1. If A and B are the points (– 2, 2) and (3, – 1), then the coordinates of the point C on AB produced such that $AC = 2BC$ are :
(a) (8, – 4) (b) (3, 2) (c) (4, 5) (d) (1/2, 1/2)

2. A straight line through the origin meets the parallel lines $4x + 2y = 9$ and $2x + y + 6 = 0$ at the points P and Q respectively. Then the point O divides the segment PQ in the ratio :
(a) 1 : 2 (b) 3 : 4 (c) 2 : 1 (d) 4 : 3

3. The incentre of the triangle with vertices $(1, \sqrt{3})$, (0, 0) and (2, 0) is :
(a) $\left(1, \frac{\sqrt{3}}{2}\right)$ (b) $\left(\frac{2}{3}, \frac{1}{\sqrt{3}}\right)$ (c) $\left(\frac{2}{3}, \frac{\sqrt{3}}{2}\right)$ (d) $\left(1, \frac{1}{\sqrt{3}}\right)$

4. If (0, 3), (1, 1) and (–1, 2) be the midpoints of the sides of a triangle, its centroid is at :
(a) (0, 2) (b) (0, 1) (c) (0, 0) (d) None of these

5. Circumcentre of the triangle whose vertices are (1, 0), (3, 0) and (1, 6) is :
(a) (3, 2) (b) (2, 3) (c) (3/2, 2/3) (d) (2/3, 3/2)

6. The vertices of a triangle are (6, 0), (0, 6) and (6, 6), the distance between its circumcentre and centroid is :
(a) $2\sqrt{2}$ (b) 2 (c) $\sqrt{2}$ (d) 1

7. Which of the following set of the points form an equilateral triangle :
(a) (1, 0), (4, 0), (7, – 1) (b) (0, 0), (3/2), (4/3), (4/3, 3/2)
(c) (2/3, 0) (0, 2/3), (1, 1) (d) None of these

8. The triangle formed by the tangent to the curve $f(x) = x^2 + bx - b$ at the point (1, 1) and the coordinates axes lies in the first quadrant. If its area is 2, then the value of b is :
(a) 1 (b) 3 (c) – 3 (d) 1

9. If A and B are two points on the line $3x + 4y + 15 = 0$ such that $OA = OB = 9$ units, where O is the origin. The area of the triangle OAB is :
(a) $18\sqrt{2}$ (b) $2\sqrt{2}$ (c) 7 (d) None of these

10. The perpendicular bisector of the line segment joining P (1, 4) and Q (k, 3) has y-intercept – 4. Then, a possible value of k is :
(a) – 4 (b) 1 (c) 2 (d) – 2

11. Area of the triangle formed by the lines $7x - 2y + 10 = 0$, $7x + 2y - 10 = 0$ and $y + 2 = 0$ is :
(a) 8 (b) 14 (c) 16 (d) 18/7

12. Let A (2, 4), B (– 3, – 8) and C (x, y) are three points such that $\angle ACB$ is a right angle and the area of ΔABC = (41/2) units. The number of such points C is :
(a) 0 (b) 2 (c) 4 (d) Infinite

13. If x_1, x_2, x_3 as well as y_1, y_2, y_3 are in G.P. with the same common ratio, then the points (x_1, y_1), (x_2, y_2) and (x_3, y_3)
(a) lie on a straight line (b) lie on an ellipse (c) lie on a circle (d) are vertices of a triangle

14. The three distinct points $(k, k + 1)$, $(k^2, 2k)$, $(k^2 + k, 2k + 1)$ are collinear for :
(a) All real values of k (b) no value of k (c) Exactly two values of k (d) None of these

15. Vertices of a quadrilateral $ABCD$ are A (1, 2), B (4, 6), C (8, 9) and D (5, 5). Then quadrilateral $ABCD$ is :
(a) Rhombus (b) Rectangle (c) Square (d) None of these

16. If P (1, 2), Q (4, 6), R (5, 7) and S (a, b) are the vertices of a parallelogram $PQRS$, then :
(a) $a = 2, b = 4$ (b) $a = 3, b = 4$ (c) $a = 2, b = 3$ (d) $a = 3, b = 5$

17. The locus of a point which moves such that the sum of the squares of its distances from the three vertices of a triangle is constant is a circle whose centre is at the :
(a) Centroid of the triangle (b) Orthocentre (c) Incentre (d) None of these

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

(a) a pair of straight lines (b) a circle (c) a straight line (d) None of these

19. A straight rod of length 9 units slides with its ends A, B always on the X and Y-axis respectively. Then the locus of the centroid of ΔAOB is :

(a) $x^2 + y^2 = 3$ (b) $x^2 + y^2 = 9$ (c) $x^2 + y^2 = 1$ (d) $x^2 + y^2 = 81$

20. If the sum of the distances of a point from two perpendicular line in a plane is 1, then its locus is :

(a) square (b) circle (c) straight line (d) two intersecting lines

21. The graph of the function $y = \cos x \cos (x + 2) - \cos^2 (x + 1)$ is :

(a) a straight line passing through $(0, -\sin^2 1)$ with slope 2

(b) a straight line passing through (0, 0)

(c) a parabola with vertex $(1, -\sin^2 1)$

(d) a straight line passing through the point $(\pi/2, -\sin^2 1)$ and parallel to the x-axis

22. Let PS be the median of the triangle with vertices P (2, 2), Q (6, – 1) and R (7, 3). The equation of the line passing through (1, –1) and parallel to PS is :

(a) $2x - 9y - 7 = 0$ (b) $2x - 9y - 11 = 0$ (c) $2x + 9y - 11 = 0$ (d) $2x + 9y + 7 = 0$

23. The line $3x - 4y + 7 = 0$ is rotated through an angle $\pi/4$ in the anticlockwise direction about the point (– 1, 1). The equation of the line in its new position is :

(a) $x + 7y - 6 = 0$ (b) $7y - x - 6 = 0$ (c) $x - 7y + 8 = 0$ (d) $7x - y + 8 = 0$

24. Line L has intercepts a and b on the co-ordinates axes. When the axes are rotated through a given angle keeping the origin fixed, the same line L has intercepts p and q. Then :

(a) $a^2 + b^2 = p^2 + q^2$ (b) $\frac{1}{a^2} + \frac{1}{b^2} = \frac{1}{p^2} + \frac{1}{q^2}$ (c) $a^2 + p^2 = b^2 + q^2$ (d) $\frac{1}{a^2} + \frac{1}{p^2} = \frac{1}{b^2} + \frac{1}{q^2}$

25. The point A (2, 1) is translated parallel to the line $x - y = 3$ by a distance 4 units. If its new position A' is in third quadrant then the co-ordinates of A' are :

