. · Key from source paper

Q85 JEE Main 2022 · 26 Jun · Shift 1 MCQ

Let C be a circle passing through the points $A(2, -1)$ and $B(3, 4)$. The line segment AB is not a diameter of C. If r is the radius of C and its centre lies on the circle $(x - 5)^2 + (y - 1)^2 = \frac{13}{2}$, then r^2 is equal to

(A) 32
(B) $\frac{65}{2}$
(C) $\frac{61}{2}$
(D) 30

Answer: (B) $\frac{65}{2}$ · Key from source paper

Q86 JEE Main 2022 · 25 Jun · Shift 1 MCQ

Let a circle C touch the lines $L_1 : 4x - 3y + K_1 = 0$ and $L_2 : 4x - 3y + K_2 = 0$, $K_1, K_2 \in R$. If a line passing through the centre of the circle C intersects L_1 at $-1, 2$ and L_2 at $3, -6$, then the equation of the circle C is

(A) $x - 1^2 + y - 2^2 = 4$
(B) $x - 1^2 + y + 2^2 = 16$
(C) $x + 1^2 + y - 2^2 = 4$
(D) $x - 1^2 + y - 2^2 = 16$

Answer: (B) $x - 1^2 + y + 2^2 = 16$ · Key from source paper

Q87 JEE Main 2022 · 25 Jun · Shift 1 Numerical

Let the abscissae of the two points P and Q be the roots of $2x^2 - rx + p = 0$ and the ordinates of P and Q be the roots of $x^2 - sx - q = 0$. If the equation of the circle described on PQ as diameter is $2\left(x^2 + y^2\right) - 11x - 14y - 22 = 0$, then $2r + s - 2q + p$ is equal to _____ .

Numerical value type: the answer is a number.

Answer: 7. · Key from source paper

Q88 JEE Main 2022 · 25 Jun · Shift 2 MCQ

A circle touches both the y-axis and the line $x + y = 0$. Then the locus of its center

(A) $y = \sqrt{2}x$
(B) $x = \sqrt{2}y$..
(C) $y^2 - x^2 = 2xy$
(D) $x^2 - y^2 = 2xy$

Answer: (D) $x^2 - y^2 = 2xy$ · Key from source paper

Q89 JEE Main 2022 · 24 Jun · Shift 1 MCQ

Let $x^2 + y^2 + Ax + By + C = 0$ be a circle passing through $(0, 6)$ and touching the parabola $y = x^2$ at $(2, 4)$. Then $A + C$ is equal to _____

(A) 16
(B) $\frac{88}{5}$
(C) 72
(D) -8

Answer: (A) 16 · Key from source paper

Q90 JEE Main 2022 · 24 Jun · Shift 2 Numerical

Let a circle $C : (x-h)^2+(y-k)^2=r^2$, $k>0$, touch the x-axis at $(1,0)$. If the line $x+y=0$ intersects the circle C at P and Q such that the length of the chord PQ is 2, then the value of $h+k+r$ is equal to _____ .

Numerical value type: the answer is a number.

Answer: 7. · Key from source paper

Q91 JEE Main 2021 · 31 Aug · Shift 1 Numerical

If the variable line $3x+4y=\alpha$ lies between the two circles $(x-1)^2+(y-1)^2=1$ and $(x-9)^2+(y-1)^2=4$, without intercepting a chord on either circle, then the sum of all the integral values of α is _____

Numerical value type: the answer is a number.

Answer: 165. · Key from source paper

Q92 JEE Main 2021 · 31 Aug · Shift 2 Numerical

Let B be the centre of the circle $x^2+y^2-2x+4y+1=0$. Let the tangents at two points P and Q on the circle intersect at the point $A(3,1)$. Then $8\frac{\text{area }\Delta APQ}{\text{area }\Delta BPQ}$ is equal to _____.

Numerical value type: the answer is a number.

Answer: 18. · Key from source paper

Q93 JEE Main 2021 · 27 Aug · Shift 1 Numerical

Let the equation $x^2+y^2+px+(1-p)y+5=0$ represent circles of varying radius $r\in(0,5]$. Then the number of elements in the set $S=\{q : q=p^2 \text{ and } q \text{ is an integer}\}$ is _____

Numerical value type: the answer is a number.

Answer: 61. · Key from source paper

Q94 JEE Main 2021 · 27 Aug · Shift 2 Numerical

Two circles each of radius 5 units touch each other at the point $(1,2)$. If the equation of their common tangent is $4x+3y=10$, and $C_1(\alpha,\beta)$ and $C_2(\gamma,\delta)$, $C_1\neq C_2$ are their centres, then $|(\alpha+\beta)(\gamma+\delta)|$ is equal to

Numerical value type: the answer is a number.

Answer: 40. · Key from source paper

Q95 JEE Main 2021 · 26 Aug · Shift 1 Numerical

The locus of a point, which moves such that the sum of squares of its distances from the points $(0,0),(1,0),(0,1)(1,1)$ is 18 units, is a circle of diameter d. Then d^2 is equal to

Numerical value type: the answer is a number.

Answer: 16. · Key from source paper

Q96 JEE Main 2021 · 26 Aug · Shift 2 MCQ

A circle C touches the line $x = 2y$ at the point $(2, 1)$ and intersects the circle $C_1 : x^2 + y^2 + 2y - 5 = 0$ at two points P and Q such that PQ is a diameter of C_1. Then the diameter of C is :

(A) $4\sqrt{15}$
(B) $\sqrt{285}$
(C) 15
(D) $7\sqrt{5}$

Answer: (D) $7\sqrt{5}$ · Key from source paper

Q97 JEE Main 2021 · 27 Jul · Shift 1 MCQ

Two tangents are drawn from the point $P(-1, 1)$ to the circle $x^2 + y^2 - 2x - 6y + 6 = 0$. If these tangents touch the circle at points A and B, and if D is a point on the circle such that length of the segments AB and AD are equal, then the area of the triangle ABD is equal to:

(A) 2
(B) $(3\sqrt{2} + 2)$
(C) 4
(D) $3(\sqrt{2} - 1)$

Answer: (C) 4 · Key from source paper

Q98 JEE Main 2021 · 27 Jul · Shift 1 MCQ

Let P and Q be two distinct points on a circle which has center at $C(2, 3)$ and which passes through origin O. If OC is perpendicular to both the line segments CP and CQ, then the set $\{P, Q\}$ is equal to

