

MISSION NDA MATHEMATICS

COMPLETE TOPICWISE QUESTIONS

CIRCLE

- The equation of the incircle of the triangle formed by the axes and the line $4x + 3y = 6$ is
 (a) $x^2 + y^2 - 6x - 6y + 9 = 0$ (b) $4(x^2 + y^2 - x - y) + 1 = 0$
 (c) $4(x^2 + y^2 + x + y) + 1 = 0$ (d) none of these
- The equation $x^2 + y^2 + 2gx + 2fy + c = 0$ will represent a real circle if
 (a) $g^2 + f^2 - c < 0$ (b) $g^2 + f^2 - c \geq 0$
 (c) always (d) none of these
- The equation of the circle which passes through the centre of the circle $x^2 + y^2 + 8x + 10y - 7 = 0$ and is concentric with the circle $2x^2 + 2y^2 - 8x - 12y - 9 = 0$ is
 (a) $x^2 + y^2 - 4x - 8y - 97 = 0$ (b) $x^2 + y^2 - 4x - 6y - 87 = 0$
 (c) $x^2 + y^2 - 2x - 8y - 95 = 0$ (d) none of these
- Consider four circles $(x \pm 1)^2 + (y \pm 1)^2 = 1$. Then the equation of the smaller circle touching these four circles is
 (a) $x^2 + y^2 = 3 - \sqrt{2}$ (b) $x^2 + y^2 = 6 - 3\sqrt{2}$
 (c) $x^2 + y^2 = 5 - 2\sqrt{2}$ (d) $x^2 + y^2 = 3 - 2\sqrt{2}$
- If a circle passes through the point $(1, 2)$ and cuts the circle $x^2 + y^2 = 4$ orthogonally, then the equation of the locus of its centre is
 (a) $x^2 + y^2 - 3x - 8y + 1 = 0$ (b) $x^2 + y^2 - 2x - 6y - 7 = 0$
 (c) $2x + 4y - 9 = 0$ (d) $2x + 4y - 1 = 0$
- The Cartesian equation of the curves $x = 7 + 4\cos \alpha$ and $y = -3 + 4\sin \alpha$ is
 (a) $x^2 + y^2 - 14x + 6y + 42 = 0$ (b) $x^2 + y^2 - 6x + 14y + 21 = 0$
 (c) $x^2 + y^2 - 10x + 12y + 28 = 0$ (d) none of these
- The angle between tangents drawn from P to the circle $x^2 + y^2 + 4x - 6y + 9\sin^2 \theta + 13\cos^2 \theta = 0$ is 2θ . The locus of point P is
 (a) $x^2 + y^2 + 4x - 6y - 9 = 0$ (b) $x^2 + y^2 + 4x - 6y - 4 = 0$
 (c) $x^2 + y^2 + 4x - 6y + 9 = 0$ (d) $x^2 + y^2 + 4x - 6y + 4 = 0$
- A line is drawn through a fixed point $P(\alpha, \beta)$ to cut the circle $x^2 + y^2 = r^2$ at A and B . Then $PA \cdot PB$ is equal to
 (a) $(\alpha + \beta)^2 - r^2$ (b) $\alpha^2 + \beta^2 - r^2$
 (c) $(\alpha - \beta)^2 + r^2$ (d) none of these
- Parametric equations of the circle $2x^2 + 2y^2 - 5x - 7y - 3 = 0$ are
 (a) $x = \frac{3}{4} + \frac{5}{4}\sqrt{2}\cos \theta, y = \frac{5}{4} + \frac{5}{4}\sqrt{2}\sin \theta$
 (b) $x = \frac{5}{4} + \frac{7}{4}\sqrt{2}\cos \theta, y = \frac{7}{4} + \frac{7}{4}\sqrt{2}\sin \theta$



