CONIC SECTIONS- CIRCLES

1. Find the equation of the circle passing through the intersection of the lines $3x - 2y = 1$ and $4x + y = 27$ and whose centre is (2, -3) $\qquad$ ans: $x^2 + y^2 - 4x + 6y - 96 = 0$

2. Find the equation of the circle using the given conditions:
   i) centre: (2, -3) & r = 5 $\qquad$ ii) centre (- 1, 4) & r = ½

3. Find the equation of the circle which passes through (3, -2) , (-2, 0) and has its centre on the line $2x - y = 3$. $\qquad$ ans: $x^2 + y^2 + 3x + 12y + 2 = 0$

4. The end points of the diameter of a circle are (-1, 2) & (3, -4). Find the equation of the circle. $\qquad$ ans: $x^2 + y^2 - 2x + 2y - 11 = 0$

5. Find the equation of the circle passing through (5, -8), (2, -9) & (2, 1). $\qquad$ Ans: $x^2 + y^2 - 4x + 8y - 5 = 0$

6. Find the equation of the circle passing through (5, 7), (8, 1) & (1, 3). $\qquad$ Ans: $3x^2 + 3y^2 - 29x - 19y + 56 = 0$

7. Find the radius & centre of the following circles:
   i) $x^2 + y^2 - 4x + 6y - 5 = 0$ $\qquad$ ii) $4x^2 + 4y^2 + 16x + 20y - 23 = 0$
   $\qquad$ ans: i) (2,-3) & $3\sqrt{2}$ ii) (-2, -5/2) & 4

8. Find the equation of the circle which passes through the origin and cuts off intercepts -2 & 3 on the axes. $\qquad$ ans: $x^2 + y^2 + 2x - 3y = 0$

9. Find the equation of the circle which passes through the vertices of a triangle whose sides are $x + y = 2$; $3x - 4y = 6$; and $x - y = 0$. $\qquad$ ans: $x^2 + y^2 + 4x + 6y - 12 = 0$
   [hint: solve the equations pairwise simultaneously to get the vertices of the triangle. then find the eqn of the circle passing thru the 3 points.]

10. Show that the line $x + y = 5$ touches the circle $x^2 + y^2 - 2x - 4y + 3 = 0$. Also find the point of contact.
    [hint: use the formula to find the perpendicular distance of a point from a line studied in straight line chapter & show that this distance = the radius, hence touches]