

CONIC SECTIONS

CM111001

1. Find the equation of the circle which passes through the point of intersection of the lines $3x-2y-1=0$ and $4x+y-27=0$ and whose centre is $(2,-3)$.
2. Find the equation of a circle whose diameters are $2x - 3y + 12 = 0$ and $x + 4y - 5 = 0$ and area is 154 square units.
3. Find the equation of the circle which passes through the origin and cuts off intercepts 3 & 4 from the positive parts of the axes respectively.
4. Find the equation of the image of the circle $x^2 + y^2 + 8x - 16y + 64 = 0$ in the line mirror $x = 0$.
5. Find the equation of the circle whose radius is 5 and which touches the circle $x^2 + y^2 - 2x - 4y - 20 = 0$ externally at the point $(5,5)$.
6. A circle of radius 2 lies in the first quadrant and touches both the axes. Find the equation of the circle with centre at $(6,5)$ and touching the above circle externally.
7. Show that the points $(3, -2)$, $(1,0)$, $(-1, -2)$ & $(1, -4)$ are concyclic.
8. Find the equation of the circle concentric with the circle $x^2 + y^2 - 6x + 12y + 15 = 0$ and double of its area.
9. Find the equation of the circle which touches the lines $4x - 3y + 10 = 0$ & $4x - 3y - 30 = 0$ and whose centre lies on the line $2x + y = 0$.
10. One diameter of the circle circumscribing the rectangle ABCD is $4y = x + 7$. If the coordinates of A and B are $(-3,4)$ and $(5,4)$ respectively, find the equation of the circle.
11. Find the equation of the circle circumscribing the triangle formed by the lines $x + y = 6$, $2x + y = 4$ and $x + 2y = 5$.
12. The line $2x - y + 6 = 0$ meets the circle $x^2 + y^2 - 2y - 9 = 0$ at A and B. Find the equation of the circle on AB as diameter.
13. Find the equation of the circle whose diameter is the line segment joining $(-4,3)$ & $(12, -1)$. Find also the intercept made by it on y-axis.
14. For the following parabolas find the coordinates of the foci, the equations of the directrices and the lengths of latus-rectum: (i) $y^2 = 8x$ (ii) $x^2 = 6y$ (iii) $y^2 = -12x$ (iv) $x^2 = -16y$.
15. Find the vertex, axis, focus, directrix, latus-rectum of the following parabolas. Also draw their rough sketch : (i) $y^2 - 8y - x - 19 = 0$ (ii) $4y^2 + 12x - 20y + 67 = 0$
16. Find the equation of the parabola whose focus is $(1,1)$ and tangent at the vertex is $x + y = 1$.

17. Find the locus of the middle points of all chords of the parabola $y^2 = 4ax$ which are drawn through the vertex.
18. An equilateral triangle is inscribed in the parabola $y^2 = 4ax$ whose vertex is at the vertex of the parabola. Find the length of its side.
19. A cable of a uniformly loaded suspension bridge hangs in the form of a parabola. The roadway which is horizontal and 100m long is supported by vertical wires attached to the cable, the longest wire being 30m and the shortest wire being 6m. Find the length of a supporting wire attached to the roadway 18m from the middle.
20. A rod AB of length 15cm rests in between two coordinate axes in such a way That the end pt A lies on x-axis and end point B lies on y-axis. A point is taken on the rod in such a way that AP=6cm. Show that the locus P is an ellipse. Also, find its eccentricity.
21. An arc is in the form of a semi-ellipse. It is 8m wide and 2m high at the centre. Find the height of the arch at a point 1.5m from one end.
22. A man is running in a race-course notes that the sum of the distances from the two flag posts from him is always 10m and the distance between the flag posts is 8m. Find the equation of the path traced by the man.

