

- A circle is given by $x^2 + y^2 - 6x + 8y - 11 = 0$ and there are two points $(0, 0)$ and $(1, 8)$. These points lie

(a) one outside and one inside the circle (b) both inside the circle
 (c) both outside the circle (d*) one on and the other inside the circle
- Equation of common chord of the circles $x^2 + y^2 - 2x - 4y + 1 = 0$ and $x^2 + y^2 - 10x + 8y + 25 = 0$ is

(a) $2x - 3y - 6 = 0$ (b*) $2x + 3y + 6 = 0$
 (c) $x - 2y - 3 = 0$ (d) None of these
- One of the diameters of the circle circumscribing the rectangle ABCD is $4y = x + 7$. If A, B are the points $(-3, 4)$ and $(5, 4)$ respectively. Then the area of the rectangle is

(a*) 23 sq. units (b) 32 sq. units (c) 40 sq. units (d) None of these
- The equation of a circle whose centre is the point $(3, -1)$ and which cuts off a chord of length 6 units of the $2x - 5y + 18 = 0$ is

(a) $x^2 + y^2 - 6x + 2y - 28 = 0$ (b) $x^2 + y^2 + 6x - 2y + 28 = 0$
 (c*) $x^2 + y^2 + 6x - 2y - 28 = 0$ (d) $x^2 + y^2 + 6x + 2y + 28 = 0$
- The number of common tangents that can be drawn to the circles $x^2 + y^2 - 4x - 6y - 3 = 0$ and $x^2 + y^2 + 2x + 2y + 1 = 0$ is

(a) 1 (b*) 2 (c) 3 (d) 4
- Tangents OP and OQ are drawn from the origin O to the circle $x^2 + y^2 + 2gx + 2fy + c = 0$. Then the equation of the circumcircle of the triangle OPQ is

(a*) $x^2 + y^2 + 2gx + 2fy = 0$ (b) $x^2 + y^2 + gx + fy = 0$
 (c) $x^2 + y^2 - gx - fy = 0$ (d) $x^2 + y^2 - 2gx - 2fy = 0$
- If $3x + y = 0$ is a tangent to the circle with centre at the point $(2, -1)$, then the equation of the other tangent to the circle from the origin is

(a) $x - 3y = 0$ (b) $x + 3y = 0$ (c*) $3x - y = 0$ (d) $2x + y = 0$
- The angle between the tangents drawn from the origin to the circle $(x - 7)^2 + (y + 1)^2 = 25$ is

(a) $\pi/3$ (b) $\pi/6$ (c*) $\pi/2$ (d) $\pi/8$
- The distance between the chords of contact of the tangent to the circle $x^2 + y^2 + 2gx + 2fy + c = 0$ from the origin and the point (g, f) is

(a*) $g^2 + f^2$ (b) $\frac{1}{2}(g^2 + f^2 + c)$ (c) $\frac{g^2 + f^2 - c}{2\sqrt{(g^2 + f^2)}}$ (d) $\frac{g^2 + f^2 + c}{2\sqrt{(g^2 + f^2)}}$