(a) $(2 + 2\sqrt{2}, 1 + 2\sqrt{2})$ (b) $(-2 + 2\sqrt{2}, -1 - 2\sqrt{2})$

(c) $(2 - 2\sqrt{2}, 1 - 2\sqrt{2})$ (d) None of these

26. The distance of the point (2, 3) from the line $x - 2y + 5 = 0$ measured in a direction parallel to the line $x - 3y = 0$ is :

(a) $2\sqrt{10}$ (b) $\sqrt{10}$ (c) $2\sqrt{5}$ (d) None of these

27. Let the algebraic, sum of the perpendicular distances from the points (2, 0), (0, 2) and (1, 1) to a variable straight line is zero; then line passes through a fixed point whose co-ordinates are :

(a) (1, 1) (b) (–1, – 1) (c) (1, – 1) (d) (– 1, 1)

28. If a, b, c are first, third and fifth terms of an A.P. then $ax + by + c = 0$ represents a family of lines passing through the point $(a \neq 0, b \neq 0, c \neq 0)$:

(a) (0, 0) (b) (1, – 2) (c) (– 1, 2) (d) None of these

29. Equation of a different line passing through point of intersection of the lines $x - 2 = 0$ and $y + 1 = 0$ and at a unit distance from the origin is :

(a) $4x + 3y + 5 = 0$ (b) $4x - 3y - 5 = 0$ (c) $4x - 3y + 5 = 0$ (d) $4x + 3y - 5 = 0$

30. The line $(p + 2q) x + (p - 3q) y = p - q$ for different value of p and q passes through the point :

(a) (3/2, 5/2) (b) (2/5, 2/5) (c) (3/4, 3/5) (d) (2/5, 3/5)

31. Equation of the line passing through the point of intersection of the lines $x - y = 1$ and $2x + 3y = 4$ and equidistant from the point (2, –3) and (1, 1) is :

(a) $7x - 2y = 0$ (b) $14x + y - 20 = 0$ (c) $2x - 2y = 5$ (d) None of these

32. That line of the family $p (2x + 3y - 13) + q (x - y + 1) = 0$ which is farthest from the origin is :

(a) $4x + 3y - 17 = 0$ (b) $3x + 2y - 12 = 0$ (c) $2x + 3y - 13 = 0$ (d) None of these

33. For all real values of a and b the lines $(2a + b) x + (a + 3b) y + (b - 3a) = 0$ and $mx + 2y + 6 = 0$ are concurrent. Then $m =$

(a) – 2 (b) – 3 (c) – 4 (d) – 5

34. If $4a^2 + 9b^2 - c^2 + 12 ab = 0$, then the family of straight lines $ax + by + c = 0$ is concurrent at :

(a) (2, 3) (b) (1, 2) (c) (0, 1) (d) None of these

35. If the lines $x = a + m$, $y = -2$ and $y = mx$ are concurrent, the least value of $|a|$ is :
(a) 0 (b) $\sqrt{2}$ (c) $2\sqrt{2}$ (d) None of these

36. For what values of α the point $(\alpha, 2)$ lies inside the triangle formed by the lines $x = 0$, $x + y = 4$ and $x - y = 4$:
(a) $0 < \alpha < 2$ (b) $0 < \alpha < 4$ (c) $2 < \alpha < 4$ (d) None of these

37. A straight line through the point $A(3, 4)$ is such that its intercept between the axes is bisected at A. Its equation is :
(a) $3x - 4y + 7 = 0$ (b) $4x + 3y = 24$ (c) $3x + 4y = 25$ (d) $x + y = 7$

38. If the points (1, 2) and (3, 4) be on the same side of the line $3x - 5y + a = 0$ then :
(a) $7 < a < 11$ (b) $b = 7$ (c) $a = 11$ (d) $a < 7$ or $a > 11$

39. The incentre of a triangle is (1, 2) and the coordinates of two of its vertices are (–1, 1) and (3, 2). Its inradius is equal to :
(a) 1 (b) 2 (c) 3 (d) None of these

40. The distance between the lines $x = y + 1 = 0$ and $2x + 2y + 5 = 0$ is :
(a) $\frac{3}{2}$ (b) $\frac{3\sqrt{2}}{2}$ (c) $\frac{3}{2\sqrt{2}}$ (d) $\frac{5}{2}$

41. The midpoints D, E, F of the sides BC, CA and AB of a ΔABC are (2, – 1), (1, 3) and (–1, – 2) respectively. The slope of the altitude through B is :
(a) 3 (b) – 3 (c) 1/3 (d) 5/2

42. The orthocentre of the triangle whose sides are given by $3x - 4y + 5 = 0$, $x + y - 4 = 0$ and $4x + 3y = 10$ is :
(a) (– 3, – 1) (b) (1, – 2) (c) (3, 1) (d) (1, 2)

43. If $A(0, 0)$, $B(0, 3)$ and $C(4, 0)$ are the vertices of a triangle then equation of internal bisector of $\angle B$ is given by :
(a) $2x + y + 3 = 0$ (b) $2x + y - 3 = 0$ (c) $2x - y + 3 = 0$ (d) None of these

44. The vertices of a triangle are $A(-1, -7)$, $B(5, 1)$, $C(1, 4)$. The equation of the bisector of the angle $\angle ABC$:
(a) $x + y + 1 = 0$ (b) $x - y + 1 = 0$ (c) $x - 7y + 2 = 0$ (d) $x + 1 = 0$

45. Let $P = (-1, 0)$, $Q = (0, 0)$ and $R = (3, 3\sqrt{3})$ be three points. Then the equation of the bisector of the angle PQR is :
(a) $\frac{\sqrt{3}}{2}x + y = 0$ (b) $x + \sqrt{3}y = 0$ (c) $\sqrt{3}x + y = 0$ (d) $x + \frac{\sqrt{3}}{2}y = 0$

46. The angular bisector of the obtuse angle between the lines $y = x$ and $y = 3x$ is :
(a) $(\sqrt{5} - 1)y = (\sqrt{5} - 3)x$ (b) $(\sqrt{5} + 1)y = (\sqrt{5} + 3)x$
(c) $(3 - \sqrt{5})y = (\sqrt{5} - 1)x$ (d) None of these

47. If the vertices of a ΔABC are $A(7, 3)$, $B(0, 2)$ and $C(6, 0)$, then $2\sqrt{2}$ is the length from C to AB of the :
(a) Median (b) Altitude (c) Angular bisector (d) None of these

48. Shortest distance of bisector of $xy = 0$ from the point (3, 0) is :
(a) 1 (b) $3\sqrt{2}/2$ (c) $1/\sqrt{2}$ (d) $(2/3)\sqrt{2}$

