Answers!

DIRECTIONS: For #1-3, find the **distance** between the points and the **midpoint** for the segment defined by the points.

1. $(3, 0)$, $(8, -5)$ Distance $\mathbf{5\sqrt{2}}$ Midpoint $\mathbf{(5.5, -2.5)}$

2. $(-5, 2)$, $(-3, 9)$ Distance $\mathbf{\sqrt{53}}$ Midpoint $\mathbf{(-4,\ 5.5)}$

3. $(3 + \sqrt{2}, 6 + \sqrt{5})$, $(-3 + \sqrt{2}, 6 - \sqrt{5})$ Distance $\mathbf{2\sqrt{14}}$ Midpoint $\mathbf{(\sqrt{2},\ 6)}$

DIRECTIONS: For #4, find the coordinates of Q given that M is the midpoint of $\overline{PQ}$.

4. $P\ (2, -1)$, $M\ (5, 3)$ $\boldsymbol{Q\ (8, 7)}$

DIRECTIONS: For #5-6, write an equation of the circle with the given center and radius.

5. Center: $(4, 2)$; radius $=\ 6$ $\boldsymbol{(x-4)^2 + (y-2)^2 = 36}$

6. Center: $(-1, -3)$; radius $= 3\sqrt{3}$ $\boldsymbol{(x+1)^2 + (y+3)^2 = 27}$

DIRECTIONS: For #7-9, write the following equations in the standard form of a circle, then find the center and radius.

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

$(x-4)^2 + (y+3)^2 = 9$
Center: $(4, -3)$ **Radius: 3**

8. $x^2 + 10x + y^2 = 0$

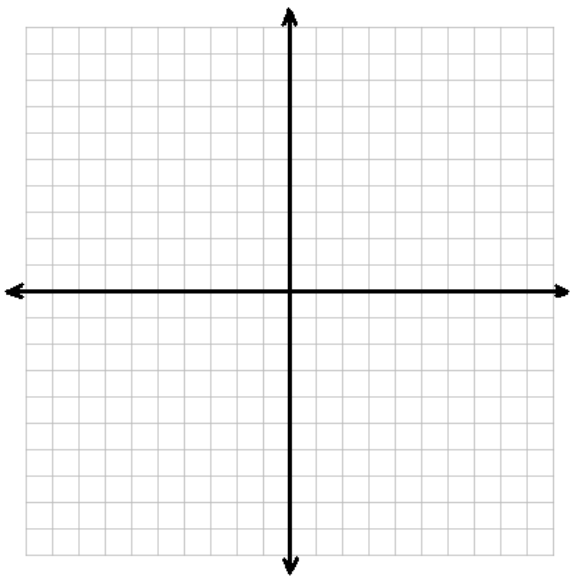
$(x+5)^2 + y^2 = 25$
Center: $(-5, 0)$ **Radius: 5**

9. $4x^2 + 4y^2 - 2x - 24y = 0$

$\left(x - \frac{1}{4}\right)^2 + (y-3)^2 = \frac{145}{16}$
Center: $(\frac{1}{4}, 3)$ **Radius:** $\frac{\sqrt{145}}{4}$

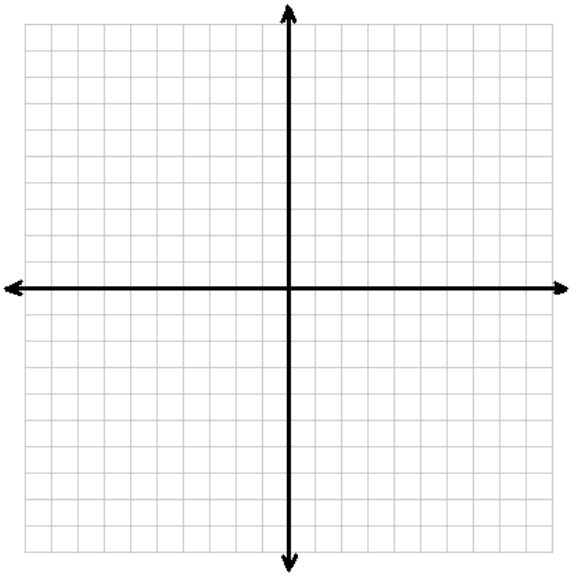
DIRECTIONS: For #10, sketch a circle on the graph described by the given equation.

10. $(x+2)^2 + (y-2)^2 = 16$



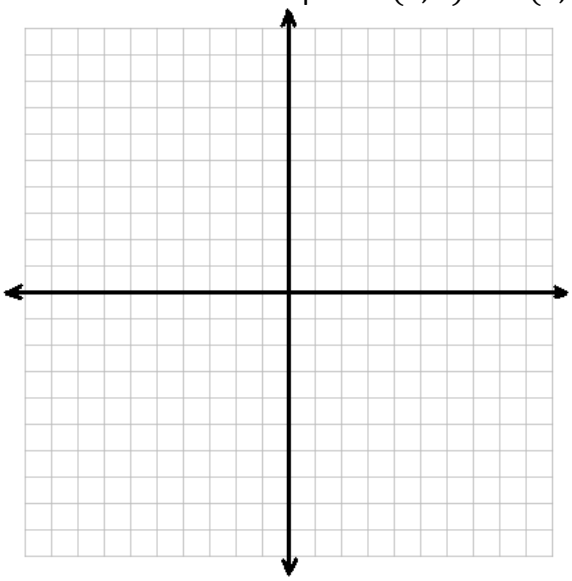
DIRECTIONS: For #11-12, write an equation in the standard form of a circle described by the given information. Graphs are provided for your convenience- you are not required to use them.

11. Center in Quadrant II; radius of 5; circle is tangent to the y-axis at $(0, 3)$



$$(x + 5)^2 + (y - 3)^2 = 25$$

12. A diameter has endpoints $(1, 4)$ and $(9, 2)$



$$(x - 5)^2 + (y - 3)^2 = 17$$