- (c) $x = \frac{7}{4} + \frac{9}{4}\sqrt{2}\cos\theta, y = \frac{9}{4} + \frac{9}{4}\sqrt{2}\sin\theta$
 (d) none of these
10. The condition that the straight line $cx - by + b^2 = 0$ may touch the circle $x^2 + y^2 = ax + by$ is
 (a) $abc = 1$ (b) $a = c$
 (c) $b = ac$ (d) none of these
11. The circles $x^2 + y^2 + x + y = 0$ and $x^2 + y^2 + x - y = 0$ intersect at an angle of
 (a) $\frac{\pi}{6}$ (b) $\frac{\pi}{4}$
 (c) $\frac{\pi}{3}$ (d) $\frac{\pi}{2}$
12. The equation of the tangent lines to the circle $x^2 + y^2 = 9$ which are parallel to the line $2x + y - 3 = 0$ is
 (a) $2x + y \pm 3\sqrt{5} = 0$ (b) $2x + y \pm 7\sqrt{5} = 0$
 (c) $2x + y \pm 2\sqrt{3} = 0$ (d) none of these
13. If OA and OB are tangents from the origin to the circle $x^2 + y^2 + 2gx + 2fy + c = 0$ and C is the centre of the circle, then the area of the quadrilateral $OACB$ is
 (a) $\frac{1}{2}\sqrt{g^2 + f^2 - c}$ (b) $\sqrt{c(g^2 + f^2 - c)}$
 (c) $c\sqrt{g^2 + f^2 - c}$ (d) $\sqrt{\frac{g^2 + f^2 - c^2}{c}}$
14. A circle of radius 5 unit touches both the axes and lies in the first quadrant. If the circle makes one complete roll on the x -axis along the positive direction of the x -axis, then its equation in the new position is
 (a) $x^2 + y^2 + 20\pi x - 10y + 100\pi^2 = 0$
 (b) $x^2 + y^2 + 20\pi x + 10y + 100\pi^2 = 0$
 (c) $x^2 + y^2 - 20\pi x - 10y + 100\pi^2 = 0$
 (d) none of these
15. If $(\alpha, 3)$ and $(3, 5)$ are the extremities of the diameter of a circle with centre at $(2, \beta)$, then the values of α and β are
 (a) $\alpha = 1, \beta = 4$ (b) $\alpha = 4, \beta = 2$
 (c) $\alpha = 4, \beta = 1$ (d) none of these
16. The angle between the pair of tangents from the point $(1, \frac{1}{2})$ to the circle $x^2 + y^2 + 4x + 2y - 4 = 0$ is
 (a) $\cos^{-1}\frac{4}{5}$ (b) $\sin^{-1}\frac{4}{5}$
 (c) $\sin^{-1}\frac{3}{5}$ (d) none of these
17. If the distances from the the origin of the centres of three circles $x^2 + y^2 + 2\lambda_k x - c^2 = 0 (k = 1, 2, 3)$ are in G.P., then the lengths of the tangents drawn to them from any point of the circle $x^2 + y^2 = c^2$ are in
 (a) A.P. (b) G.P.
 (c) H.P. (d) none of these
18. The radius of the circle passing through the points $(1, 2), (5, 2)$ and $(5, -2)$ is
 (a) $2\sqrt{5}$ (b) $3\sqrt{2}$
 (c) $5\sqrt{2}$ (d) $2\sqrt{2}$



19. The locus of the point of intersection of tangents to the circles $x = a \cos \theta$ and $y = a \sin \theta$ at the points, whose parametric angles differ by $\pi/2$, is
 (a) a straight line (b) a circle
 (c) a pair of straight lines (d) none of these
20. The circle $x^2 + y^2 + 4x - 7y + 12 = 0$ cuts an intercept on the y-axis equal to
 (a) 7 (b) 4
 (c) 3 (d) 1
21. The equation of a circle passing through $(3, -6)$ and touching both the axes is
 (a) $x^2 + y^2 - 6x + 6y + 9 = 0$
 (b) $x^2 + y^2 + 6x - 6y + 9 = 0$
 (c) $x^2 + y^2 + 30x - 30y + 225 = 0$
 (d) none of these
22. 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) $3 \leq x^2 + y^2 \leq 9$
23. The equation of the line parallel to the line $3x + 4y = 0$ and touching the circle $x^2 + y^2 = 9$ in the first quadrant is
 (a) $3x + 4y = 9$ (b) $3x + 4y = 45$
 (c) $3x + 4y = 15$ (d) none of these
24. The locus of the centre of a circle of diameter 4 which rolls on the outside of the circle $x^2 + y^2 + 3x - 6y - 9 = 0$ is
 (a) $x^2 + y^2 + 3x - 6y + 5 = 0$ (b) $x^2 + y^2 + 3x - 6y - 31 = 0$
 (c) $x^2 + y^2 + 3x - 6y + \frac{29}{4} = 0$ (d) none of these
25. Let a circle be $2x(x - a) + y(2y - b) = 0$, $a \neq 0$, $b \neq 0$. Then the condition on a and b if two chords each bisected by the x-axis, can be drawn to the circle from $(a, \frac{b}{2})$, is
 (a) $a^2 > 2b^2$ (b) $a^2 < 2b^2$
 (c) $a^2 = 2b^2$ (d) none of these
26. If the circle $x^2 + y^2 + 2gx + 2fy + c = 0$ is touched by $y = x$ at P such that $OP = 6\sqrt{2}$, then the value of c is
 (a) 36 (b) 144
 (c) 72 (d) none of these
27. If one of the diameters of the circle $x^2 + y^2 - 2x - 6y + 6 = 0$ is a chord to the circle with centre $(2, 1)$, then the radius of the circle is
 (a) $\sqrt{3}$ (b) $\sqrt{2}$
 (c) 3 (d) 2
28. The length of the common chord of the two circles $(x - a)^2 + (y - b)^2 = c^2$ and $(x - b)^2 + (y - a)^2 = c^2$ is
 (a) $\sqrt{4c^2 + 2(a - b)^2}$ (b) $\sqrt{4c^2 - (a - b)^2}$
 (c) $\sqrt{4c^2 - 2(a - b)^2}$ (d) $\sqrt{2c^2 - 2(a - b)^2}$
29. A triangle is formed by the lines whose combined equation is given by $(x + y - 4)(xy - 2x - y + 2) = 0$. The equation of its circumcircle is