(A) $\{(4, 0), (0, 6)\}$
(B) $\left\{\left(2 + 2\sqrt{2}, 3 - \sqrt{5}\right), \left(2 - 2\sqrt{2}, 3 + \sqrt{5}\right)\right\}$
(C) $\left\{\left(2 + 2\sqrt{2}, 3 + \sqrt{5}\right), \left(2 - 2\sqrt{2}, 3 - \sqrt{5}\right)\right\}$
(D) $\{(-1, 5), (5, 1)\}$

Answer: (D) $\{(-1, 5), (5, 1)\}$ · Key from source paper

Q99 JEE Main 2021 · 27 Jul · Shift 1 MCQ

Let
$A = \{(x, y) \in R \times R \mid 2x^2 + 2y^2 - 2x - 2y = 1\}$
$B = \{(x, y) \in R \times R \mid 4x^2 + 4y^2 - 16y + 7 = 0\}$ and

$C = \{(x, y) \in R \times R \mid x^2 + y^2 - 4x - 2y + 5 \leq r^2\}$. Then the minimum value of $|r|$ such that $A \cup B \subseteq C$ is equal to

(A) $\frac{3+\sqrt{10}}{2}$
(B) $\frac{2+\sqrt{10}}{2}$
(C) $\frac{3+2\sqrt{5}}{2}$
(D) $1 + \sqrt{5}$

Answer: (C) $\frac{3+2\sqrt{5}}{2}$ · Key from source paper

Q100 JEE Main 2021 · 27 Jul · Shift 2 MCQ

Consider a circle C which touches the $y-$ axis at $(0, 6)$ and cuts off an intercept $6\sqrt{5}$ on the $x-$ axis. Then the radius of the circle C is equal to :

(A) $\sqrt{53}$
(B) 9
(C) 8
(D) $\sqrt{82}$

Answer: (B) 9 · Key from source paper

Q101 JEE Main 2021 · 22 Jul · Shift 1 MCQ

Let the circle $S : 36x^2 + 36y^2 - 108x + 120y + C = 0$ be such that it neither intersects nor touches the co-ordinate axes. If the point of intersection of the lines, $x - 2y = 4$ and $2x - y = 5$ lies inside the circle S, then:

(A) $\frac{25}{9} < C < \frac{13}{3}$
(B) $100 < C < 165$
(C) $81 < C < 156$
(D) $100 < C < 156$

Answer: (D) $100 < C < 156$ · Key from source paper

Q102 JEE Main 2021 · 20 Jul · Shift 2 MCQ

Let r_1 and r_2 be the radii of the largest and smallest circles, respectively, which pass through the point $(-4, 1)$ and having their centres on the circumference of the circle $x^2 + y^2 + 2x + 4y - 4 = 0$. If $\frac{r_1}{r_2} = a + b\sqrt{2}$, then $a + b$ is equal to:

(A) 3
(B) 11
(C) 5
(D) 7

Answer: (C) 5 · Key from source paper

Q103 JEE Main 2021 · 18 Mar · Shift 1 MCQ

Choose the correct statement about two circles whose equations are given below:
$x^2 + y^2 - 10x - 10y + 41 = 0$
$x^2 + y^2 - 22x - 10y + 137 = 0$

(A) circles have same centre
(B) circles have no meeting point
(C) circles have only one meeting point
(D) circles have two meeting points

Answer: (C) circles have only one meeting point · Key from source paper

Q104 JEE Main 2021 · 18 Mar · Shift 1 MCQ

For the four circles M, N, O and P, following four equations are given:
Circle $M : x^2 + y^2 = 1$
Circle $N : x^2 + y^2 - 2x = 0$
Circle $O : x^2 + y^2 - 2x - 2y + 1 = 0$
Circle $P : x^2 + y^2 - 2y = 0$
If the centre of circle M is joined with centre of the circle N, further centre of circle N is joined with centre of the circle O, centre of circle O is joined with the centre of circle P and lastly, centre of circle P is joined with centre of circle M, then these lines form the sides of a

(A) Rhombus
(B) Square
(C) Rectangle
(D) Parallelogram

Answer: (B) Square · Key from source paper

Q105 JEE Main 2021 · 17 Mar · Shift 1 MCQ

The line $2x - y + 1 = 0$ is a tangent to the circle at the point $(2, 5)$ and the centre of the circle lies on $x - 2y = 4$. Then, the radius of the circle is:

(A) $3\sqrt{5}$
(B) $5\sqrt{3}$
(C) $5\sqrt{4}$
(D) $4\sqrt{5}$

Answer: (A) $3\sqrt{5}$ · Key from source paper

Q106 JEE Main 2021 · 17 Mar · Shift 1 MCQ

Choose the incorrect statement about the two circles whose equations are given below:
$x^2 + y^2 - 10x - 10y + 41 = 0$ and $x^2 + y^2 - 16x - 10y + 80 = 0$

(A) Distance between two centres is the average of radii of both the circles.
(B) Both circles' centres lie inside region of one another.
(C) Both circles pass through the centre of each other.
(D) Circles have two intersection points.

Answer: (B) Both circles' centres lie inside region of one another. · Key from source paper

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Q107 JEE Main 2021 · 17 Mar · Shift 1 Numerical

The minimum distance between any two points P_1 and P_2 while considering point P_1 on one circle and point P_2 on the other circle for the given circles' equations
$x^2 + y^2 - 10x - 10y + 41 = 0$
$x^2 + y^2 - 24x - 10y + 160 = 0$ is _____.

Numerical value type: the answer is a number.

Answer: 1. · Key from source paper

Q108 JEE Main 2021 · 17 Mar · Shift 2 MCQ

Two tangents are drawn from a point P to the circle $x^2 + y^2 - 2x - 4y + 4 = 0$, such that the angle between these tangents is $\tan^{-1}\left(\frac{12}{5}\right)$, where $\tan^{-1}\left(\frac{12}{5}\right) \in (0, \pi)$. If the centre of the circle is denoted by C and these tangents touch the circle at points A and B, then the ratio of the areas of $\triangle PAB$ and $\triangle CAB$ is :

(A) $11 : 4$
(B) $9 : 4$
(C) $3 : 1$
(D) $2 : 1$

Answer: (B) $9 : 4$ · Key from source paper

Q109 JEE Main 2021 · 17 Mar · Shift 2 MCQ

Let the tangent to the circle $x^2 + y^2 = 25$ at the point $R(3, 4)$ meet x -axis and y-axis at point P and Q, respectively. If r is the radius of the circle passing through the origin O and having centre at the incentre of the triangle OPQ, then r^2 is equal to

(A) $\frac{529}{64}$
(B) $\frac{125}{72}$
(C) $\frac{625}{72}$
(D) $\frac{585}{66}$

Answer: (C) $\frac{625}{72}$ · Key from source paper

Q110 JEE Main 2021 · 16 Mar · Shift 1 Numerical

Let $ABCD$ be a square of side of unit length. Let a circle C_1 centered at A with unit radius is drawn. Another circle C_2 which touches C_1 and the lines AD and AB are tangent to it, is also drawn. Let a tangent line from the point C to the circle C_2 meet the side AB at E. If the length of EB is $\alpha + \sqrt{3}\beta$, where α, β are integers, then $\alpha + \beta$ is equal to _____.

