

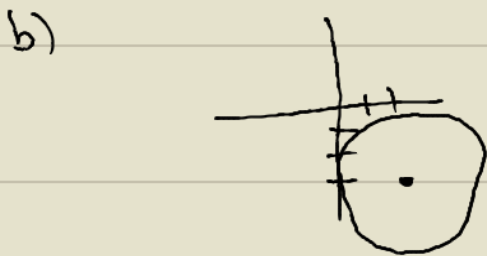
$$3. \quad x^2 + y^2 - 4x + 6y + 9 = 0$$

$$\underline{x^2 - 4x} + \underline{y^2 + 6y} = -9$$

$$\underline{x^2 - 4x + 4} + \underline{y^2 + 6y + 9} = -9 + 4 + 9$$

$$\begin{array}{ccc} (x-2)^2 + (y+3)^2 = 4 \\ \downarrow \qquad \qquad \downarrow \qquad \qquad \downarrow \\ h=2 \qquad \qquad k=-3 \qquad \qquad r=\sqrt{4} \\ \qquad \qquad \qquad \qquad \qquad \qquad r=2 \end{array}$$

a) CENTER = $(h, k) = (2, -3)$
RADIUS = $r = 2$



GENERAL FORM TO STANDARD FORM

1. GROUP X'S, GROUP Y'S, TAKE NUMBER TO RIGHT SIDE

2. COMPLETE THE SQUARE ON X'S
COMPLETE THE SQUARE ON Y'S

<u>X'S</u>	<u>Y'S</u>
$(-4 \cdot \frac{1}{2})^2$	$(6 \cdot \frac{1}{2})^2$
$(-2)^2$	$(3)^2$
<u>4</u>	<u>9</u>

c) X-INT

$$\begin{aligned} (x-2)^2 + (y+3)^2 &= 4 \\ (x-2)^2 + (0+3)^2 &= 4 \\ (x-2)^2 + 9 &= 4 \\ (x-2)^2 &= 4-9 \\ (x-2)^2 &= -5 \\ x-2 &= \pm\sqrt{-5} \\ x &= 2 \pm i\sqrt{5} \\ \text{NO X-INT} \end{aligned}$$

Y-INT

$$\begin{aligned} (x-2)^2 + (y+3)^2 &= 4 \\ (0-2)^2 + (y+3)^2 &= 4 \\ 4 + (y+3)^2 &= 4 \\ (y+3)^2 &= 4-4 \\ (y+3)^2 &= 0 \\ y+3 &= \pm\sqrt{0} \\ y &= -3 \end{aligned}$$

Y-INT: $(0, -3)$