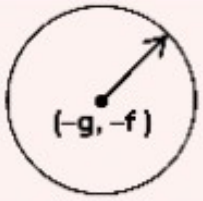
VARIOUS FORMS OF EQUATIONS OF CIRCLE

General Form

$x^2 + y^2 + 2gx + 2fy + c = 0$

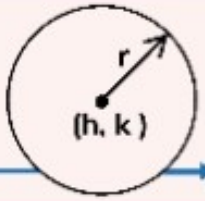


$r = \sqrt{g^2 + f^2 - c}$

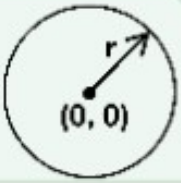
Centre Radius Form

$(x - h)^2 + (y - k)^2 = r^2$

Special case

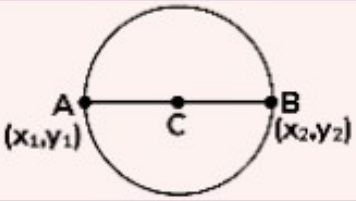


$x^2 + y^2 = r^2$



Diametric Form

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

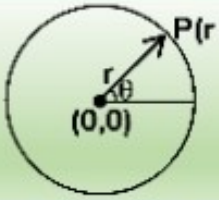


Parametric Form

$x^2 + y^2 = r^2$

$x = r\cos\theta$

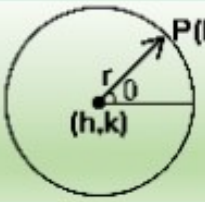
$y = r\sin\theta$



$(x - h)^2 + (y - k)^2 = r^2$

$x = h + r\cos\theta$

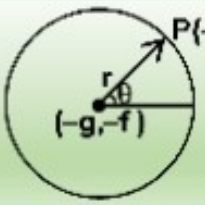
$y = k + r\sin\theta$



$x^2 + y^2 + 2gx + 2fy + c = 0$

$x = -g + \left(\sqrt{g^2 + f^2 - c}\right)\cos\theta$

$y = -f + \left(\sqrt{g^2 + f^2 - c}\right)\sin\theta$



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

POSITION OF A POINT P(x_1, y_1) w.r.t. CIRCLE

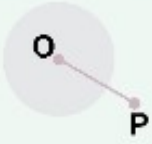
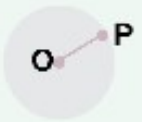
Circle : $S = x^2 + y^2 + 2gx + 2fy + C = 0$

$r = \sqrt{g^2+f^2-C}$

$P \equiv (x_1, y_1)$, $O \equiv (-g, -f)$

$S_1 = x_1^2 + y_1^2 + 2gx_1 + 2fy_1 + C$

Method I

$S_1 > 0$	$S_1 = 0$	$S_1 < 0$
Point lie outside Circle	Point lie on the Circle	Point lie inside Circle
		

Method II

Step I: Find distance OP using distance formula

Step II: Find radius using $r = \sqrt{g^2+f^2-C}$

OP > r	OP = r	OP < r