

Name: _____ Date: _____ Period: _____

Putting General Form in "Order"

EX1: $109 - 10y + x^2 = -20x - y^2$

$$x^2 + 20x + y^2 - 10y = -109$$

EX2: $y^2 - 12x + x^2 = 30y - 257$

$$x^2 - 12x + y^2 - 30y = -257$$

EX3: $x^2 = -y^2 + 4y + 140$

$$x^2 + y^2 - 4y = 140$$

STEPS

1. Write the equation in order
2. Divide the x coefficient by 2
3. Square that number & add to the end
4. Divide the y coefficient by 2
5. Square that number & add to the end
6. Take the square root of that sum as the radius
7. Take the opp. of step 2 and step 4 as the center (h, k)

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

Identify the center and the radius

EX1: $190 + 26x - x^2 - 10y - y^2$

$$x^2 + 26x + y^2 + 10y = -190$$

$$\frac{26}{2} = 13 = 13^2 = +169$$

$$\frac{10}{2} = 5 = 5^2 = +25$$

center $(-13, -5)$

$$\sqrt{4} = \sqrt{r^2}$$

2 = radius

$$(x - (-13))^2 + (y - (-5))^2 = 2^2$$

$$(x + 13)^2 + (y + 5)^2 = 4$$

EX2: $x^2 - 8y - 13 - 2x - y^2$

$$x^2 + 2x + y^2 - 8y = -13$$

$$\frac{2}{2} = 1 = 1^2 = +1$$

$$\frac{-8}{2} = -4 = (-4)^2 = +16$$

center $(-1, 4)$ 2 = radius

$$(x - (-1))^2 + (y - 4)^2 = 2^2$$

$$(x + 1)^2 + (y - 4)^2 = 4$$

EX3: $4y - 6x - 36 + y^2 = -x^2$

$$x^2 - 6x + y^2 + 4y = 36$$

$$\frac{-6}{2} = -3 = (-3)^2 = +9$$

$$\frac{4}{2} = 2 = (2)^2 = +4$$

center $(3, -2)$

$$\sqrt{49} = \sqrt{r^2}$$

7 = radius

$$(x - 3)^2 + (y + 2)^2 = 49$$