Practice Questions of Lecture 16 to 22

Q.1: Find the angle between the following pair of lines.

(a) $11x^2 + 16xy - y^2 = 0$

(b) $3x^2 + 7xy + 2y^2 = 0$

Q.2: For what value of λ will the following equation represent a pair of straight lines

$$4x^2 - 9y^2 - 2(8+\lambda)x - 18y = 29 + 2\lambda.$$

Q.3: Express the equation $r = 1 + \sin\theta$ in rectangular coordinates.

Q.4: Express the equation $r = a\cos\theta, a > 0$ in rectangular coordinate system.

Q.5: Find polar coordinates of the point P whose rectangular coordinates are (1, 1).

Q.6: Find Cartesian coordinates of the point P whose polar coordinates are $(16, 30^0)$.

Q.7: Find the eccentricity and length of semi-latus rectum of the conic $\frac{4}{r} = 5 + 4\sin\theta$.

Q.8: Identify the conic $\frac{4}{r} = 2 + \sin\theta$. Find also its eccentricity and the length of latus-rectum.

Q.9: Find the angle ψ for the polar curve $r = a(1 - \cos\theta)$ at $\theta = \frac{\pi}{2}$.

Q.10: Find the angle of intersection of the curves $r = 2$ *and* $r = 4\sin\theta$.