CIRCLES AND CONIC SECTION

1. The number of tangent(s) to the circle $x^2 + y^2 - 8x - 6y + 9 = 0$ which passes through (3, 2) is

   (a) two (b) one

   (c) zero (d) none of these

2. Equation of the circle having diameters $2x - 3y = 5$ and $3x - 4y = 7$ and having radius 8 is

   (a) $x^2 + y^2 + 2x + 2y - 31 = 0$

   (b) $x^2 + y^2 - 2x - 2y - 62 = 0$

   (c) $x^2 + y^2 - 2x + 2y - 62 = 0$

   (d) $x^2 + y^2 + 4x - 2y + 15 = 0$

3. One end of the diameter of the circle $x^2 + y^2 - 4x - 2y - 4 = 0$ is (-5, 6). Then the other end is

   (a) (5, 7) (b) $\left(4, \frac{5}{2}\right)$

   (c) (3, 7) (d) (9, - 4)

4. The length of the chord intercepted by the circle $x^2 + y^2 = 9$ and the line $x - y + 2 = 0$ is

   (a) $\sqrt{7}$ (b) $2\sqrt{7}$

   (c) $7\sqrt{2}$ (d) $4\sqrt{7}$

5. The equation of the tangent(s) to the circle $x^2 + y^2 - 6x + 4y = 12$ which is parallel to the given line $4x + 3y + 5 = 0$ is/are

   (a) 4x + 3y + 19 = 0

   (b) 4x + 3y – 31 = 0

   (c) Both (a) and (b)

   (d) none of these

6. The equation of the circle described on the line joining the points (3, 4) and (2, - 5) as its diameter is

   (a) $x^2 + y^2 + 5x + y - 14 = 0$

   (b) $x^2 + y^2 - 5x + y - 14 = 0$

   (c) $x^2 + y^2 - 5x - y + 28 = 0$

   (d) None of these

7. The Cartesian equation of the circle whose parametric representation is $x = 5 + 3\cos\theta$ and y = 7 + 3 sinθ, is

   (a) $(x-5)^2 + (y-7)^2 = 9$

   (b) $(x-5)^2 + (y-7)^2 = 3$

   (c) $(x+5)^2 + (y+7)^2 = 9$

   (d) None of these

8. Radii of the circles $x^2 + y^2 = 1, 2x^2 + 2y^2 - 6x - 2y - 3 = 0$ and $(x-3)^2 + (y-4)^2 = 4^2$ are in

   (a) AP

   (b) GP

   (c) HP

   (d) None of these

9. The length of the y-intercept made by the circle $x^2 + y^2 - 4x - 6y - 5 = 0$ is

   (a) 6 (b) $\sqrt{14}$

   (c) $2\sqrt{14}$ (d) 3

10. The circles $x^2 + y^2 - 12x - 12y = 0$ and $x^2 + y^2 + 6x + 6y = 0$

    (a) intersect at two points

    (b) touch each other externally

    (c) touch each other internally

    (d) none of these

11. A circle passing through (0, 0) and the centre lying on the line y = x, cuts $x^2+y^2-4x-6y+10=0$ orthogonally, is given by

(a) $x^2+y^2-4x-6y+10=0$

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

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

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

12. Two circles $x^2+y^2+px+py-7=0$ and $x^2+y^2-10x+2py+1=0$ will cut orthogonally p is equal to

(a) 1 (b) 2

(c) 4 (d) 6

13. An equation of a line passing through the point (-2, 11) and touching the circle $x^2+y^2=25$ is

(a) $4x+3y=125$

(b) $3x+4y=38$

(c) $24x-7y+125=0$

(d) $7x+24y-230=0$

14. The shortest distance between the circles $x^2+y^2=1$ and $x^2+y^2-10x-10y+41=0$ is

(a) $\sqrt{41}-1$ (b) 0

(c) $\sqrt{41}$ (d) $5\sqrt{2}-4$

15. Tangent to the circle $x^2+y^2=5$ at point (1, - 2) also touches the circle $x^2+y^2-8x+6y+20=0$, then the point of contact is

(a) (4, 3) (b) (-3, 1)

(c) (-3, - 4) (d) (3, - 1)

16. Two circles $x^2+y^2=6$ and $x^2+y^2-6x+8=0$ are given. The equation of circle through their point of intersection and (1, 1) is

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

(b) $x^2+y^2-6x+4=0$

(c) $x^2+y^2-3x+1=0$

(d) none of these

17. The equation of the circle having its centre on the line $x+2y-3=0$ passing through points of intersection of the circles $x^2+y^2-2x-4y+1=0$ and $x^2+y^2-4x-2y+4=0$ is

(a) $x^2+y^2-3x+4=0$

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

(c) $x^2+y^2-6x+7=0$

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

18. Equation of pair of tangents from the point (1, 2) to the circle $2x^2+2y^2-8x+12y+21=0$ is

(a) $45x^2-3y^2+20xy-130x-8y+73=0$

(b) $45x^2-3y^2+20xy-130x-9y+71=0$

(c) $3x^2-45y^2+20xy-130x-8y+1=0$

(d) none of these

19. The absciasse of the two points A and B are the 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 radius of the circle with AB as a diameter is