49. The point $(a^2, a + 1)$ is a point in the angle between the lines $3x - y + 1 = 0$ and $x + 2y - 5 = 0$ containing the origin. Then 'a' belongs to the interval :
(a) (1, 3) (b) $(-3, 0) \cup (1/3, 1)$ (c) $(0, 1/3) \cup (1, \infty)$ (d) $(0, 1/3) \cup (-\infty, -3)$

50. The image of the point $A(1, 2)$ by the line mirror $y = x$ is the point B and the image of B by the line mirror $y = 0$ is the point (α, β), then :
(a) $\alpha = 1, \beta = -2$ (b) $\alpha = 0, \beta = 0$ (c) $\alpha = 2, \beta = -1$ (d) None of these

51. The coordinates of the image of the origin O with respect to the straight line $x + y + 1 = 0$ are :
(a) (– 1/2, – 1/2) (b) (– 2, – 2) (c) (1, 1) (d) (– 1, – 1)

52. The co-ordinates of the foot of the perpendicular from the point (2, 3) to the line $x + 2y = 3$ are :
(a) (– 1, 1) (b) (1, –1) (c) (1, 1) (d) (– 1, – 1)

53. A ray coming from the point (3, 4) is reflected at point A on the x-axis and then passes through the point (1, 8). The co-ordinate of point A is :

(a) $\left(\frac{7}{3}, 0\right)$ (b) (5, 0) (c) $\left(\frac{29}{3}, 0\right)$ (d) $\left(\frac{9}{2}, 0\right)$

54. Two consecutive sides of a parallelogram are $3x - y = 1$ and $x + y = 3$. If equation to one diagonal is $3x + y = 11$, the equation to the other diagonal is :
(a) $y - 2 = 0$ (b) $y - 3x = 10$ (c) $x - 4 = 0$ (d) None of these

55. Area of the parallelogram formed by the lines $y = mx$, $y = mx + 1$, $y = nx$ and $y = nx + 1$ equals :
(a) $\frac{|m+n|}{(m-n)^2}$ (b) $\frac{2}{|m+n|}$ (c) $\frac{1}{|m+n|}$ (d) $\frac{1}{|m-n|}$

56. Number of integral point (coordinates) in the triangle formed by the vertices (0, 0) (21, 0) and (0, 21) is :
(a) 231 (b) 210 (c) 190 (d) 171

57. If $x^2 - kxy + y^2 + 2y + 2 = 0$ denotes a pair of straight lines then $k =$
(a) $1/\sqrt{2}$ (b) $2\sqrt{2}$ (c) $\sqrt{2}$ (d) 2

58. The angle between the pair of lines $y^2 - 2xy \operatorname{cosec} \theta + x^2 = 0$, $0 < \theta \le \pi/2$, is :
(a) $\pi/2$ (b) θ (c) $(\pi/2) - \theta$ (d) None of these

59. The distance between the lines represented by $2x^2 + 4xy + 2y^2 - x - y - 1 = 0$ is :
(a) $3/2\sqrt{2}$ (b) $3\sqrt{2}/8$ (c) 2 (d) None of these

60. If $9x^2 + 2hxy + 4y^2 + 6x + 2fy - 3 = 0$ represents two parallel lines, the distance between them is :
(a) $2/\sqrt{3}$ (b) $3/\sqrt{13}$ (c) $4/\sqrt{13}$ (d) $5/\sqrt{13}$

61. The equation of the line passing through the point of intersection of the lines given by the equation, $6x^2 + 5xy - 4y^2 + 7x + 13y - 3 = 0$ and perpendicular to the line $x + y = 10$ is :
(a) $x - y = 0$ (b) $2x - 2y + 3 = 0$ (c) $x - y + 2 = 0$ (d) None of these

62. If the lines joining the origin to the points of interaction of $y = mx + 1$ and $2x^2 + 3y^2 = 1$ are perpendicular to each other, then $m =$
(a) + 2 (b) $\pm\sqrt{2}$ (c) $\pm 1/2$ (d) $\pm 3/2$

63. The line parallel to the x-axis and passing through the intersection of the lines $ax + 2by + 3b = 0$ and $bx - 2ay - 3a = 0$, where $(a, b) \neq (0, 0)$ is :
(a) above the x-axis at a distance of (2/3) from it (b) above the x-axis at a distance of (3/2) from it
(c) below the x-axis at a distance of (2/3) from it (d) below the x-axis at a distance of (3/2) from it

64. If non-zero numbers a, b, c are in HP, then the straight line $\frac{x}{a}+\frac{y}{b}+\frac{1}{c}=0$ always passes through a fixed point. That point is:
(a) $\left(1, -\frac{1}{2}\right)$ (b) (1, – 2) (c) (– 1, – 2) (d) (– 1, 2)

65. If a vertex of a triangle is (1, 1) and the mid points of two sides through this vertex are (– 1, 2) and (3, 2), then the centroid of the triangle is :
(a) $\left(\frac{1}{3}, \frac{7}{3}\right)$ (b) $\left(1, \frac{7}{3}\right)$ (c) $\left(-\frac{1}{3}, \frac{7}{3}\right)$ (d) $\left(-1, \frac{7}{3}\right)$

66. The equation of the straight line passing through the point (4, 3) and making intercepts on the coordinate axes whose sum is – 1, is :
(a) $\frac{x}{2}+\frac{y}{3}=-1$ and $\frac{x}{-2}+\frac{y}{1}=-1$ (b) $\frac{x}{2}-\frac{y}{3}=-1$ and $\frac{x}{-2}+\frac{y}{1}=-1$
(c) $\frac{x}{2}+\frac{y}{3}=1$ and $\frac{x}{-2}+\frac{y}{1}=1$ (d) $\frac{x}{2}-\frac{y}{3}=1$ and $\frac{x}{-2}+\frac{y}{1}=1$

67. If the equation $2x^2 - xy - y^2 - 11x - 5y + d = 0$ represents pair of line then value of d is :
(a) 35 (b) 28 (c) 7 (d) 14

68. The locus of the orthocentre of the triangle formed by the lines $(1 + p)\,x - py + p\,(1 + p) = 0$, $(1 + q)\,x - qy + q\,(1 + q) = 0$ and $y = 0$, where $p \neq q$, is :
(a) a hyperbola (b) a parabola (c) an ellipse (d) a straight line

69. If one of the lines given by $6x^2 - xy + 4cy^2 = 0$ is $3x + 4y = 0$, then c equals :

(a) 1 (b) – 1 (c) 3 (d) – 3

70. If the equation of the locus of a point equidistant from the points (a_1, b_1) and (a_2, b_2) is $(a_1 - a_2)x + (b_1 - b_2)y + c = 0$, then tje value of '$c$' is :