Numerical value type: the answer is a number.

Answer: 1. · Key from source paper

Q111 JEE Main 2021 · 16 Mar · Shift 2 MCQ

Let the lengths of intercepts on x-axis and y-axis made by the circle $x^2 + y^2 + ax + 2ay + c = 0$, $(a < 0)$ be $2\sqrt{2}$ and $2\sqrt{5}$, respectively. Then the shortest distance from origin to a tangent to this circle which is perpendicular to the line $x + 2y = 0$, is equal to :

(A) $\sqrt{11}$

(B) $\sqrt{7}$

(C) $\sqrt{6}$

(D) $\sqrt{10}$

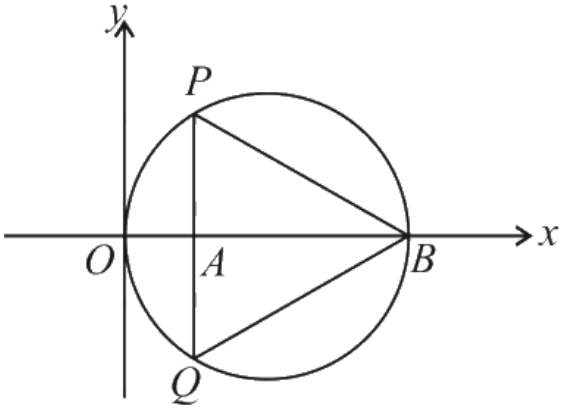
Answer: (C) $\sqrt{6}$ · Key from source paper

Q112 JEE Main 2021 · 26 Feb · Shift 1 MCQ

In the circle given below, let $OA = 1$ unit, $OB = 13$ unit and $PQ \perp OB$. Then, the area of the triangle PQB (in square units) is :

(see the figure above)

Q66. In the circle given below, let $OA = 1$ unit, $OB = 13$ unit and $PQ \perp OB$. Then, the area of the triangle PQB



(in square units) is :

(1) $24\sqrt{3}$

(2) $26\sqrt{3}$

(3) $24\sqrt{2}$

(4) $26\sqrt{2}$

(A) $24\sqrt{3}$
(B) $26\sqrt{3}$
(C) $24\sqrt{2}$
(D) $26\sqrt{2}$

Answer: (A) $24\sqrt{3}$ · Key from source paper

Q113 JEE Main 2021 · 26 Feb · Shift 2 MCQ

If the locus of the mid-point of the line segment from the point $(3, 2)$ to a point on the circle, $x^2 + y^2 = 1$ is a circle of radius r, then r is equal to

(A) $\frac{1}{4}$
(B) 1
(C) $\frac{1}{3}$
(D) $\frac{1}{2}$

Answer: (D) $\frac{1}{2}$ · Key from source paper

Q114 JEE Main 2021 · 26 Feb · Shift 2 MCQ

Let $A(1, 4)$ and $B(1, -5)$ be two points. Let P be a point on the circle $((x-1))^2 + (y-1)^2 = 1$, such that $(PA)^2 + (PB)^2$ have maximum value, then the points, P, A and B lie on

(A) a hyperbola
(B) a straight line
(C) an ellipse
(D) a parabola

Answer: (B) a straight line · Key from source paper

Q115 JEE Main 2021 · 26 Feb · Shift 2 Numerical

Let the normals at all the points on a given curve pass through a fixed point (a, b). If the curve passes through $(3, -3)$ and $\left(4, -2\sqrt{2}\right)$, given that $a - 2\sqrt{2}\,b = 3$, then $(a^2 + b^2 + ab)$ is equal to _____.

Numerical value type: the answer is a number.

Answer: 9. · Key from source paper

Q116 JEE Main 2021 · 24 Feb · Shift 1 Numerical

If one of the diameters of the circle $x^2 + y^2 - 2x - 6y + 6 = 0$ is a chord of another circle 'C', whose center is at $2, 1$, then its radius is _____.

Numerical value type: the answer is a number.

Answer: 3. · Key from source paper

Q117 JEE Main 2021 · 24 Feb · Shift 2 Numerical

Let a point P be such that its distance from the point $(5, 0)$ is thrice the distance of P from the point $(-5, 0)$. If the locus of the point P is a circle of radius r, then $4r^2$ (in the nearest integer) is equal to _____.

Numerical value type: the answer is a number.

Answer: 56. · Key from source paper

Q118 JEE Main 2021 · 24 Feb · Shift 2 Numerical

If the area of the triangle formed by the x-axis, the normal and the tangent to the circle $(x-2)^2+(y-3)^2=25$ at the point $(5, 7)$ is A, then $24A$ is equal to _____.

Numerical value type: the answer is a number.

Answer: 1225. · Key from source paper

Q119 JEE Main 2020 · 6 Sep · Shift 2 MCQ

The centre of the circle passing through the point $(0, 1)$ and touching the parabola $y = x^2$ at the point $(2, 4)$ is :

(A) $\left(\frac{-53}{10}, \frac{16}{5}\right)$
(B) $\left(\frac{6}{5}, \frac{53}{10}\right)$
(C) $\left(\frac{3}{10}, \frac{16}{5}\right)$
(D) $\left(\frac{-16}{5}, \frac{53}{10}\right)$

Answer: (D) $\left(\frac{-16}{5}, \frac{53}{10}\right)$ · Key from source paper

Q120 JEE Main 2020 · 5 Sep · Shift 2 MCQ

If the length of the chord of the circle, $x^2+y^2=r^2(r>0)$ along the line, $y-2x=3$ is r, then r^2 is equal to:

(A) $\frac{9}{5}$
(B) 12
(C) $\frac{24}{5}$
(D) $\frac{12}{5}$

Answer: (D) $\frac{12}{5}$ · Key from source paper

Q121 JEE Main 2020 · 4 Sep · Shift 2 MCQ

The circle passing through the intersection of the circles, $x^2+y^2-6x=0$ and $x^2+y^2-4y=0$ having its centre on the line, $2x-3y+12=0$, also passes through the point :

(A) $(-1, 3)$
(B) $(-3, 6)$
(C) $(-3, 1)$
(D) $(1, -3)$

Answer: (B) $(-3, 6)$ · Key from source paper

Q122 JEE Main 2020 · 4 Sep · Shift 2 Numerical

Let PQ be a diameter of the circle $x^2 + y^2 = 9$. If α and β are the lengths of the perpendiculars from P and Q on the straight line, $x + y = 2$ respectively, then the maximum value of $\alpha\beta$ is _____

Numerical value type: the answer is a number.

