Class 11th Mathematics

1. The angle between the lines joining the origin to the points of intersection of the line $x\sqrt{3} + y = 2$ and the curve $x^2 + y^2 = 4$ is

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

2. The chords of contact of the pairs 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) $\left(-\frac{1}{2},\frac{1}{4}\right)$ b) $\left(\frac{1}{2},-\frac{1}{4}\right)$ c) $\left(-\frac{1}{2},\frac{1}{4}\right)$ d) $\left(\frac{1}{2},\frac{1}{4}\right)$

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

   a) $r < 2$ b) $8 < r < 10$ c) $r = 2$ d) $2 < r < 8$

4. If the circles $x^2 + y^2 = 9$ and $x^2 + y^2 + 2ax + 2y + 1 = 0$ touch each other, then a is

   a) $-\frac{4}{3},\frac{4}{3}$ b) 0 c) 1 d) $\frac{5}{3},-\frac{5}{3}$

5. The co-ordinates of the point at which the circles $x^2 + y^2 - 4x - 2y - 4 = 0$ and $x^2 + y^2 - 12x - 8y - 36 = 0$ touch each other, are

   a) (3, -2) b) (-2, 3) c) (3, 2) d) none of these

6. The point on the straight line $y = 2x + 11$ which is nearest to the circle $16(x^2 + y^2) + 32x - 8y - 50 = 0$ is

   a) $\left(\frac{9}{2},2\right)$ b) $\left(-\frac{9}{2},2\right)$ c) $\left(\frac{9}{2},-2\right)$ d) none of these

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

   a) $2 < r < 8$ b) $r = 2$ or $r = 8$ c) $r < 2$ or $r <$ d) none of these

8. The extremities of the diameter of a circle have co-ordinates (-4, 3) and (12, -1) . The length of the intercept which the circle make on the y-axis is

   a) $\sqrt{2562}$ b) $2\sqrt{2}$ c) $4\sqrt{13}$ d) none of these

9. The length of the tangent from a point on the circle $x^2 + y^2 + 2gx + 2fy + c_1 = 0$ to the circle $x^2 + y^2 + 2gx + 2fy + c_2 = 0$ is

   a) $\sqrt{c_2 - c_1}$ b) $c_2 - c_1$ c) 0 d) $c_1 - c_2$

10. 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) $\frac{b}{a-2b}$

11. Two circles of equal radius r cut orthogonally. If their centre are (2, 3) and (5, 6) then r =

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

12. The angle between a pair of tangents 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 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) $x^2 + y^2 + 4x - 6y + 9 = 0$

13. If the abcissae and ordinates of two points P and Q are the roots of the equations $x^2 + 2ax - b^2 = 0$ and $x^2 + 2px - q^2 = 0$, respectively then the equation of the circle with PQ as diameter is

a) $x^2 + y^2 + 2ax + 2py - b^2 - q^2 = 0$ b) $x^2 + y^2 - 2ax - 2py + b^2 + q^2 = 0$

b) $x^2 + y^2 - 2ax - 2py - b^2 - q^2 = 0$ d) $x^2 + y^2 + 2ax + 2py + b^2 + q^2 = 0$

14. The total number of selections of fruit which can be made from 3 bananas, 4 apples and 2 oranges, is

a) 39 b) 315 c) 512 d) None of these

15. Five balls of different colours are to be placed in three boxes of different sizes. Each box can hold all five balls. In how many ways can we place the balls so that no box remains empty?

a) 50 b) 100 c) 150 d) 200

16. The interior angles of a regular polygon measure 160° each. The number of diagonals of the polygon are

a) 97 b) 105 c) 135 d) 146

17. A polygon has 44 diagonals, then the number of its sides are

a) 11 b) 7 c) 8 d) None of these

18. Assuming that no two consecutive digits are same. The number of n digit numbers is

a) $n!$ b) 9! c) 9^n d) n^9

19. The figure 4, 5, 6, 7, 8 are written in every possible order. The number of numbers greater than 56000 is

a) 72 b) 96 c) 90 d) 98

20. There are two urns. Urn A has 3 distinct red balls and urn B has 9 distinct blue balls. From each urn two balls are taken out at random and then transferred to the other. Then number of ways in which this can be done, is

a) 3 b) 36 c) 66 d) 108

21. The number of words that can be formed out of the letters of the words 'ARTICE' so that the vowels occupy even places, is

a) 574 b) 36 c) 754 d) 144

22. A car will hold 2 in the front seat and 1 in the rear seat. If among 6 persons 2 can drive, then number of ways in which the car can be filled, is

a) 10 b) 20 c) 30 d) None of these

23. In a cricket championship there are 36 matches. The number of terms, if each plays 1 match with other are

a) 9 b) 10 c) 8 d) 12

24. The number of all four digit numbers which are divisible by 4 that can be formed from the digits 1,2,3,4 and 5 is

a) 125 b) 30 c) 95 d) None of these

25. There are 10 points in a plane, out of these 6 are collinear. The number of triangles formed by joining these points is

a) 100 b) 120 c) 150 d) None of these

ANSWER KEY

1. (C)	2. (D)	3. (D)	4. (A)	5. (D)	6. (B)	7. (A)
8. (C)	9. (A)	10. (A)	11. (C)	12. (D)	13. (A)	14. (D)
15. (C)	16. (C)	17. (A)	18. (C)	19. (C)	20. (D)	21. (D)
22. (B)	23. (A)	24. (A)	25. (A)			