(a) $\frac{1}{2}(a_2^2 + b_2^2 - a_1^2 - b_1^2)$ (b) $a_1^2 - a_2^2 + b_1^2 - b_2^2$ (c) $\frac{1}{2}(a_1^2 + a_2^2 + b_1^2 + b_2^2)$ (d) $\sqrt{a_1^2 + b_1^2 - a_2^2 - b_2^2}$

71. If $\Delta = \begin{vmatrix} a & h & g \\ h & b & f \\ g & f & c \end{vmatrix}$ then condition of parallel line is :

(a) $\Delta = 0$ (b) $h^2 = ab$ (c) $a + b = 0$ (d) None of these

72. If the pair of straight lines $x^2 - 2pxy - y^2 = 0$ and $x^2 - 2qxy - y^2 = 0$ be such that each pair bisects the angle between the other pair, then :

(a) $p = q$ (b) $p = -q$ (c) $pq = 1$ (d) $pq = -1$

73. The equation $ax^2 + by^2 + 2hxy$ will represent a pair of perpendicular lines then :

(a) $a + b = 1$ (b) $h^2 = ab$ (c) $a + b = 0$ (d) None of these

74. The condition for the expression $ax^2 + 2hxy + by^2 + 2yx + 2fy + c = 0$ be resolved into linear factor is :

(a) $\begin{vmatrix} a & h & g \\ h & b & f \\ g & f & c \end{vmatrix} = 0$ (b) $\begin{vmatrix} a & h & f \\ h & b & g \\ f & g & c \end{vmatrix} = 0$ (c) $\begin{vmatrix} a & h & g \\ h & f & b \\ g & c & f \end{vmatrix} = 0$ (d) None of these

75. If $ax^2 + 2bxy + by^2 + 2gx + 2fy + c = 0$ represent to a pair of parallel lines, then the distance between then :

(a) $\sqrt{\frac{g^2 - ac}{n^2 + a^2}}$ (b) $2\sqrt{\frac{g^2 - ac}{a(a+b)}}$ (c) $\sqrt{\frac{g^2 + ac}{a(a+b)}}$ (d) $2\sqrt{\frac{g^2 + ac}{a(a+b)}}$

76. The distance between the pair of line represented by the equation $x^2 - 6xy + 9y^2 + 3x - 9y - 4 = 0$ is :

(a) $\frac{15}{\sqrt{10}}$ (b) $\frac{1}{2}$ (c) $\sqrt{\frac{5}{2}}$ (d) $\frac{1}{\sqrt{10}}$

77. The equation $x^3 - 3xy + xy^2 + 3x - 5y + 2 = 0$. When λ whom λ is real number represent pair of straight lines. If θ is the angle between lines, then $\text{cosec}^2\,\theta$ equal to :

(a) 3 (b) 4 (c) 10 (d) 100

78. $\frac{1}{ab'} + \frac{1}{ba'} = 0$ then lines $\frac{x}{a} + \frac{y}{b} = 1$ and $\frac{x}{a'} + \frac{y}{b'} = 1$ are :

(a) parallel (b) inclined at 60° to each other

(c) perpendicular to each other (d) None of these

79. A variable straight line $\frac{x}{a} + \frac{y}{b} = 1$ is such that $a + b = 10$ the locus of the middle point of the line which is intercept between the axes is :

(a) $x + y = 10$ (b) $x + y = 0$ (c) $x + y = 5$ (d) $x + y = 1$

80. The line L given by $\frac{x}{5} + \frac{y}{b} = 1$ passes through the point (13, 32). The line K is parallel to L and has the equation $\frac{x}{c} + \frac{y}{3} = 1$. Then the distance between L and K is :

(a) $\frac{23}{\sqrt{17}}$ (b) $\frac{23}{\sqrt{15}}$ (c) $\sqrt{17}$ (d) $\frac{17}{\sqrt{15}}$

81 The foot of perpendicular of point (1, 2) on the one straight line $2x + 3y + 4 = 0$ is :

(a) $\left(\frac{-11}{3} \frac{-10}{13}\right)$ (b) $\left(\frac{-11}{13}, \frac{10}{3}\right)$ (c) $\left(\frac{10}{3}, \frac{1}{2}\right)$ (d) None of these

82. The equation of the line through the point (2, 3) such that its segment intercepted by the lines $3x + 4y = 1$, $3x + 4y = 5$ is of length 1 is :

(a) $x + 2 = 0$ (b) $x - 2 = 0$ (c) $y + 3 = 0$ (d) $y - 3 = 0$

83. The points $(-a, -b)$, $(0, 0)$, (a, b) and (a^2, ab) are :
(a) Collinear (b) vertices of a rectangle
(c) vertices of a parallelogram (d) none of the above

84. The straight lines $x + y = 0$, $3x + y - 4 = 0$, $x + 3y - 4 = 0$, form a triangle which is :
(a) isosceles (b) equilateral
(c) right angled (d) None of these

85. The three lines $px + qy + r = 0$, $qx + ry + p = 0$, $rx + py + q = 0$ are concurrent if :
(a) $p + q + r = 1$ (b) $p^2 + q^2 + r^2 = pr + rq$
(c) $p^3 + q^3 + r^3 = 3pqr$ (d) None of the above

86. The orthocentre of the triangle formed by the lines $x = 0$, $y = 0$ and $x + y = 1$ is :
(a) $\left(\frac{1}{2}, \frac{1}{2}\right)$ (b) $\left(\frac{1}{3}, \frac{1}{3}\right)$ (c) (0, 0) (d) $\left(\frac{1}{4}, \frac{1}{4}\right)$

87. The number of integer values of m, for which the x-coordinate of the point of Intersection of the lines $3x + 4y = 9$ and $y = mx + 1$ is also an integer, is :
(a) 2 (b) 0 (c) 4 (d) 1

88. Let $0 < \alpha < \frac{\pi}{2}$ be a fixed angle. If $P = (\cos\theta, \sin\theta)$ and $Q = ((\cos\alpha - \theta), \sin(\alpha - \theta)$ then θ is obtained from P by :
(a) clockwise rotation around origin through an angle α
(b) anti clock wise rotation around origin through an angle α
(c) reflection in the line through origin with slope $\tan\alpha$
(d) reflection in the line through origin with slope $\tan\frac{\alpha}{2}$

89. Consider three points $P = (-\sin(\beta - \alpha), -\cos\beta)$, $Q + (\cos(\beta - \alpha), -\sin\beta)$ and $R = (\cos(\beta - \alpha + \theta))$, $\sin(\beta - \theta)$, where $0 < \alpha, \beta, \theta < \pi/4$. Then :
(a) P lies on the line segment RQ (b) Q lies on the segment PR
(c) R lies on the line segment QP (d) P, Q, R are non-collinear