Answer: 7. · Key from source paper

Q123 JEE Main 2020 · 3 Sep · Shift 1 Numerical

The diameter of the circle, whose Centre lies on the line $x + y = 2$ in the first quadrant and which touches both the lines $x = 3$ and $y = 2$ is

Numerical value type: the answer is a number.

Answer: 3. · Key from source paper

Q124 JEE Main 2020 · 3 Sep · Shift 2 MCQ

Let the latus rectum of the parabola $y^2 = 4x$ be the common chord to the circles C_1 and C_2 each of them having radius $2\sqrt{5}$. Then, the distance between the centres of the circles C_1 and C_2 is :

(A) 12
(B) 8
(C) $8\sqrt{5}$
(D) $4\sqrt{5}$

Answer: (B) 8 · Key from source paper

Q125 JEE Main 2020 · 2 Sep · Shift 1 Numerical

The numbers of integral values of k for which the line, $3x + 4y = k$ intersects the circle, $x^2 + y^2 - 2x - 4y + 4 = 0$ at two distinct points is....

Numerical value type: the answer is a number.

Answer: 9. · Key from source paper

Q126 JEE Main 2020 · 9 Jan · Shift 1 MCQ

A circle touches the y-axis at the point $(0, 4)$ and passes through the point $(2, 0)$. Which of the following lines is not a tangent to this circle?

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(A) $4x - 3y + 17 = 0$
(B) $3x - 4y - 24 = 0$
(C) $3x + 4y - 6 = 0$
(D) $4x + 3y - 8 = 0$

Answer: (D) $4x + 3y - 8 = 0$ · Key from source paper

Q127 JEE Main 2020 · 9 Jan · Shift 2 Numerical

If the curves, $x^2 - 6x + y^2 + 8 = 0$ and $x^2 - 8y + y^2 + 16 - k = 0$, $(k > 0)$ touch each other at a point, then the largest value of k is _____.

Numerical value type: the answer is a number.

Answer: 36. · Key from source paper

Q128 JEE Main 2020 · 8 Jan · Shift 2 MCQ

If a line $y = mx + c$, is a tangent to the circle $(x - 3)^2 + y^2 = 1$, and it is perpendicular to a line L_1, where L_1 is the tangent to the circle $x^2 + y^2 = 1$, at the point $\left(\frac{1}{\sqrt{2}}, \frac{1}{\sqrt{2}}\right)$, then

(A) $c^2 - 7c + 6 = 0$
(B) $c^2 + 7c + 6 = 0$
(C) $c^2 + 6c + 7 = 0$
(D) $c^2 - 6c + 7 = 0$

Answer: (C) $c^2 + 6c + 7 = 0$ · Key from source paper

Q129 JEE Main 2020 · 7 Jan · Shift 2 MCQ

Let the tangents drawn from the origin to the circle, $x^2 + y^2 - 8x - 4y + 16 = 0$ touch it at the points A and B. Then $(AB)^2$ is equal to

(A) $\frac{52}{5}$
(B) $\frac{56}{5}$
(C) $\frac{64}{5}$
(D) $\frac{32}{5}$

Answer: (C) $\frac{64}{5}$ · Key from source paper

Q130 JEE Main 2019 · 12 Apr · Shift 1 MCQ

If the angle of intersection at a point where the two circles with radii 5 cm and 12 cm intersect is 90°, then the length (in cm) of their common chord is:

(A) $\frac{120}{13}$
(B) $\frac{60}{13}$
(C) $\frac{13}{5}$
(D) $\frac{13}{2}$

Answer: (A) $\frac{120}{13}$ · Key from source paper

Q131 JEE Main 2019 · 12 Apr · Shift 2 MCQ

A circle touching the $x-$ axis at $(3,\ 0)$ and making an intercept of length 8 on the $y-$ axis passes through the point:

(A) $(3,\ 10)$
(B) $(2,\ 3)$
(C) $(3,\ 5)$
(D) $(1,\ 5)$

Answer: (A) $(3,\ 10)$ · Key from source paper

Q132 JEE Main 2019 · 10 Apr · Shift 1 MCQ

The line $x = y$ touches a circle at the point $(1, 1)$. If the circle also passes through the point $(1, -3)$, then its radius is

(A) $3\sqrt{2}$
(B) 3
(C) 2
(D) $2\sqrt{2}$

Answer: (D) $2\sqrt{2}$ · Key from source paper

Q133 JEE Main 2019 · 10 Apr · Shift 1 MCQ

If the circles $x^2 + y^2 + 5Kx + 2y + K = 0$ and $2\left(x^2 + y^2\right) + 2Kx + 3y - 1 = 0,\ (K \in R)$, intersect at the points P and Q, then the line $4x + 5y - K = 0$, passes through P and Q, for:

(A) exactly two values of K
(B) no value of K
(C) exactly one value of K
(D) infinitely many values of K

Answer: (B) no value of K · Key from source paper

Q134 JEE Main 2019 · 10 Apr · Shift 2 MCQ

The locus of the centres of the circles, which touch the circle, $x^2 + y^2 = 1$ externally, also touch the y-axis and lie in the first quadrant, is:

(A) $y = \sqrt{1+2x},\ \ x \geq 0$
(B) $y = \sqrt{1+4x},\ \ x \geq 0$
(C) $x = \sqrt{1+2y},\ \ y \geq 0$
(D) $x = \sqrt{1+4y},\ \ y \geq 0$

Answer: (A) $y = \sqrt{1+2x},\ \ x \geq 0$ · Key from source paper

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Q135 JEE Main 2019 · 9 Apr · Shift 2 MCQ

A rectangle is inscribed in a circle with a diameter lying along the line $3y = x + 7$. If the two adjacent vertices of the rectangle are $(-8, 5)$ and $(6, 5)$, then the area of the rectangle (in sq. units) is:

(A) 72
(B) 98
(C) 56
(D) 84

Answer: (D) 84 · Key from source paper

Q136 JEE Main 2019 · 9 Apr · Shift 2 MCQ

The common tangent to the circles $x^2 + y^2 = 4$ and $x^2 + y^2 + 6x + 8y - 24 = 0$ also passes through the point:

(A) $(4, -2)$
(B) $(-4, 6)$
(C) $(6, -2)$
(D) $(-6, 4)$

Answer: (C) $(6, -2)$ · Key from source paper

Q137 JEE Main 2019 · 8 Apr · Shift 1 MCQ

The sum of the squares of the lengths of the chords intercepted on the circle, $x^2 + y^2 = 16$, by the lines, $x + y = n$, $n \in N$, where N is the set of all natural numbers is:

(A) 210
(B) 105
(C) 320
(D) 160

Answer: (A) 210 · Key from source paper

Q138 JEE Main 2019 · 8 Apr · Shift 2 MCQ

The tangent and the normal lines at the point $\sqrt{3}$, 1 to the circle $x^2 + y^2 = 4$ and the x -axis form a triangle. The area of this triangle (in square units) is:

(A) $\frac{1}{3}$
(B) $\frac{2}{\sqrt{3}}$
(C) $\frac{4}{\sqrt{3}}$
(D) $\frac{1}{\sqrt{3}}$

Answer: (B) $\frac{2}{\sqrt{3}}$ · Key from source paper

Q139 JEE Main 2019 · 12 Jan · Shift 1 MCQ

Let C_1 and C_2 be the centres of the circles $x^2+y^2-2x-2y-2=0$ and $x^2+y^2-6x-6y+14=0$ respectively. If P and Q are the points of intersection of these circles, then the area (in sq. units) of the quadrilateral PC_1QC_2 is :

(A) 6
(B) 4
(C) 8
(D) 9

Answer: (B) 4 · Key from source paper

Q140 JEE Main 2019 · 12 Jan · Shift 1 MCQ

If a variable line $3x+4y-\lambda=0$ is such that the two circles $x^2+y^2-2x-2y+1=0$ and $x^2+y^2-18x-2y+78=0$ are on its opposite sides, then the set of all values of λ is the interval :

(A) $[13,\ 23]$
(B) $(23,\ 31)$
(C) $[12,\ 21]$
(D) $(2,\ 17)$

Answer: (C) $[12,\ 21]$ · Key from source paper

Q141 JEE Main 2019 · 12 Jan · Shift 2 MCQ

If a circle of radius R passes through the origin O and intersects the coordinate axes at A and B, then the locus of the foot of perpendicular from O on AB is :

(A) $(x^2+y^2)(x+y)=R^2xy$
(B) $(x^2+y^2)^3=4R^2x^2y^2$
(C) $(x^2+y^2)^2=4Rx^2y^2$
(D) $(x^2+y^2)^2=4R^2x^2y^2$

Answer: (B) $(x^2+y^2)^3=4R^2x^2y^2$ · Key from source paper

Q142 JEE Main 2019 · 11 Jan · Shift 1 MCQ

A square is inscribed in the circle $x^2 + y^2 - 6x + 8y - 103 = 0$ with its sides parallel to the coordinate axes. Then the distance of the vertex of this square which is nearest to the origin is:

(A) 6
(B) $\sqrt{137}$
(C) $\sqrt{41}$
(D) 13

Answer: (C) $\sqrt{41}$ · Key from source paper

Q143 JEE Main 2019 · 11 Jan · Shift 1 MCQ

Two circles with equal radii are intersecting at the points (0,1) and (0,-1) . The tangent at the point (0,1) to one of the circles passes through the centre of the other circle. Then the distance between the centres of these circles is:

(A) 1
(B) 2
(C) $2\sqrt{2}$
(D) $\sqrt{2}$

Answer: (B) 2 · Key from source paper

Q144 JEE Main 2019 · 11 Jan · Shift 1 MCQ

The straight line $x + 2y = 1$ meets the coordinate axes at A and B. A circle is drawn through A, B and the origin. Then the sum of perpendicular distances from A and B on the tangent to the circle at the origin is:

(A) $\frac{\sqrt{5}}{2}$
(B) $2\sqrt{5}$
(C) $\frac{\sqrt{5}}{4}$
(D) $4\sqrt{5}$

Answer: (A) $\frac{\sqrt{5}}{2}$ · Key from source paper

Q145 JEE Main 2019 · 11 Jan · Shift 2 MCQ

A circle cuts a chord of length 4 a on the x -axis and passes through a point on the y -axis, distant 2 b from the origin. Then the locus of the centre of this circle, is:

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(A) a hyperbola
(B) an ellipse
(C) a straight line
(D) a parabola

Answer: (D) a parabola · Key from source paper

Q146 JEE Main 2019 · 10 Jan · Shift 1 MCQ

If a circle C passing through the point $(4,\ 0)$ touches the circle $x^2 + y^2 + 4x - 6y = 12$ externally at the point $(1,\ -1)$, then the radius of C is:

(A) 4 units
(B) 5 units
(C) $2\sqrt{5}$ units
(D) $\sqrt{57}$ units

Answer: (B) 5 units · Key from source paper

Q147 JEE Main 2019 · 10 Jan · Shift 2 MCQ

If the area of an equilateral triangle inscribed in the circle $x^2 + y^2 + 10x + 12y + c = 0$ is $27\sqrt{3}$ sq. units, then c is equal to:

(A) 25
(B) 13
(C) -25
(D) 20

Answer: (A) 25 · Key from source paper

Q148 JEE Main 2019 · 9 Jan · Shift 1 MCQ

Three circles of radii a, b, c, $a < b < c$ touch each other externally. If they have x - axis as a common tangent, then:

(A) $\frac{1}{\sqrt{a}} = \frac{1}{\sqrt{b}} + \frac{1}{\sqrt{c}}$
(B) a, b, c are in A.P.
(C) $\frac{1}{\sqrt{b}} = \frac{1}{\sqrt{a}} + \frac{1}{\sqrt{c}}$
(D) $\sqrt{a}$, $\sqrt{b}$, $\sqrt{c}$ are in A.P.