(a) $\sqrt{a^2+b^2+p^2+q^2}$

(b) $\sqrt{a^2+p^2}$

(c) $\sqrt{b^2+q^2}$

(d) none of these

20. The chord of contact of point (-3, 4) for circle $3x^2+3y^2=5$ is

(a) $-3x+4y=5$ (b) $-9x+12y=5$

(c) $9x-12y-5=0$ (d) $3x-4y=5$

21. If the radical centre of the circles $x^2+y^2+x+2y+3=0$, $x^2+y^2+2x+4y+5=0$ and $x^2+y^2+kx-8y-9=0$ is $\left(-\frac{2}{3},-\frac{2}{3}\right)$, then the value of k is

(a) - 3 (b) - 7

(c) 4 (d) - 4

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

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

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

(c) $x^2+y^2+2x-2y-62=0$

(d) $x^2+y^2-2x+2y-62=0$

23. The circle $x^2+y^2-8x+4y+4=0$ touches

(a) x-axis

(b) y-axis

(c) both axis

(d) neither x-axis nor y-axis

24. 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) $x^2+y^2-x-y=0$

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

25. A circle of radius 2 lies in the first quadrant and touches both the axes of coordinates. The equation of the circle with centre at (6, 5) and touching the above circle externally is

(a) $x^2+y^2-12x-10y+42=0$

(b) $x^2+y^2-12x-10y-52=0$

(c) $x^2+y^2-12x-10y+52=0$

(d) none of these

26. The circles $x^2+y^2-10x+16=0$ and $x^2+y^2=r^2$ intersect each other in two distinct points if

(a) $r<2$ (b) $r>8$

(c) $2<r<8$ (d) $2\le r\le 8$

27. If the chord of contact of tangents from a point on the circle $x^2+y^2=a^2$ to the circle $x^2+y^2=b^2$ touches the circle $x^2+y^2=c^2$, then *a, b, c* are in

(a) A.P. (b) G.P.

(c) H.P. (d) none of these

28. An equilateral triangle has two vertices (-2, 0) and (2, 0), and its third vertex lies below the *x-axis.* The equation of the circumcircle of the triangle is

(a) $\sqrt{3}(x^2+y^2)-4y+4\sqrt{3}=0$

(b) $\sqrt{3}(x^2+y^2)-4y-4\sqrt{3}=0$

(c) $\sqrt{3}(x^2+y^2)+4y+4\sqrt{3}=0$

(d) $\sqrt{3}(x^2+y^2)+4y-4\sqrt{3}=0$

29. For a two-degree equation $ax^2+2hxy+by^2+2gx+2fy+c=0$, to represent parabola, necessary and sufficient condition is

(a) $h^2<ab, \Delta\neq 0$

(b) $\Delta=0$, $h^2=ab$

(c) $\Delta\neq 0, h^2=ab$

(d) None of these

30. The focus, line of directrix and length of latus rectum for the parabola represented by $x^2 = -18y$ are respectively

(a) $\left(0, \frac{-9}{2}\right), y = -\frac{9}{2}, 18$

(b) $\left(0, \frac{9}{2}\right), y = \frac{-9}{2}, \frac{9}{2}$

(c) $\left(0, \frac{-9}{2}\right), y = \frac{9}{2}, 18$

(d) None of these

31. Point(s) on parabola $y^2 = 18x$, where y-coordinate is equal to three times the x-coordinates is/are

(a) (0, 0)

(b) (2, 6)

(c) (-2, 6)

(d) Both (a) and (b)

32. Equation of parabola whose vertex is (-1, -2), axis is vertical and which passes through (3, 6) is

(a) $y^2 + 5y = 3x + 1$

(b) $x^2 + 2x = 2y + 3$

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

(d) $x^2 + 2x = -2y + 3$

33. The point (1, 2) is one extremity of focal chord of parabola $y^2 = 4x$. The length of this focal chord is

(a) 2 (b) 4

(c) $\sqrt{5}$ (d) 8

34. For the ellipse $25x^2 + 16y^2 = 1600$, eccentricity is

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

(c) $\frac{4}{5}$ (d) None of these

35. The equation of the ellipse whose one focus is (6, 7), corresponding directrix is $x + y + 2 = 0$ and eccentricity is $\frac{1}{\sqrt{3}}$, is

(a) $5x^2 + 5y^2 + 2xy - 76x - 88y + 506 = 0$

(b) $5x^2 + 5y^2 - 2xy - 76x - 88y + 506 = 0$

(c) Either (a) or (b)

(d) None of these

36. The equation of the tangent to the ellipse $x^2 + 16y^2 = 16$ which makes an angle of 60^o with X-axis is

(a) $y = \sqrt{3x} + 7$ (b) $y = \sqrt{3x} - 7$

(c) $2y = 2\sqrt{3}x + 7$ (d) (a) and (b)

37. The equation of directrix of a hyperbola is x – y + 3 = 0. Its focus is (-1, 1) and eccentricity is 3. The equation of the hyperbola is