90. The equation of second degree $x^2 + 2\sqrt{2}\, xy + 2y^2 + 4x + 4\sqrt{2}y + 1 = 0$ represents a pair of straight lines. The distance between them is :
(a) 4 (b) $\frac{4}{\sqrt{3}}$ (c) 2 (d) $2\sqrt{3}$

91. The angle between the pair of straight lines $y^2 \sin^2\theta - xy \sin^2\theta + x^2(\cos^2\theta - 1) = 1$, is :
(a) $\frac{\pi}{3}$ (b) $\frac{\pi}{4}$ (c) $\frac{2\pi}{3}$ (d) None of these

92. If the angle between the two lines represented by $2x^2 + 5xy + 3y^2 + 6x + 7y + 4 = 0$ is $\tan^{-1}(m)$, then m is equal to :
(a) $\frac{1}{2}$ (b) 1 (c) $\frac{1}{5}$ (d) 7

93. The line joining origin and point of intersection of curves $ax^2 + 2hxy + by^2 + 2gx = 0$ and $a_1x^2 + 2h_1xy + b_1y^2 + 2g_1x = 0$ will be mutually perpendicular, if :
(a) $g(a_1 + b_1) = g_1(a + b)$ (b) $g(a + b) = g_1(a_1 + b_1)$
(c) $a + b = gg_1(a_1 + b_1)$ (d) $ag = a_1g_1 = bg + b_1g_1$

94. Out of two straight lines represented by an equation, $ax^2 + 2hxy + by^2 = 0$, if one is $y = mx$, then :
(a) $a + 2hm + bm^2 = 0$ (b) $b + 2hm + am^2 = 0$ (c) $h + 2am + bm^2 = 0$ (d) $b + 2hm - am^2 = 0$

95. The angle between the straight lines is $x^2 - y^2 - 2y - 1 = 0$:
(a) 90° (b) 60° (c) 75° (d) 36°

96. The equation $y^2 - x^2 + 2x - 1 = 0$ is :
(a) hyperbola (b) ellipse
(c) pair of straight lines (d) rectangular hyperbola

97. If the vertices P, Q, R of a triangle PQR are rational points which of the following points of the triangle PQR

(are) always rational point(s) ?

(a) centroid (b) incentre (c) circumcentre (d) orthocentre

98. If (α, α^2) lies inside the triangle formed by the lines $2x + 3y - 1 = 0$, $x + 2y - 3 = 0$, $5x - 6y - 1 = 0$, then :

(a) $2\alpha + 3\alpha^2 - 1 > 0$ (b) $\alpha + 2\alpha^2 - 3 < 0$ (c) $\alpha + 2\alpha^2 - 3 < 0$ (d) $6\alpha^2 - 5\alpha + 1 > 0$

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

(a) 2 (b) 1 (c) – 1 (d) none of these

CIRCLE

100. The line joining the centres of the circles $x^2 + y^2 - 2x + 4y + 1 = 0$ and $2x^2 + 2y^2 - 2y + 4x + 1 = 0$ is given by :

(a) $x - y = 3$ (b) $x + y + 1 = 0$ (c) $5x + 4y = 3$ (d) $5x + 4y + 3 = 0$

101. If $3x - 4y + 5 = 0$ and $6x - 8y - 15 = 0$ are tangents to the same circle, then radius of the circle is :

(a) 5/2 (b) 5/4 (c) 5 (d) 10

102. The number of points with integral coordinates that are interior to the circle $x^2 + y^2 = 17$ is :

(a) 45 (b) 49 (c) 53 (d) 57

103. The equation of the circle passing through (1, 0) and (0,1) and having smallest possible radius is :

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

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

104. The four distinct points (1, 1), (1, 3), (3, 1) and $(k, 3k)$ lie on a circle for :

(a) No value of k (b) A unique value of k

(c) Exactly two values of k (d) Infinite of values of k

105. 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 $\angle QPR$ is equal to :

(a) $\pi/2$ (b) $\pi/3$ (c) $\pi/4$ (d) $\pi/6$

106. For each natural number k, let C_k denote the circle with radius k centimeters and centre at the origin. On the circle C_k, a particle moves k centimeters in the counter-clockwise direction. After completing its motion on C_k, particle moves to C_{k+1} in the radical direction. The motion of the particle continues in this manner. The particle starts at (1, 0). If the particle crossing the positive direction of the x-axis for the first time on the circle C_n then $n = \ldots\ldots$

(a) 5 (b) 6 (c) 7 (d) 3

107. If abscissae of two points A and B are the roots of the equation $x^2 + 5x + 1 = 0$ and their ordinates are the roots of the equation $x^2 + x - 5 = 0$ then equation of the circle with AB as diameter is :

(a) $x^2 + y^2 + 5x + 5y = 0$ (b) $x^2 + y^2 + 5x + 5y + 2 = 0$

(c) $x^2 + y^2 + 5x + 5y - 2 = 0$ (d) $x^2 + y^2 + 5x + y - 4 = 0$

108. The abscissae of two points A and B are roots of the equation $x^2 + 2ax - b^2 = 0$ and their ordinates are the roots of the equation $x^2 + 2px - q^2 = 0$. The centre of the circle with AB as diameter is :

(a) (a, p) (b) (a, b) (c) $(-a, -p)$ (d) (p, q)

109. Equation of tangent/tangents from the point (–1, – 3) to the circle $x^2 + y^2 = 1$ is given by :

(a) $4x - 3y - 5 = 0$ (b) $4x - 3y - 5 = 0$ and $x + 1 = 0$

(c) $4x - 3y - 5 = 0$ and $y + 3 = 0$ (d) $4x - 3y + 5 = 0$ and $3x - 4y + 5 = 0$

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

(a) (3/2, 1/2) (b) (1/2, 3/2) (c) (1/2, 1/2) (d) $(1/2, -2^{1/2})$

111. The locus of the centre of a circle which touches externally the circle $x^2 + y^2 - 6x - 6y + 14 = 0$ and also touches the y-axis is given by the equation :

(a) $x^2 - 6x - 10y + 14 = 0$ (b) $x^2 - 10x - 6y + 14 = 0$

(c) $y^2 - 6x - 10y + 14 = 0$ (d) $y^2 - 10x - 6y + 14 = 0$

112. The circles $x^2 + y^2 + 2x - 4y + 1 = 0$ and $x^2 + y^2 - 4x + 4y - 1 = 0$:

(a) Intersect orthogonally (b) Touch internally (c) Touch externally (d) Neither intersect nor touch

113. 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 points, then :