(a) $x^2 + y^2 - 5x - 3y + 8 = 0$

(b) $x^2 + y^2 - 3x - 5y + 8 = 0$

(c) $x^2 + y^2 - 3x - 5y - 8 = 0$

(d) none of these

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

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

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

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

(d) $\left(\frac{1}{2}, -2^{1/2}\right)$

Assertion-Reason Type Questions

These questions are Assertion-Reason type questions. Each of these questions contains two statements. Statement I (Assertion) and Statement II (Reason). Each of these questions has four alternative answers. Only one of them is the correct answer. Select the correct answer as given:

- (a) Both Statement I and Statement II are true and Statement II is a correct explanation of Statement I.
- (b) Both Statement I and Statement II are true but Statement II is not a correct explanation of Statement I.
- (c) Statement I is true, Statement 2 is false.
- (d) Statement I is false, Statement II is true.

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

Statement I: The tangents are perpendicular.

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

32. Statement I: Locus of mid-points of chords of $x^2 + y^2 = a^2$ subtending constant angle β at the centre is $x^2 + y^2 = a^2 \cos^2 \frac{\beta}{2}$.

Statement II: Such a locus must be a closed curve.

33. Statement I: The length of the tangent from the origin to the circle $x^2 + y^2 + 4x + 6y + \lambda = 0$ is 4 if $\lambda = 16$.

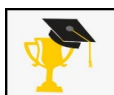
Statement II: Length of tangent is $\sqrt{5}$.

34. Statement I: The number of common tangents to the circles $x^2 + y^2 = 4$ and $(x - 5)^2 + y^2 = k^2$ will be 4 only if $k < 1$.

Statement II: Two circles have four common tangents if the distance between the centres is greater than the sum of the radii.

Previous Years' Questions

35. If the two circles $(x - 1)^2 + (y - 3)^2 = r^2$ and $x^2 + y^2 - 8x + 2y + 9 = 0$ intersect in two distinct points, then



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- (a) $2 < r < 8$ (b) $r < 2$
(c) $r = 2$ (d) $r > 2$
36. The intercept on the line $y = x$ by the circle $x^2 + y^2 - 2x = 0$ is AB . The equation of the circle with AB as a diameter is
(a) $x^2 + y^2 - x - y = 0$ (b) $x^2 + y^2 - x + y = 0$
(c) $x^2 + y^2 + x + y = 0$ (d) $x^2 + y^2 + x - y = 0$
37. 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) $x^2 + y^2 + 2x - 2y - 23 = 0$
38. 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) a hyperbola (b) a parabola
(c) an ellipse (d) a circle
39. 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 $5x + by = 0$ passes through P and Q for
(a) exactly two values of a (b) infinitely many values of a
(c) no value of a (d) exactly one value of a
40. 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) $x^2 + y^2 - 2ax - 3by + (a^2 - b^2 - p^2) = 0$
(b) $2ax + 2by - (a^2 + b^2 - p^2) = 0$
(c) $x^2 + y^2 - ax - 4by + (a^2 + b^2 - p^2) = 0$
(d) $2ax + 2by - (a^2 - b^2 + p^2) = 0$
41. 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 $2\pi/3$ at its centre is
(a) $x^2 + y^2 = 1$ (b) $x^2 + y^2 = \frac{27}{4}$
(c) $x^2 + y^2 = \frac{9}{4}$ (d) $x^2 + y^2 = \frac{3}{2}$
42. If the lines $3x - 4y - 7 = 0$ and $2x - 3y - 5 = 0$ are two diameters of a circle of area 49π sq. units, the equation of the circle is
(a) $x^2 + y^2 + 2x - 2y - 62 = 0$ (b) $x^2 + y^2 - 2x - 2y - 62 = 0$
(c) $x^2 + y^2 - 2x + 2y - 47 = 0$ (d) $x^2 + y^2 + 2x - 2y - 47 = 0$
43. Let $ABCD$ be a quadrilateral with area 18, with side AB parallel to the side CD and $AB = 2CD$. Let AD be perpendicular to AB and CD . If a circle is drawn inside the quadrilateral $ABCD$ touching all the sides, then its radius is
(a) 3 (b) 2



