

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

Use the information provided to write the equation of each circle.

- 1) Center: $(-11, 3)$

Radius: 5

$$(x - (-11))^2 + (y - 3)^2 = 5^2$$

$$(x + 11)^2 + (y - 3)^2 = 25$$

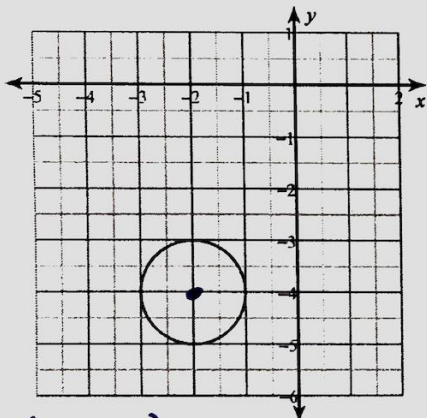
- 2) Center: $(9, -14)$

Radius: $\sqrt{21}$

$$(x - 9)^2 + (y - (-14))^2 = (\sqrt{21})^2$$

$$(x - 9)^2 + (y + 14)^2 = 21$$

3)

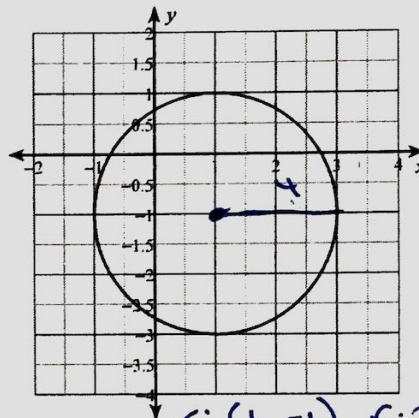


$C: (-2, -4) \quad r = 1$

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

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

4)



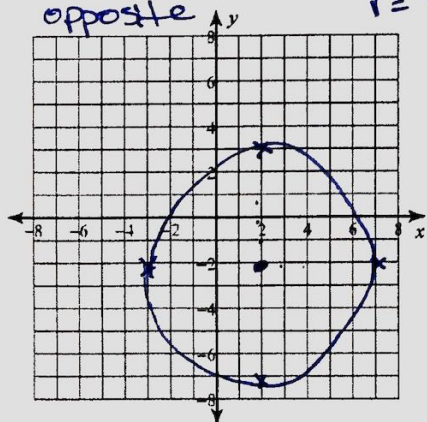
$C: (1, -1) \quad r: 2$

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

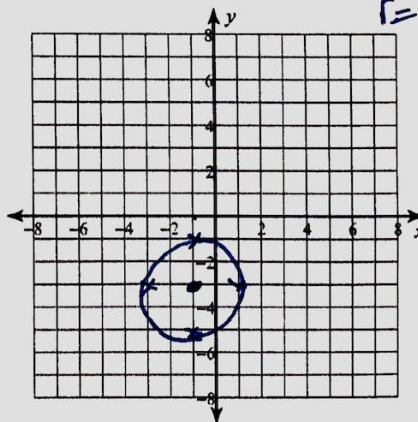
$$(x - 1)^2 + (y + 1)^2 = 4$$

Identify the center and radius of each. Then sketch the graph.

- 5) $(x - 2)^2 + (y + 2)^2 = 25$ $C: (2, -2)$
 opposite $r = 5$



- 6) $(x + 1)^2 + (y + 3)^2 = 4$ $C: (-1, -3)$
 $r = 2$



Equation of a Circle: $(x-h)^2 + (y-k)^2 = r^2$

DISTANCE FORMULA: $d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$

MIDPOINT FORMULA: $M = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$

7. Using the distance formula, write the equation of a circle whose center is $(3, -7)$ and goes through $(10, -4)$.

① Use distance formula to find radius $(3, -7)$ $(10, -4)$

$$\sqrt{(10-3)^2 + (-4-(-7))^2} = \sqrt{49+9} = \sqrt{58}$$

② Plug h, k, r into formula

$$(x-3)^2 + (y-(-7))^2 = \sqrt{58}^2$$

$$(x-3)^2 + (y+7)^2 = 58$$

8. Give the equation whose endpoints of the diameter are $(-2, 5)$ and $(8, -3)$.

① Use midpoint formula to find center $m = \left(\frac{-2+8}{2}, \frac{5+(-3)}{2} \right) = (3, 1)$

② Use distance formula to find radius $(3, 1)$ $(-2, 5)$

$$\sqrt{(-2-3)^2 + (5-1)^2} = \sqrt{25+16} = \sqrt{41}$$

③ Plug h, k, r in formula $(x-3)^2 + (y-1)^2 = \sqrt{41}^2$ $(x-3)^2 + (y-1)^2 = 41$

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

GENERAL FORM: $ax^2 + by^2 + cx + dy + e = 0$

9. Convert the following equation to general form: $(x-1)^2 + (y+2)^2 = 9$

$$(x-1)(x-1) + (y+2)(y+2) = 9$$

$$x^2 - 1x - 1x + 1 + y^2 + 2y + 2y + 4 - 9 = 0$$

$$x^2 - 2x + y^2 + 4y - 4 = 0$$

$$x^2 + y^2 - 2x + 4y - 4 = 0$$

10. Convert the following equation to standard form: $x^2 + y^2 + 24x + 2y + 129 = 0$

$$\left(\frac{24}{2}\right)^2 = 144$$

$$x^2 + 24x + 144 + y^2 + 2y + 1 = -129 + 144 + 1$$

$$\left(\frac{2}{2}\right)^2 = 1$$

$$(x+12)^2 + (y+1)^2 = 16$$