10. The length of the tangent drawn from any pt. on the circle $x^2 + y^2 + 2gx + 2fy + c = 0$ to the circle $x^2 + y^2 + 2gx + 2fy + c_1 = 0$ is
 (a) $\sqrt{c_1 - c}$ (b*) $c - c_1$ (c) $\sqrt{c - c_1}$ (d) $c_1 - c$
11. The lines $3x - 4y + 4 = 0$ and $3x - 4y - 5 = 0$ are tangents to the same circle. The radius of this circle is
 (a) $9/5$ (b) $9/10$ (c*) $1/5$ (d) $1/10$
12. The equation of the chord of contact of the origin, w.r.t. circle. $x^2 + y^2 - 2x - 4y - 4 = 0$ is
 (a) $x + 2y + 4 = 0$ (b) $x + 2y - 4 = 0$
 (c) no chord of contact exist (d*) None of these
13. Equation of a circle drawn on the chord $2x + 3y = 13$ of the circle $x^2 + y^2 = 13$ as diameter is
 (a) $x^2 + y^2 - 4x - 6y + 13 = 0$ (b) $x^2 + y^2 + 4x + 6y + 13 = 0$
 (c*) $x^2 + y^2 - 4x + 6y + 13 = 0$ (d) None of these
14. A variable chord is drawn through the origin to the circle $x^2 + y^2 - 2ax = 0$. Locus of the centre of the circle drawn on this chord as diameter is
 (a*) $x^2 + y^2 + ay = 0$ (b) $x^2 + y^2 - ay = 0$
 (c) $x^2 + y^2 - ax = 0$ (d) $x^2 + y^2 + ax = 0$
15. The length of the chord of the circle $x^2 + y^2 = 25$, joining the points, tangents at which intersect at an angle of 120° is
 (a) 5 (b) $5/2$ (c*) 10 (d) None of these
16. From any point on the circle $x^2 + y^2 = a^2$ tangents are drawn to the circle $x^2 + y^2 = a^2 \sin^2 \alpha$. The angle between them is
 (a) $\alpha/2$ (b*) α (c) 2α (d) None of these
17. Tangent AB and AC are drawn from the point A (0, 1) to the circle $x^2 + y^2 - 2x + 4y + 1 = 0$. Equation of the circle through A, B and C is
 (a*) $x^2 + y^2 + x + y - 2 = 0$ (b) $x^2 + y^2 - x + y - 2 = 0$
 (c) $x^2 + y^2 + x - y - 2 = 0$ (d) None of these
18. The points of contact of tangents to the circle $x^2 + y^2 = 25$ which are inclined at an angle of 30° to the x-axis are
 (a) $\left(\pm \frac{5}{2}, \pm \frac{1}{2}\right)$ (b) $\left(\pm \frac{1}{2}, \pm \frac{5}{2}\right)$ (c) $\left(\pm \frac{2}{5}, \pm \frac{1}{2}\right)$ (d*) None of these
19. Tangents drawn from the point (4, 3) to the circle $x^2 + y^2 - 2x - 4y = 0$ are inclined at an angle
 (a*) $\pi/6$ (b) $\pi/4$ (c) $\pi/3$ (d) $\pi/2$
20. If $\left(m_i, \frac{1}{m_i}\right)$, $i = 1, 2, 3, 4$ are concyclic points, then the value of $m_1 m_2 m_3 m_4$ is
 (a*) 1 (b) -1 (c) 0 (d) None of these

21. If the line $hx + ky = 1$ touches $x^2 + y^2 = a^2$, then the locus of the point (h, k) is a circle of radius.

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

PRACTICE QUESTIONS

22. The area of the circle centred at $(1, 2)$ and passing through $(4, 6)$ is

- (a) 5π (b) 10π (c*) 25π (d) none of these

23. The centre of a circle passing through the 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*) $\left(\frac{1}{2}, -\sqrt{2}\right)$

24. The length of the chord cut off by $y = 2x + 1$ from the circle $x^2 + y^2 = 2$ is

- (a) $\frac{5}{6}$ (b) $\frac{6}{5}$ (c*) $\frac{6}{\sqrt{5}}$ (d) $\frac{\sqrt{5}}{6}$

25. Equation of a circle which passes through $(3, 6)$ and touches the axes is

- (a) $x^2 + y^2 + 6x + 6y + 3 = 0$ (b) $x^2 + y^2 - 6x - 6y - 9 = 0$
 (c*) $x^2 + y^2 - 6x - 6y + 9 = 0$ (d) none of these

26. If the points $(2, 0)$, $(0, 1)$, $(4, 5)$ and $(0, c)$ are concyclic, then the value of c is

- (a) 1 (b*) $14/3$ (c) 5 (d) none of these

27. Two perpendicular tangents to the circle $x^2 + y^2 = a^2$ meet at P . Then the locus of P has the equation

- (a*) $x^2 + y^2 = 2a^2$ (b) $x^2 + y^2 = 3a^2$ (c) $x^2 + y^2 = 4a^2$ (d) none of these

28. 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*) $2 < r < 8$ (b) $r < 2$ (c) $r = 2$ (d) $r > 2$

29. The common chord of $x^2 + y^2 - 4x - 4y = 0$ and $x^2 + y^2 = 16$ subtends at the origin an angle equal to

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

30. The equation of a tangent to the circle $x^2 + y^2 = 25$ passing through $(-2, 11)$ is

- (a) $4x + 3y = 25$ (b) $3x + 4y = 38$ (c*) $24x - 7y + 125 = 0$ (d) $7x + 24y = 230$