(c) $3/2$

(d) 1

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

(a) $0 < k < \frac{1}{2}$

(b) $k \geq \frac{1}{2}$

(c) $-\frac{1}{2} \leq k \leq \frac{1}{2}$

(d) $k \leq \frac{1}{2}$

45. 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) $(3,-4)$

46. 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 $(1,1)$ and

(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

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

(a) $-85 < m < -35$

(b) $-35 < m < 15$

(c) $15 < m < 65$

(d) $35 < m < 85$

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

(a) 4

(b) 3

(c) 2

(d) 1

49. The length of the transversal common tangent to the circle $x^2 + y^2 = 1$ and $(x - t)^2 + y^2 = 1$ is $\sqrt{21}$, then t is equal to

(a) ± 2

(b) ± 5

(c) ± 3

(d) none of these

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

(a) $\frac{\sqrt{3}}{5}$

(b) $\frac{17}{6\sqrt{5}}$

(c) $\frac{\sqrt{2}}{3}$

(d) $\frac{17}{3\sqrt{5}}$

51. The equation of the circle concentric to the circle $2x^2 + 2y^2 - 3x + 6y + 2 = 0$ and having area double the area of this circle is

(a) $8x^2 + 8y^2 - 24x + 48y - 13 = 0$

(b) $16x^2 + 16y^2 + 24x - 48y - 13 = 0$

(c) $16x^2 + 16y^2 - 24x + 48y - 13 = 0$



(d) $8x^2 + 8y^2 + 24x - 48y - 13 = 0$

52. The length of the common chord of the circles $x^2 + y^2 + 2x + 3y + 1 = 0$ and $x^2 + y^2 + 4x + 3y + 2 = 0$ is

(a) $\frac{9}{2}$

(b) $2\sqrt{2}$

(c) $3\sqrt{2}$

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

53. If the line $y \cos \alpha = x \sin \alpha + a \cos \alpha$ is a tangent to the circle $x^2 + y^2 = a^2$, then

(a) $\sin^2 \alpha = 1$

(b) $\cos^2 \alpha = 1$

(c) $\sin^2 \alpha = a^2$

(d) $\cos^2 \alpha = a^2$

54. The radius of the circle, which is touched by the line $y = x$ and has its centre on the positive direction of the x -axis and also cuts off a chord of length 2 unit along the line $\sqrt{3}y - x = 0$, is

(a) $\sqrt{5}$

(b) $\sqrt{3}$

(c) $\sqrt{2}$

(d) 1

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

(a) $\frac{\pi}{2}$

(b) $\frac{\pi}{3}$

(c) $\frac{\pi}{4}$

(d) $\frac{\pi}{6}$

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

(a) a parabola

(b) a circle

(c) an ellipse

(d) a pair of straight lines

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

(a) $\sqrt{PQ \cdot RS}$

(b) $\frac{PQ+RS}{2}$

(c) $\frac{2PQ \cdot RS}{PQ+RS}$

(d) $\sqrt{\frac{PQ^2+RS^2}{2}}$

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

(a) $\frac{2b}{\sqrt{a^2-4b^2}}$

(b) $\frac{\sqrt{a^2-4b^2}}{2b}$

(c) $\frac{2b}{a-2b}$

(d) $\frac{b}{a-2b}$

59. The centre of the circle inscribed in square formed by the lines $x^2 - 8x + 12 = 0$ and $y^2 - 14y + 45 = 0$ is

(a) $(4,7)$

(b) $(7,4)$



(c) (9,4)