(a) $7x^2 + 7y^2 - 18xy + 50x - 50y + 77 = 0$

(b) $7x^2 - 7y^2 - 18xy + 50x - 50y + 77 = 0$

(c) $7x^2 + 7y^2 + 18xy - 50x + 50y - 77 = 0$

(d) None of these

38. The eccentricity of the hyperbola, the length of whose conjugate axis is $\frac{3}{4}$ of the length of transverse axis is

(a) $\frac{4}{5}$ (b) $\frac{5}{4}$

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

39. The equation of directrices of the hyperbola $25x^2 - 36y^2 = 225$ are given by

(a) $y = \pm\frac{18}{\sqrt{61}}$ (b) $x = \pm\frac{6}{\sqrt{61}}$

(c) $x = \pm\frac{18}{\sqrt{61}}$ (d) None of these

40. The equation(s) of the tangent(s) to the hyperbola $4x^2 - 9y^2 = 36$ which are parallel to the line $5x - 3y = 2$ is/are

(a) $5x - 3y = \sqrt{21}$

(b) $5x - 3y = -\sqrt{21}$

(c) $5x - 3y = \pm 3\sqrt{21}$

(d) None of these

41. If the focus is (4, 5) and line of directrix is x + 2y + 1 = 0, the equation of the parabla will be

(a) $x^2 + 4y^2 + 4xy + 124 = 0$

(b) $x^2 - 4y^2 + 54x - 42x - 4xy - 124 = 0$

(c) $4x^2 + y^2 - 4xy - 42x - 54y + 204 = 0$

(d) None of these

42. If x + y =k is normal to $y^2 = 12x$, then k =

(a) 3 (b) 6

(c) 9 (d) None of these

43. Consider a circle with its centre lying on the focus of the parabola $y^2 = 2px$ such that it touches the directrix of the parabola. Then a point of intersection of the circle and the parabola is

(a) $\left(\frac{p}{2}, \frac{p}{2}\right)$ (b) $\left(\frac{p}{2}, -p\right)$

(c) $\left(-\frac{p}{2}, p\right)$ (d) $\left(-\frac{p}{2}, -p\right)$

44. Find the equations of tangent and normal at the point of parabola $y^2 = 6x$ whose ordinate is 12.

(a) $y + x = 24$, $y + 4x = 108$ (b) $4y - x = 24$, $y + 4x = 108$

(c) $x + 4y = 24$, $4x + y = 108$ (d) $2y - x = 24$, $x + 2y = 108$

45. S and T are the foci of an ellipse and B is an end of the minor axis. If STB is an equilateral triangle then e is

(a) 1/4 (b) 1/2

(c) 3/2 (d) 1

46. If the normal at the end of a latus rectum of an ellipse of eccentricity 'e' passes through one end of the minor axis, then $e^2 + e^4 =$

(a) 1 (b) 2

(c) 3 (d) 4

47. Locus of a point which moves so that its distance from (4, 0) is twice its distance from x = 1 is

(a) $x^2 + y^2 - 3x = 16$

(b) $x^2 - 3y^2 = 12$

(c) $x^2 - 8x + y^2 = 20$

(d) $3x^2 - y^2 = 12$

48. The equation of the hyperbola for which eccentricity is 2, one of the focus is (2, 2) and corresponding directrix is x + y – 9 = 0 is

(a) $x^2 + y^2 + 4xy - 32x - 32y + 154 = 0$

(b) $x^2 - y^2 + 4xy - 32x + 32y + 154 = 0$

(c) $x^2 - y^2 - 4xy + 32x - 32y + 154 = 0$

(d) None of these

49. The equation $9x^2 - 16y^2 - 18x + 32y - 151 = 0$ represents

(a) pair of lines (b) parabola

(c) ellipse (d) hyperbola

50. In an ellipse, the distance between its foci is 6 and minor axis is 8. Then its eccentricity is

(a) $\frac{1}{\sqrt{5}}$ (b) $\frac{3}{5}$

(c) $\frac{1}{2}$ (d) $\frac{4}{5}$

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Answers

1. (c)	**2.** (c)	**3.** (d)	**4.** (b)	**5.** (c)	**6.** (b)	**7.** (a)	**8.** (b)	**9.** (c)	**10.** (b)
11. (b)	**12.** (b)	**13.** (c)	**14.** (d)	**15.** (d)	**16.** (c)	**17.** (a)	**18.** (a)	**19.** (d)	**20.** (b)
21. (b)	**22.** (a)	**23.** (b)	**24.** (c)	**25.** (c)	**26.** (c)	**27.** (b)	**28.** (d)	**29.** (c)	**30.** (c)
31. (d)	**32.** (b)	**33.** (b)	**34.** (b)	**35.** (b)	**36.** (d)	**37.** (a)	**38.** (b)	**39.** (c)	**40.** (c)
41. (c)	**42.** (c)	**43.** (b)	**44.** (b)	**45.** (b)	**46.** (a)	**47.** (d)	**48.** (a)	**49.** (d)	**50.** (b)