

SELF ASSESSMENT TEST -8**CLASS B.A/B.SC-1**

ELLIPSE

1. Write down eqn of director circle of ellipse $16x^2 + 9y^2 = 144$.
2. Find the pole of the line $x - 2y + 3 = 0$ w.r.t. the ellipse $3x^2 + 4y^2 = 12$.
3. Show that the locus of the poles of tangents to the ellipse $4x^2 + y^2 = 4$ w.r.t. the ellipse $3x^2 + 4y^2 = 1$ is $9x^2 + 64y^2 = 1$.
4. Tangents are drawn from any pt on the circle $x^2 + y^2 = a^2$ to the ellipse. Prove that the locus of the middle pt of chords of contact is
$$\left(\frac{x^2}{a^2} + \frac{y^2}{b^2} \right)^2 = \frac{x^2 + y^2}{a^2}$$
 .
5. Tangents are drawn to the ellipse to meet the coordinate axes at P & Q, show that the midpt of segment PQ lies on the curve $\frac{a^2}{x} + \frac{b^2}{y} = 4$.
6. Prove that the normal at any pt of an ellipse bisects the angle between the focal distances of the pt.
7. Prove that the sum of the squares of conjugate semi diameters of an ellipse is constant and equal to the sum of squares of the semi axis of the ellipse.
8. If P & D be the conjugate diameters of the ellipse, show that the locus of the foot of perpendicular from the centre on PD is
$$2(x^2 + y^2)^2 = a^2 x^2 + b^2 y^2$$
 .