

CIRCLES

$$\Rightarrow x^2 + y^2 = r^2 \rightarrow \text{centre} = (0, 0)$$

$$\Rightarrow (x-a)^2 + (y-b)^2 = r^2 \rightarrow \text{centre} = a, b$$

$$\Rightarrow x^2 + y^2 + 2gx + 2fy + c = 0 \rightarrow \text{centre} = (-g, -f)$$

$$\text{Radius} = \sqrt{g^2 + f^2 - c}$$

Egⁿ of Circle in Diameters form

$$(x-x_1)(x-x_2) + (y-y_1)(y-y_2) = 0$$

Intercept $\rightarrow$

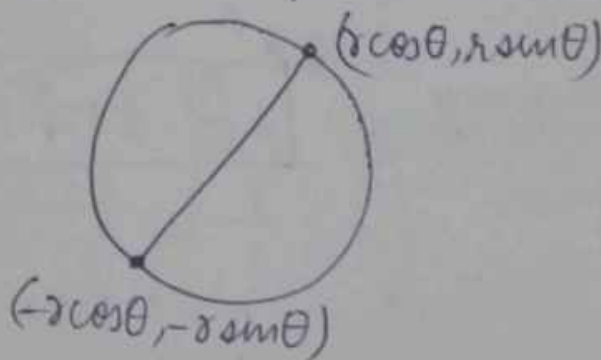
$$x \text{ Intercept} = 2\sqrt{g^2 - c}$$

$$y \text{ Intercept} = 2\sqrt{f^2 - c}$$

Parametric coordinates

$$(r \cos \theta, r \sin \theta)$$

Parametric coordinates of end pt of diameter



ELLIPSE

$$e < 1, a > b$$

$$a \left[\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1 \right]$$

$$LR = \frac{2b^2}{a}$$

$$\text{Focus} \rightarrow (\pm ae, 0)$$

$$\text{Directrix} \rightarrow x = \pm \frac{a}{e}$$

$$\left[\begin{array}{l} \text{Length of Major axis} = 2a \\ \text{" " Minor axis} = 2b \end{array} \right]$$

$$\text{Vertex} = (\pm a, 0)$$

$$\star b^2 = a^2(1 - e^2)$$

Ext of Latus Rectum

$$\left[\pm ae, \pm \frac{b^2}{a} \right]$$

S, S' — focus

$$PS + PS' = 2a$$

$$e < 1, b > a$$

$$\left[\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1 \right]$$

$$LR = \frac{2a^2}{b}$$

$$\text{Focus} = 0, \pm be$$

$$\text{Vertex} = 0, \pm b$$

$$\text{Directrix} \rightarrow y = \pm \frac{b}{e}$$

$$\left[\begin{array}{l} \text{Length of Major axis} = 2b \\ \text{Minor axis} = 2a \end{array} \right]$$

$$a^2 = b^2(1 - e^2)$$

$$\left[\pm \frac{a^2}{b}, \pm be \right]$$

$$PS + PS' = 2b$$