(a) $2 < r < 8$ (b) $r < 2$ (c) $r = 2$ (d) $r < 2$

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

(a) $2c = a - b$ (b) $2c^2 = (a - b)^2$ (c) $c^2 = 2(a - b)^2$ (d) $c^2 = (a + b)^2$

115. The circles $x^2 + y^2 + 2x - 4y + 1 = 0$ and $(x + 4)^2 + (y + 2)^2 = r^2$ intersect each other in the two distinct points for

(a) $r < 3$ (b) $r > 7$ (c) $2 < r < 8$ (d) None of these

116. Number of common tangents to the circles $x^2 + y^2 - 2x + 4y - 4 = 0$ and $x^2 + y^2 - 8x - 4y + 16 = 0$ is :

(a) 1 (b) 2 (c) 3 (d) 4

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

(a) 0 (b) 1 (c) 3 (d) 4

118. The equation of the tangent to the circle $x^2 + y^2 - 4x - 6y = 0$ parallel to $x + y - 8 = 0$ is :

(a) $x + y = 5 + \sqrt{2}$ (b) $x + y = 5\sqrt{2}$ (c) $x + y = 5 - \sqrt{2}$ (d) $x + y = 5 - \sqrt{26}$

119. The pole of the straight line $9x + y - 28 = 0$ with respect to the circle $2x^2 + 2y^2 - 3x + 5y - 7 = 0$ is :

(a) (3, 1) (b) (1, 3) (c) (3, – 1) (d) (– 3, 1)

120. If the tangent at the point P on the circle $x^2 + y^2 + 6x + 6y = 2$ meets the straight line $5x - 2y + 6 = 0$ at a point Q on the y-axis, then the length of PQ is :

(a) 4 (b) $2\sqrt{5}$ (c) 5 (d) $3\sqrt{5}$

121. Let C_1 be the circle $x^2 + y^2 - 2x - 4y - 4 = 0$ and C_2 be the circle $x^2 + y^2 + 6x + 2y + 1 = 0$; then polar of the point (1, 1) with respect to circle C_1:

(a) Does not intersect C_2 (b) Touches C_2

(c) Intersect C_2 in two distinct points (d) None of these

122. For what values of k and λ are the points of intersection of the lines $2x + 3y + k = 0$ and $\lambda x + 2y + 1 = 0$ with axes concyclic :

(a) $\lambda = 3, k = 3$ (b) $\lambda = 2, k = 2$ (c) $\lambda = 2, k = 3$ (d) $\lambda = 3$, for any value of k

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

(a) $a_1b_1 = a_2b_2$ (b) $a_1a_2 = b_1b_2$ (c) $a_1 + a_2 = b_1 + b_2$ (d) $a_1 - a_2 = b_1 - b_2$

124. The shortest distance of the chord of contact of tangents from the point (10, 3) to the circle $x^2 + y^2 - 2x + 4y - 1 = 0$ is :

(a) $99/\sqrt{109}$ (b) $99/\sqrt{106}$ (c) $97/\sqrt{109}$ (d) $100/\sqrt{106}$

125. The area of a quadrilateral formed by a pair of tangents from the point (4, 5) to the circle $(x - 2)^2 + (y - 1)^2 = 16$ with a pair of radii where tangents touch the circle is :

(a) 2 (b) 4 (c) 8 (d) 16

126. The length of the chord cut-off by the line $2x + 3y = 6$ from the circle $x^2 + y^2 - 4x + 1 = 0$ is :

(a) $\sqrt{\frac{35}{13}}$ (b) $\sqrt{\frac{70}{13}}$ (c) $\sqrt{\frac{140}{13}}$ (d) None of these

127. Length of chord on the line $4x - 3y - 10 = 0$ cut off by the circle $x^2 + y^2 - 2x + 4y - 4 = 0$ is :

(a) 10 (b) 6 (c) 12 (d) None of these

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

(a) 1 (b) 3 (c) 4 (d) 7

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

(a) $\left(\frac{1}{2}, 1/4\right)$ (b) $\left(-2, \frac{1}{4}\right)$ (c) $\left(\frac{1}{4}, \frac{1}{2}\right)$ (d) None of these

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

(a) $p^2 = q^2$ (b) $p^2 = 8q^2$ (c) $p^2 < 8q^2$ (d) $p^2 > 8q^2$

131. If θ is the angle between the tangents drawn from (1, – 1) to the circle $(x + 2)^2 + (y - 1)^2 = 9$ then $\sin\theta =$

(a) 5/13 (b) 7/13 (c) 12/13 (d) 1

132. The locus of midpoints of the chords of the circle $x^2 + y^2 = 4$ which subtends a right angle at the centre is :

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

133. The locus of point of intersection of perpendicular tangents to the circle $x^2 + y^2 = 6$ is :

(a) $x^2 + y^2 = 12$ (b) $x^2 + y^2 = 6\sqrt{2}$ (c) $x^2 - y^2 = 12$ (d) $x^2 - y^2 = 6\sqrt{2}$

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

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

135. The angle between the pair of tangents drawn from the origin to the circle $(x-7)^2 + (y+1)^2 = 25$:
(a) $\pi/3$ (b) $\pi/6$ (c) $\pi/2$ (d) $\pi/4$

136. The angle between a pair of tangents drawn from a point P to the circle,
$x^2 + y^2 + 4x - 6y + 9\sin^2\alpha + 13\cos^2\alpha = 0$ is 2α. The equation of the locus of the point P is :
(a) $x^2 + y^2 + 4x - 6y + 4 = 0$ (b) $x^2 + y^2 + 4x - 6y - 9 = 0$
(c) $x^2 + y^2 + 4x - 6y - 4 = 0$ (d) $x^2 + y^2 + 4x - 6y + 9 = 0$

137. If the circle $x^2 + y^2 + 2x + 2ky + 6 = 0$ and $x^2 + y^2 + 2ky + k = 0$ intersect orthogonally then k is :
(a) 2 or $\frac{-3}{2}$ (b) -2 or $\frac{-3}{2}$ (c) 2 or $\frac{3}{2}$ (d) -2 or $\frac{3}{2}$

138. Two circles of equal radius r cut orthogonally. If their centres are (2, 3) and (5, 6) then $r =$
(a) 1 (b) 2 (c) 3 (d) 4

139. If a circle passes through the point (a, b) and cuts the circle $x^2 + y^2 = k^2$ orthogonally, then the equation of the locus of its centre is :
(a) $2ax + 2by - (a^2 + b^2 + k^2) = 0$ (b) $2ax + 2by - (a^2 - b^2 + k^2) = 0$
(c) $x^2 + y^2 - 3ax - 4by + (a^2 - b^2 - k^2) = 0$ (d) $x^2 + y^2 - 2ax - 3by + (a^2 + b^2 - k^2) = 0$