(d) (4,9)

60. A circle is given by $x^2 + (y - 1)^2 = 1$, another circle C touches it externally and also the x -axis, then the locus of its centre is

(a) $\{(x, y): x^2 = 4y\} \cup \{(x, y): y \leq 0\}$

(b) $\{(x, y): x^2 + (y - 1)^2 = 4\} \cup \{(x, y): y \leq 0\}$

(c) $\{(x, y): x^2 = y\} \cup \{(0, y): y \leq 0\}$

(d) $\{(x, y): x^2 = 4y\} \cup \{(0, y): y \leq 0\}$

61. The intercept on the line $y = x$ by the circle $x^2 + y^2 - 2x = 0$ is AB . The equation of the circle on AB as a diameter is

(a) $x^2 + y^2 - x - y = 0$

(b) $x^2 + y^2 - x + y = 0$

(c) $x^2 + y^2 + x + y = 0$

(d) $x^2 + y^2 + x - y = 0$

62. The equation of the circle having $x - y - 2 = 0$ and $x - y + 2 = 0$ as two tangents and $x - y = 0$ as a diameter is

(a) $x^2 + y^2 + 2x - 2y + 1 = 0$

(b) $x^2 + y^2 - 2x + 2y - 1 = 0$

(c) $x^2 + y^2 = 2$

(d) $x^2 + y^2 = 1$

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

(a) $\frac{\pi}{3}$

(b) $\frac{\pi}{6}$

(c) $\frac{\pi}{2}$

(d) $\frac{\pi}{8}$

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

(a) $x^2 + y^2 - 2x - 2y - 35 = 0$

(b) $x^2 + y^2 - 2x + 2y - 47 = 0$

(c) $x^2 + y^2 + 2x - 2y + 77 = 0$

(d) $x^2 + y^2 + 2x + 2y + 84 = 0$

65. The equation of the circle passing through (4,6) and having centre (1,2) is

(a) $x^2 + y^2 - 2x - 4y - 20 = 0$

(b) $x^2 + y^2 - 2x + 4y - 20 = 0$

(c) $x^2 + y^2 + 2x - 4y - 20 = 0$

(d) $x^2 + y^2 + 2x + 4y - 20 = 0$

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

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

(b) $\frac{5}{9}$

(c) $\frac{3}{4}$

(d) $\frac{5}{6}$

67. The length of the tangent to the circle $x^2 + y^2 - 2x - y - 7 = 0$ from $(-1, -3)$ is

(a) $2\sqrt{3}$

(b) 4

(c) $\sqrt{8}$

(d) 8

68. The number of common tangents to the circles $x^2 + y^2 - 6x + 9 = 0$ and $x^2 + y^2 - 14x - 8y + 61 = 0$ is

(a) 1

(b) 2



(c) 3

(d) 4

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

(a) $8x - 11y + 2 = 0$

(b) $8x - 11y - 2 = 0$

(c) $8x + 11y + 2 = 0$

(d) $8x + 11y - 2 = 0$

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

(a) $x^2 + y^2 - 2x - 2y + 1 = 0$

(b) $x^2 + y^2 - x - y = 0$

(c) $x^2 + y^2 + 2x + 2y - 7 = 0$

(d) $x^2 + y^2 + x + y - 2 = 0$

71. 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) $10/3$

(b) $3/5$

(c) $6/5$

(d) $5/3$

ANSWERS

1. (b)	2. (b)	3. (b)	4. (d)	5. (c)	6. (a)
7. (c)	8. (b)	9. (b)	10. (b)	11. (d)	12. (a)
13. (b)	14. (d)	15. (a)	16. (b)	17. (b)	18. (d)
19. (b)	20. (d)	21. (a)	22. (a)	23. (c)	24. (b)
25. (a)	26. (c)	27. (c)	28. (c)	29. (b)	30. (d)
31. (b)	32. (b)	33. (d)	34. (d)	35. (a)	36. (a)
37. (a)	38. (b)	39. (c)	40. (b)	41. (c)	42. (c)
43. (b)	44. (b)	45. (b)	46. (b)	47. (b)	48. (a)
49. (b)	50. (b)	51. (c)	52. (b)	53. (b)	54. (c)
55. (c)	56. (b)	57. (a)	58. (a)	59. (a)	60. (d)
61. (a)	62. (c)	63. (c)	64. (b)	65. (a)	66. (c)
67. (c)	68. (d)	69. (a)	70. (b)	71. (a)	