Answer: (A) $\frac{1}{\sqrt{a}} = \frac{1}{\sqrt{b}} + \frac{1}{\sqrt{c}}$ · Key from source paper

Q149 JEE Main 2019 · 9 Jan · Shift 2 MCQ

If the circles $x^2 + y^2 - 16x - 20y + 164 = r^2$ and $(x-4)^2 + (y-7)^2 = 36$ intersect at two distinct points, then:

(A) $r > 11$
(B) $0 < r < 1$
(C) $1 < r < 11$
(D) $r = 11$

Answer: (C) $1 < r < 11$ · Key from source paper

Q150 JEE Main 2018 · 16 Apr · Online MCQ

If a circle C, whose radius is 3, touches externally the circle $x^2 + y^2 + 2x - 4y - 4 = 0$ at the point $(2, 2)$, then the length of the intercept cut by this circle C on the x-axis is equal to

(A) $2\sqrt{3}$
(B) $\sqrt{5}$
(C) $3\sqrt{2}$
(D) $2\sqrt{5}$

Answer: (D) $2\sqrt{5}$ · Key from source paper

Q151 JEE Main 2018 · 15 Apr · Shift 1 MCQ

A circle passes through the points $(2, 3)$ and $(4, 5)$. If its centre lies on the line, $y - 4x + 3 = 0$, then its radius is equal to

(A) $\sqrt{5}$
(B) 1
(C) $\sqrt{2}$
(D) 2

Answer: (D) 2 · Checked by our team

Q152 JEE Main 2018 · 15 Apr · Shift 2 MCQ

The tangent to the circle $C_1 : x^2 + y^2 - 2x - 1 = 0$ at the point $(2, 1)$ cuts off a chord of length 4 from a circle C_2 whose centre is $(3, -2)$. The radius of C_2 is

(A) $\sqrt{6}$
(B) 2
(C) $\sqrt{2}$
(D) 3

Answer: (A) $\sqrt{6}$ · Key from source paper

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Q153 JEE Main 2018 · 8 Apr · Offline MCQ

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

(A) 95
(B) 195
(C) 185
(D) 85

Answer: (A) 95 · Key from source paper

Q154 JEE Main 2017 · 9 Apr · Online MCQ

A line drawn through the point $P(4, 7)$ cuts the circle $x^2 + y^2 = 9$ at the points A and B. Then $P_A \cdot P_B$ is equal to.

(A) 74
(B) 53
(C) 56
(D) 65

Answer: (C) 56 · Key from source paper

Q155 JEE Main 2017 · 8 Apr · Online MCQ

If two parallel chords of a circle, having diameter 4 units, lie on the opposite sides of the center and subtend angles $\cos^{-1}\left(\frac{1}{7}\right)$ and $\sec^{-1}(7)$ at the center respectively, then the distance between these chords is:

(A) $\frac{8}{\sqrt{7}}$
(B) $\frac{16}{7}$
(C) $\frac{4}{\sqrt{7}}$
(D) $\frac{8}{7}$

Answer: (A) $\frac{8}{\sqrt{7}}$ · Key from source paper

Q156 JEE Main 2017 · 8 Apr · Online MCQ

If a point $P(0, -2)$ and Q is any point on the circle, $x^2 + y^2 - 5x - y + 5 = 0$, then the maximum value of $(PQ)^2$ is

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(A) $8+5\sqrt{3}$
(B) $\frac{47+10\sqrt{6}}{2}$
(C) $14+5\sqrt{3}$
(D) $\frac{25+\sqrt{6}}{2}$

Answer: (C) $14+5\sqrt{3}$ · Key from source paper

Q157 JEE Main 2016 · 10 Apr · Online MCQ

Equation of the tangent to the circle, at the point $(1,\ -1)$, whose center, is the point of intersection of the straight lines $x-y=1$ and $2x+y=3$ is:

(A) $x+4y+3=0$
(B) $3x-y-4=0$
(C) $x-3y-4=0$
(D) $4x+y-3=0$

Answer: (A) $x+4y+3=0$ · Key from source paper

Q158 JEE Main 2016 · 9 Apr · Online MCQ

A circle passes through $(-2,4)$ and touches the y-axis at $(0,2)$. Which one of the following equations can represent a diameter of this circle ?

(A) $2x-3y+10=0$
(B) $3x+4y-3=0$
(C) $4x+5y-6=0$
(D) $5x+2y+4=0$

Answer: (A) $2x-3y+10=0$ · Key from source paper

Q159 JEE Main 2016 · 3 Apr · Offline MCQ

The centres of those circles which touch the circle, $x^2+y^2-8x-8y-4=0$, externally and also touch the x - axis, lie on

(A) A hyperbola
(B) A parabola
(C) A circle
(D) An ellipse which is not a circle

Answer: (B) A parabola · Key from source paper

Q160 JEE Main 2016 · 3 Apr · Offline MCQ

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

(A) 5
(B) 10
(C) $5\sqrt{2}$
(D) $5\sqrt{3}$

Answer: (D) $5\sqrt{3}$ · Key from source paper

Q161 JEE Main 2015 · 11 Apr · Online MCQ

If a circle passing through the point $(-1,\ 0)$ touches y-axis at $(0,\ 2)$, then the x-intercept of the circle is

(A) $\frac{5}{2}$
(B) 5
(C) $\frac{3}{2}$
(D) 3

Answer: (D) 3 · Key from source paper

Q162 JEE Main 2015 · 10 Apr · Online MCQ

If $y + 3x = 0$ is the equation of a chord of the circle $x^2 + y^2 - 30x = 0$, then the equation of the circle with this chord as diameter is :

(A) $x^2 + y^2 + 3x - 9y = 0$
(B) $x^2 + y^2 - 3x + 9y = 0$
(C) $x^2 + y^2 + 3x + 9y = 0$
(D) $x^2 + y^2 - 3x - 9y = 0$

Answer: (B) $x^2 + y^2 - 3x + 9y = 0$ · Key from source paper

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Q163 JEE Main 2015 · 10 Apr · Online MCQ

If the tangent to the conic, $y - 6 = x^2$ at $(2, 10)$ touches the circle, $x^2 + y^2 + 8x - 2y = k$ (for some fixed k) at a point (α, β); then (α, β) is

(A) $\left(-\frac{7}{17}, \frac{6}{17}\right)$
(B) $\left(-\frac{8}{17}, \frac{2}{17}\right)$
(C) $\left(-\frac{6}{17}, \frac{10}{17}\right)$
(D) $\left(-\frac{4}{17}, \frac{1}{17}\right)$

Answer: (B) $\left(-\frac{8}{17}, \frac{2}{17}\right)$ · Key from source paper

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Q164 JEE Main 2015 · 4 Apr · Offline MCQ

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) 4
(B) 1
(C) 2
(D) 3

Answer: (D) 3 · Key from source paper

Q165 JEE Main 2014 · 19 Apr · Online MCQ

The equation of the circle described on the chord $3x + y + 5 = 0$ of the circle $x^2 + y^2 = 16$ as the diameter is

(A) $x^2 + y^2 + 3x + y + 1 = 0$
(B) $x^2 + y^2 + 3x + y - 22 = 0$
(C) $x^2 + y^2 + 3x + y - 11 = 0$
(D) $x^2 + y^2 + 3x + y - 2 = 0$

Answer: (C) $x^2 + y^2 + 3x + y - 11 = 0$ · Key from source paper

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Q166 JEE Main 2014 · 12 Apr · Online MCQ