140. The radical centre of the three circles described on the three sides of a triangle as diameter is :
(a) Orthocentre (b) Circumcentre (c) Incentre (d) Centroid

141. Equation of the circle which is orthogonal to each of the circles $x^2 + y^2 - 2x - 4y + 4 = 0$, $2x^2 + 2y^2 - 2x - 11y + 13 = 0$, $3x^2 + 3y^2 - 3x - 7y - 9 = 0$ is :
(a) $(x-2)^2 + (y-3)^2 = 1$ (b) $(x+1)^2 + (y-1)^2 = 4$ (c) $(x+1)^2 + (y-3)^2 = 1$ (d) None of these

142. (2, 1) and (– 5, – 6) are the limiting points of a system of co-axial circles. If circle $x^2 + y^2 - 6x - 6y + k = 0$ belongs to the system then $k =$
(a) –1 (b) –8 (c) –5 (d) –7

143. One of the limiting points of the coaxial system of circles containing the circles $x^2 + y^2 - 4x - 10y + 15 = 0$ and $x^2 + y^2 - 8y + 14 = 0$ is :
(a) (– 2, 3) (b) (– 1, 1) (c) (4, – 6) (d) None of these

144. If the circumference of the circle $x^2 + y^2 - 2x + 8y - q = 0$ is bisected by the circle $x^2 + y^2 + 4x + 22y + q = 0$ then q equals:
(a) 0 (b) 25 (c) – 50 (d) – 25

145. If the equations of four circles are $(x \pm 4)^2 + (y \pm 4)^2 = 4^2$, then the radius of the smallest circle touching all the four circles is :
(a) $4(\sqrt{2}+1)$ (b) $4(\sqrt{2}-1)$ (c) $2(\sqrt{2}-1)$ (d) None of these

146. The intercept on the line $y = x$ by the circle $x^2 + y^2 - 2x = 0$ is AB. Equation of the circle with AB as a diameter is :
(a) $x^2 + y^2 + x + y = 0$ (b) $x^2 + y^2 - x - y = 0$ (c) $x^2 + y^2 + x - y = 0$ (d) None of these

147. The line $y = mx + c$ intersects the circle $x^2 + y^2 = r^2$ at the two real distinct points if :
(a) $-r\sqrt{1+m^2} < c < r\sqrt{1+m^2}$ (b) $-c\sqrt{1-m^2} < r < c\sqrt{1+m^2}$
(c) $-r\sqrt{1-m^2} < c < r\sqrt{1+m^2}$ (d) None of these

148. If the distances from the origin of the centre of the three circles $x^2 + y^2 + 2\alpha_i x = a^2$ $(i = 1, 2, 3)$ are in G.P., then the lengths of the tangents drawn to them from any point on the circles $x^2 + y^2 = a^2$ are in :
(a) A.P. (b) G.P. (c) H.P. (d) None of these

QUESTION BASED ON INTERMEDIATE

149. If the line passes through (– 4, 5) and (– 5, 7), also pass through (l, m) then :
(a) $l + m + 3 = 0$ (b) $2l + m + 3 = 0$ (c) $l + m - 3 = 0$ (d) None of these

150. The length of the sum of square at intercept cut by the line $x\sin\alpha + y\cos\alpha = \sin 2\alpha$ on the axis is :
(a) 1 unit (b) 2 unit (c) 3 unit (d) 4 unit

151. The distance between the parallel lines $ax + by + c = 0$ and $K(ax + by) + d = 0$ is :
(a) $\frac{c-d}{\sqrt{a^2+b^2}}$ (b) $\frac{c-(d/K)}{\sqrt{a^2+b^2}}$ (c) $\frac{Kc-d}{\sqrt{a^2+b^2}}$ (d) None of these

152. The distance from the origin to the line which pass through ($a\cos\alpha$, $a\sin\alpha$) and ($a\cos\beta$, $a\sin\beta$) is P then $\frac{P}{a}$ =:

(a) $\cos\frac{\alpha-\beta}{2}$ (b) $\sin\frac{\alpha-\beta}{2}$ (c) $2\cos\frac{\alpha-\beta}{2}$ (d) None of these

153. The x-coordinate of incentre of the triangle, whose sides mid point is (0, 1), (1, 1) and (1, 0) is :

(a) $2+\sqrt{2}$ (b) $2-\sqrt{2}$ (c) $1+\sqrt{2}$ (d) $1-\sqrt{2}$

154. In a triangle ABC, D is the mid-point of BC then $AB^2 + AC^2$ =

(a) $AD^2 + DC^2$ (b) $2(AD^2 + DC^2)$ (c) $3(AD^2 + DC^2)$ (d) None of these

155. If the point (a, b) (a', b') and $(a - a', b - b')$ are collinear then :

(a) $aa' = bb'$ (b) $ab' = a'b$ (c) $a'b' = ab$ (d) None of these

156. The equation of line passes through (3, 4) and the sum of intercepts on axis is 14 is :

(a) $4x - 3y = 24$ (b) $3x + 4y = 24$ (c) $4x + 3y = 24$ (d) None of these

157. If the lines $lx + my + n = 0$, $mx + ny + l = 0$ and $nx + ly + m = 0$ are concurrent then :

(a) $l + m + n = 0$ (b) $l - m + n = 0$ (c) $l + m - n = 0$ (d) $l + m + n = 1$

158. The angle between the straight lines $ax + by + c = 0$ and $(a + b)x - (a - b)y = 0$ is :

(a) $\frac{\pi}{2}$ (b) $\frac{\pi}{3}$ (c) $\frac{\pi}{4}$ (d) $\frac{\pi}{6}$

159. The product of two perpendiculars to the line $\frac{x}{a}\cos\theta + \frac{y}{b}\sin\theta = 1$ from the points $\left(\pm\sqrt{a^2-b^2}, 0\right)$ is :

(a) a^2 (b) b^2 (c) $a^2 - b^2$ (d) None of these

160. If we draw a circumcircle $x^2 + y^2 + 2gx + 2fy + c = 0$ of square. Then the side of square (if r is the radius of circle) is :

