

6.10 Writing Equations of Circles HW

Directions: Write the equation of the circle in STANDARD form.

1) $x^2 + 2x + y^2 - 10y + 10 = 0$

$$x^2 + 2x + \underline{1} + y^2 - 10y + \underline{25} = -10 + \underline{1} + \underline{25}$$

$$\begin{matrix} (1)^2 \\ (-5)^2 \end{matrix} \quad \boxed{(x+1)^2 + (y-5)^2 = 16}$$

2) $x^2 + y^2 - 4x + 6y + 9 = 0$

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

$$\begin{matrix} (-2)^2 \\ (3)^2 \end{matrix} \quad \boxed{(x-2)^2 + (y+3)^2 = 4}$$

3) $x^2 + y^2 - 10x - 12y + 40 = 0$

$$x^2 - 10x + \underline{25} + y^2 - 12y + \underline{36} = -40 + \underline{25} + \underline{36}$$

$$\begin{matrix} (-5)^2 \\ (-6)^2 \end{matrix} \quad \boxed{(x-5)^2 + (y-6)^2 = 21}$$

4) $\frac{2x^2}{2} + \frac{2y^2}{2} - \frac{8x}{2} + \frac{4y}{2} = -2$

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

$$x^2 - 4x + \underline{4} + y^2 + 2y + \underline{1} = -1 + \underline{4} + \underline{1}$$

$$\begin{matrix} (-2)^2 \\ (1)^2 \end{matrix} \quad \boxed{(x-2)^2 + (y+1)^2 = 4}$$

5) $\frac{7x^2}{7} + \frac{7y^2}{7} - \frac{28x}{7} + \frac{14}{7} = 0$

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

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

$$(-2)^2 \quad \boxed{x^2 + (y-2)^2 = 2}$$

6) $\frac{3x^2}{3} + \frac{3y^2}{3} + \frac{18x}{3} + \frac{6y}{3} = 0$

$$x^2 + y^2 + 6x + 2y = 0$$

$$x^2 + 6x + \underline{9} + y^2 + 2y + \underline{1} = 0 + \underline{9} + \underline{1}$$

$$\begin{matrix} (3)^2 \\ (1)^2 \end{matrix} \quad \boxed{(x+3)^2 + (y+1)^2 = 10}$$

Directions: Write the equation of the circle in GENERAL form.

7) $(x-2)^2 + (y+6)^2 = 25$

$$(x-2)(x-2) + (y+6)(y+6) = 25$$

$$x^2 - 4x + 4 + y^2 + 12y + 36 = 25$$

$$x^2 + y^2 - 4x + 12y + 15 = 0$$

8) $(x+5)^2 + y^2 = 27$

$$(x+5)(x+5) + y^2 = 27$$

$$x^2 + 10x + 25 + y^2 = 27$$

$$x^2 + y^2 + 10x - 2 = 0$$

Directions: Write the equation of the circle in both forms.

9) Center: $(2, -3)$ & Radius: 7

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

general: $(x-2)(x-2) + (y+3)(y+3) = 49$

$$x^2 - 4x + 4 + y^2 + 6y + 9 = 49$$

$$x^2 + y^2 - 4x + 6y - 36 = 0$$

10) Center: $(-13, -16)$ & Point on the Circle: $(-10, -16)$

$d=r=3$

Standard: $(x+13)^2 + (y+16)^2 = 9$

general: $(x+13)(x+13) + (y+16)(y+16) = 9$

$$x^2 + 26x + 169 + y^2 + 32y + 256 = 9$$

$$x^2 + y^2 + 26x + 32y + 416 = 0$$

* 11) Ends of the diameter are $(18, -13)$ and $(4, -3)$

midpoint = $(11, -8)$ $r = \sqrt{74}$

Standard: $(x-11)^2 + (y+8)^2 = 74$

general: $(x-11)(x-11) + (y+8)(y+8) = 74$

$$x^2 - 22x + 121 + y^2 + 16y + 64 = 74$$

$$x^2 + y^2 - 22x + 16y + 111 = 0$$

12) Center $(0, 13)$ & Area of 25π $r=5$

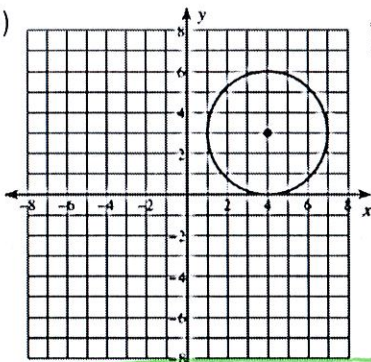
Standard: $x^2 + (y-13)^2 = 25$

general: $x^2 + (y-13)(y-13) = 25$

$$x^2 + y^2 - 26y + 169 = 25$$

$$x^2 + y^2 - 26y + 144 = 0$$

13)



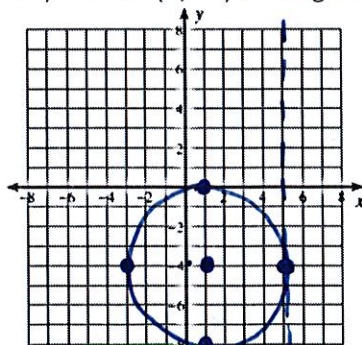
Standard: $(x-4)^2 + (y-3)^2 = 9$

general: $(x-4)(x-4) + (y-3)(y-3) = 9$

$$x^2 - 8x + 16 + y^2 - 6y + 9 = 9$$

$$x^2 + y^2 - 8x - 6y + 16 = 0$$

14) Center $(1, -4)$ & Tangent to $x=5$



Standard: $(x-1)^2 + (y+4)^2 = 16$

general: $(x-1)(x-1) + (y+4)(y+4) = 16$

$$x^2 - 2x + 1 + y^2 + 8y + 16 = 16$$

$$x^2 + y^2 - 2x + 8y + 1 = 0$$