For the two circles $x^2 + y^2 = 16$ and $x^2 + y^2 - 2y = 0$, there is/are

(A) one pair of common tangents
(B) two pair of common tangents
(C) three pair of common tangents
(D) no common tangent

Answer: (D) no common tangent · Key from source paper

Q167 JEE Main 2014 · 11 Apr · Online MCQ

The set of all real values of λ for which exactly two common tangents can be drawn to the circles $x^2 + y^2 - 4x - 4y + 6 = 0$ and $x^2 + y^2 - 10x - 10y + \lambda = 0$ is the interval:

(A) $(12, 32)$
(B) $(18, 42)$
(C) $(12, 24)$
(D) $(18, 48)$

Answer: (B) $(18, 42)$ · Key from source paper

Q168 JEE Main 2014 · 9 Apr · Online MCQ

If the point $(1,\ 4)$ lies inside the circle $x^2 + y^2 - 6x - 10y + p = 0$ and the circle does not touch or intersect the coordinate axes, then the set of all possible values of p is the interval

(A) $(25,\ 39)$
(B) $(25,\ 29)$
(C) $(0,\ 25)$
(D) $(9,\ 25)$

Answer: (B) $(25,\ 29)$ · Key from source paper

Q169 JEE Main 2014 · 6 Apr · Offline MCQ

Let C be the circle with center at $(1,1)$ and radius = 1. If T is the circle centered at $(0,y)$, passing through the origin and touching the circle C externally, then the radius of T is equal to

(A) $\frac{1}{2}$
(B) $\frac{1}{4}$
(C) $\frac{\sqrt{3}}{\sqrt{2}}$
(D) $\frac{\sqrt{3}}{2}$

Answer: (B) $\frac{1}{4}$ · Key from source paper

Q170 JEE Main 2013 · 25 Apr · Online MCQ

Statement 1: The only circle having radius $\sqrt{10}$ and a diameter along line $2x+y=5$ is $x^2+y^2-6x+2y=0$. Statement 2 : $2x+y=5$ is a normal to the circle $x^2+y^2-6x+2y=0$.

(A) Statement 1 is false; Statement 2 is true.
(B) Statement 1 is true; Statement 2 is true, Statement 2 is a correct explanation for Statement 1.
(C) Statement 1 is true; Statement 2 is false.
(D) Statement 1 is true; Statement 2 is true; Statement 2 is not a correct explanation for Statement 1.

Answer: (A) Statement 1 is false; Statement 2 is true. · Key from source paper

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Q171 JEE Main 2013 · 25 Apr · Online MCQ

If a circle of unit radius is divided into two parts by an arc of another circle subtending an angle 60° on the circumference of the first circle, then the radius of the arc is:

(A) $\sqrt{3}$
(B) $\frac{1}{2}$
(C) 1
(D) None of these

Answer: (D) None of these · Key from source paper

Q172 JEE Main 2013 · 23 Apr · Online MCQ

If the circle $x^2+y^2-6x-8y+(25-a^2)=0$ touches the axis of x, then a equals.

(A) 0
(B) ± 4
(C) ± 2
(D) ± 3

Answer: (B) ± 4 · Key from source paper

Q173 JEE Main 2013 · 22 Apr · Online MCQ

If a circle C passing through $(4, 0)$ touches the circle $x^2 + y^2 + 4x - 6y - 12 = 0$ externally at a point $(1, -1)$, then the radius of the circle C is :

(A) 5
(B) $2\sqrt{5}$
(C) 4
(D) $\sqrt{57}$

Answer: (A) 5 · Key from source paper

Q174 JEE Main 2013 · 22 Apr · Online MCQ

If two vertices of an equilateral triangle are $\mathrm{A}(-a, 0)$ and $\mathrm{B}(a, 0), a > 0$, and the third vertex C lies above x-axis then the equation of the circumcircle of $\triangle \mathrm{ABC}$ is :

(A) $3x^2 + 3y^2 - 2\sqrt{3}ay = 3a^2$
(B) $3x^2 + 3y^2 - 2ay = 3a^2$
(C) $x^2 + y^2 - 2ay = a^2$
(D) $x^2 + y^2 - \sqrt{3}ay = a^2$

Answer: (A) $3x^2 + 3y^2 - 2\sqrt{3}ay = 3a^2$ · Key from source paper

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Q175 JEE Main 2013 · 9 Apr · Online MCQ

If each of the lines $5x + 8y = 13$ and $4x - y = 3$ contains a diameter of the circle $x^2 + y^2 - 2\left(a^2 - 7a + 11\right)x - 2\left(a^2 - 6a + 6\right)y + b^3 + 1 = 0$, then :

(A) $a = 5$ and $b \notin (-1, 1)$
(B) $a = 1$ and $b \notin (-1, 1)$
(C) $a = 2$ and $b \notin (-\infty, 1)$
(D) $a = 5$ and $b \in (-\infty, 1)$

Answer: (D) $a = 5$ and $b \in (-\infty, 1)$ · Key from source paper

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Q176 JEE Main 2013 · 7 Apr · Offline MCQ

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: (A) $(5, -2)$ · Key from source paper

Q177 JEE Main 2013 · 7 Apr · Offline MCQ

The equation of the circle passing through the foci of the ellipse $\frac{x^2}{16} + \frac{y^2}{9} = 1$, and having centre at $(0, 3)$ is

(A) $x^2 + y^2 - 6y - 5 = 0$
(B) $x^2 + y^2 - 6y + 5 = 0$
(C) $x^2 + y^2 - 6y - 7 = 0$
(D) $x^2 + y^2 - 6y + 7 = 0$

Answer: (C) $x^2 + y^2 - 6y - 7 = 0$ · Key from source paper

Q178 AIEEE 2012 · 26 May · Online MCQ

The number of common tangents of the circles given by $x^2 + y^2 - 8x - 2y + 1 = 0$ and $x^2 + y^2 + 6x + 8y = 0$ is

(A) one
(B) four
(C) two
(D) three

Answer: (C) two · Key from source paper

Q179 AIEEE 2012 · 19 May · Online MCQ

If the line $y = mx + 1$ meets the circle $x^2 + y^2 + 3x = 0$ in two points equidistant from and on opposite sides of x-axis, then

(A) $3m + 2 = 0$
(B) $3m - 2 = 0$
(C) $2m + 3 = 0$
(D) $2m - 3 = 0$

Answer: (B) $3m - 2 = 0$ · Key from source paper

Q180 AIEEE 2012 · 7 May · Online MCQ

The equation of the circle passing through the point $(1, 2)$ and through the points of intersection of $x^2 + y^2 - 4x - 6y - 21 = 0$ and $3x + 4y + 5 = 0$ is given by