(a) r (b) $r\sqrt{2}$ (c) $\frac{1}{2}r$ (d) None of these

PAIRS OF STRAIGHTS

161. If the equation $9x^2 + 12xy + ky^2 = 0$ represents at coincident then find the value of k is :

(a) 3 (b) 4 (c) – 4 (d) None of these

162. If the equation $3x^2 - 8xy + by^2 = 0$ represents of perpendicular to the line. Then find the value of b is :

(a) 3 (b) – 3 (c) 0 (d) None of these

163. Find the angle of pair's of straight line is, $x^2 - 4xy + y^2 = 0$

(a) 30° (b) 60° (c) 45° (d) 90°

164. Find the angle between pairs of straight line, $x^2 - 2axy + (a^2 - 1)y^2 = 0$

(a) $\tan^{-1}(2/a^3)$ (b) $\tan^{-1}(2/a)$

(c) $\tan^{-1}(2/a^2)$ (d) None of these

165. Find the angle between pairs of straight line $(x^2 + y^2)\sin^2\alpha = (x\cos\theta - y\sin\theta)^2$:

(a) α (b) 2α (c) 3α (d) None of these

166. Find the maximum value of K for which the equation $2x^2 - xy + Ky^2 = 0$ represents two real lines is :

(a) $K \geq \frac{1}{8}$ (b) $K < \frac{1}{8}$ (c) $K \leq \frac{1}{8}$ (d) None of these

167. If the equation $6x^2 - 4xy + ay^2 = 0$ represents of perpendicular to the line then find the value of a is :

(a) 6 (b) – 6 (c) 5 (d) None of these

168. Find the angle between the pairs of straight line, $x^2 + 2xy\cot\theta - y^2 = 0$

(a) 45° (b) 60° (c) 90° (d) None of these

169. Find the angle between the pairs of straight line, $x^2 + 2xy\sec\phi + y^2 = 0$ is :

(a) 2ϕ (b) ϕ (c) ϕ/2 (d) None of these

170. The angle bisector of line $xy = 0$ is :

(a) $x^2 + y^2 = 0$ (b) $x^2 - y^2 = 0$ (c) $x^2 + 2y^2 = 0$ (d) None of these

171. Find the equation of coordinate is :

(a) $x = 0$ (b) $y = 0$ (c) $xy = 0$ (d) $xy = 1$

172. The pairs of straight line $x^2 - 2pxy - y^2 = 0$ and pairs of straight line $x^2 - 2q\,xy - y^2 = 0$ is angle bisector to each other is:

(a) $pq = -1$ (b) $pq = 1$ (c) $\frac{1}{p}+\frac{1}{q}=1$ (d) $\frac{1}{p}-\frac{1}{q}=0$

173. If $a + b = 0$ the pairs of straight line $ax^2 + 2bxy + by^2 = 0$ is angle between is :

(a) 90° (b) 60° (c) 27° (d) 180°

174. If pairs of straight line $2x^2 + 5xy + 3y^2 + 7y + 4 = 0$ the angle between $\tan^{-1} m$ then find the value of m is :

(a) $\frac{1}{5}$ (b) 1 (c) $\frac{7}{5}$ (d) 7

CIRCLE

175. The radius and centre of circle $x^2 + y^2 + 4x + 2y + 1 = 0$ is :

(a) 2 unit, $(-2, -1)$ (b) 3 unit $(-2, -1)$ (c) 2 unit, $(2, 1)$ (d) None of these

176. If $y = 2x$ is a chord of circle $x^2 + y^2 = 10x$. Then the equation of circle which has $y = 2x$ as a diameter is :

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

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

177. If any circle touches x-axis and cut an intercept on y-axis of length $2K$. Then the locus of its centre :

(a) $x^2 + y^2 = K^2$ (b) $x^2 - y^2 = K^2$ (c) $y^2 - x^2 = K^2$ (d) None of these

178. If circle $x^2 + y^2 - 4x - 6y + \lambda = 0$, touches x-axis, then λ is :

(a) 1 (b) 2 (c) 3 (d) 4

179. If the circles $x^2 + y^2 + 2ax + c = 0$ and $x^2 + y^2 + 2by + c = 0$ touches each other then :

(a) $\frac{1}{a^2}+\frac{1}{b^2}=\frac{1}{c}$ (b) $\frac{1}{a^2}+\frac{1}{b^2}=\frac{1}{c^2}$ (c) $\frac{1}{a^2}-\frac{1}{b^2}=\frac{1}{c}$ (d) None of these

180. The length of chords cuts by the circle $3x^2 + 3y^2 + 14x + 10y + 8 = 0$ on the axis are :

(a) $\frac{10}{3},\frac{2}{3}$ (b) $\frac{5}{3},\frac{2}{3}$ (c) $\frac{10}{3},\frac{1}{3}$ (d) $\frac{8}{3},\frac{5}{3}$

181. The centre of circle $4x^2 + 4y^2 - 10x + 5y = 0$ is :

(a) $\left(\frac{5}{4},\frac{-5}{8}\right)$ (b) $\left(\frac{-5}{4},\frac{5}{8}\right)$ (c) $\left(\frac{4}{5},\frac{-8}{5}\right)$ (d) $\left(\frac{-4}{5},\frac{8}{5}\right)$

182. The distance between the centres of two circles, $x^2 + y^2 + 4x + 6y + 1 = 0$ and $x^2 + y^2 + 6x + 4y + 1 = 0$ is :

(a) 1 (b) $\sqrt{2}$ (c) 2 (d) 4

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ANSWERS

1	2	3	4	5	6	7	8	9	10
a	b	d	a	b	c	d	c	a	d
11	12	13	14	15	16	17	18	19	20
b	c	a	a	a	c	a	b	b	a
21	22	23	24	25	26	27	28	29	30
d	d	d	b	c	b	a	b	d	d
31	32	33	34	35	36	37	38	39	40
b	c	a	a	c	a	b	d	d	c
41	42	43	44	45	46	47	48	49	50
b	d	b	c	c	a	d	b	b	c
51	52	53	54	55	56	57	58	59	60
d	c	a	d	d	c	c	c	a	c
61	62	63	64	65	66	67	68	69	70
c	a	d	b	b	d	d	d	d	d
71	72	73	74	75	76	77	78	79	80
b	d	c	a	b	c	a	c	c	a
81	82	83	84	85	86	87	88	89	90
a	b	a	a	c	c	a	a	d	c
91	92	93	94	95	96	97	98	99	100
d	c	a	a	a	c	a,c,d	a,d	b,c	d
101	102	103	104	105	106	107	108	109	110
b	b	c	c	c	c	d	c	b	d
111	112	113	114	115	116	117	118	119	120
d	c	a	a	d	c	b	d	c	c
121	122	123	124	125	126	127	128	129	130
a	d	b	d	c	c	b	a	a	d
131	132	133	134	135	136	137	138	139	140
c	c	a	a	c	d	a	c	a	a
141	142	143	144	145	146	147	148	149	150
a	b	a	b	b	b	a	b	b	b
151	152	153	154	155	156	157	158	159	160
b	a	b	b	b	c	a	c	b	b
161	162	163	164	165	166	167	168	169	170
b	b	b	c	b	b	b	c	b	b
171	172	173	174	175	176	177	178	179	180
c	a	a	a	a	d	c	d	a	a
181	182								
a	b								