(A) $x^2 + y^2 + 2x + 2y + 11 = 0$
(B) $x^2 + y^2 - 2x + 2y - 7 = 0$
(C) $x^2 + y^2 + 2x - 2y - 3 = 0$
(D) $x^2 + y^2 + 2x + 2y - 11 = 0$

Answer: (D) $x^2 + y^2 + 2x + 2y - 11 = 0$ · Key from source paper

Q181 AIEEE 2012 · Offline MCQ

The length of the diameter of the circle which touches the x-axis at the point $(1, 0)$ and passes through the point $(2, 3)$ is

(A) $\frac{10}{3}$
(B) $\frac{3}{5}$
(C) $\frac{6}{5}$
(D) $\frac{5}{3}$

Answer: (A) $\frac{10}{3}$ · Key from source paper

Q182 AIEEE 2011 MCQ

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

(A) $|a| = c$
(B) $a = 2c$
(C) $|a| = 2c$
(D) $2|a| = c$

Answer: (A) $|a| = c$ · Key from source paper

Q183 AIEEE 2010 MCQ

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) $-35 < m < 15$ · Key from source paper

Q184 AIEEE 2009 MCQ

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

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(A) all values of p
(B) all except one value of p
(C) all except two values of p
(D) exactly one value of p

Answer: (A) all values of p · Key from source paper

Q185 AIEEE 2008 MCQ

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) $(-3, -4)$ · Key from source paper

Q186 AIEEE 2007 MCQ

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

(A) $0 < \mathrm{k} < 1/2$
(B) $k \geq 1/2$
(C) $-1/2 \leq k \leq 1/2$
(D) $k \leq 1/2$

Answer: (B) $k \geq 1/2$ · Key from source paper

Q187 AIEEE 2006 MCQ

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

(A) $x^2 + y^2 + 2x - 2y - 47 = 0$
(B) $x^2 + y^2 + 2x - 2y - 62 = 0$
(C) $x^2 + y^2 - 2x + 2y - 62 = 0$
(D) $x^2 + y^2 - 2x + 2y - 47 = 0$

Answer: (D) $x^2 + y^2 - 2x + 2y - 47 = 0$ · Key from source paper

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Q188 AIEEE 2006 MCQ

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

(A) $x^2 + y^2 = \frac{3}{2}$
(B) $x^2 + y^2 = 1$
(C) $x^2 + y^2 = \frac{27}{4}$
(D) $x^2 + y^2 = \frac{9}{4}$

Answer: (D) $x^2 + y^2 = \frac{9}{4}$ · Key from source paper

Q189 AIEEE 2005 MCQ

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

(A) exactly one value of a
(B) no value of a
(C) infinitely many values of a
(D) exactly two values of a

Answer: (B) no value of a · Key from source paper

Q190 AIEEE 2005 MCQ

A circle touches the x-axis and also touches the circle with centre at $(0, 3)$ and radius 2. The locus of the centre of the circle is

(A) an ellipse
(B) a circle
(C) a hyperbola
(D) a parabola

Answer: (D) a parabola · Key from source paper

Q191 AIEEE 2005 MCQ

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

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

Answer: (D) $2ax + 2by - (a^2 + b^2 + p^2) = 0$ · Key from source paper

Q192 AIEEE 2004 MCQ

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

(A) $2ax + 2by + (a^2 + b^2 + 4) = 0$
(B) $2ax + 2by - (a^2 + b^2 + 4) = 0$
(C) $2ax - 2by + (a^2 + b^2 + 4) = 0$
(D) $2ax - 2by - (a^2 + b^2 + 4) = 0$

Answer: (B) $2ax + 2by - (a^2 + b^2 + 4) = 0$ · Key from source paper

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Q193 AIEEE 2004 MCQ

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) $x^2 + y^2 - 2x + 2y - 23 = 0$ · Key from source paper

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Q194 AIEEE 2004 MCQ

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 a diameter is

(A) $x^2 + y^2 - x - y = 0$
(B) $x^2 + y^2 - x + y = 0$
(C) $\mathrm{x}^2 + \mathrm{y}^2 + \mathrm{x} + \mathrm{y} = 0$
(D) $\mathrm{x}^2 + \mathrm{y}^2 + \mathrm{x} - \mathrm{y} = 0$

Answer: (A) $x^2 + y^2 - x - y = 0$ · Key from source paper

Q195 AIEEE 2004 MCQ

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

(A) $(x - p)^2 = 4qy$
(B) $(x - q)^2 = 4py$
(C) $(y - p)^2 = 4qx$
(D) $(y - q)^2 = 4px$

Answer: (A) $(x - p)^2 = 4qy$ · Key from source paper

Q196 AIEEE 2003 MCQ

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

(A) $r > 2$
(B) $2 < \mathrm{r} < 8$
(C) $r < 2$
(D) $\mathrm{r} = 2$

Answer: (B) $2 < \mathrm{r} < 8$ · Key from source paper

Q197 AIEEE 2003 MCQ

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

(A) $x^2 + y^2 - 2x + 2y = 62$
(B) $x^2 + y^2 + 2x - 2y = 62$
(C) $x^2 + y^2 + 2x - 2y = 47$
(D) $x^2 + y^2 - 2x + 2y = 47$

Answer: (D) $x^2 + y^2 - 2x + 2y = 47$ · Key from source paper

Q198 AIEEE 2002 MCQ

If the chord $y = mx + 1$ of the circle $x^2 + y^2 = 1$ subtends an angle of measure 45^0 at the major segment of the circle then value of m is

(A) $2 \pm \sqrt{2}$
(B) $-2 \pm \sqrt{2}$
(C) $-1 \pm \sqrt{2}$
(D) none of these

Answer: (D) none of these · Checked by our team

Q199 AIEEE 2002 MCQ

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

(A) $4 \leq x^2 + y^2 \leq 64$
(B) $x^2 + y^2 \leq 25$
(C) $x^2 + y^2 \geq 25$
(D) $3 \leq x^2 + y^2 \leq 9$

Answer: (A) $4 \leq x^2 + y^2 \leq 64$ · Key from source paper

Q200 AIEEE 2002 MCQ

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

(A) $\left(\frac{1}{2}, \frac{1}{2}\right)$
(B) $\left(\frac{1}{2}, -\sqrt{2}\right)$
(C) $\left(\frac{3}{2}, \frac{1}{2}\right)$
(D) $\left(\frac{1}{2}, \frac{3}{2}\right)$

Answer: (B) $\left(\frac{1}{2}, -\sqrt{2}\right)$ · Key from source paper

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