

Name _____

Date _____ Period _____

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

Identify the center and radius of each.

1) $(x - \frac{13}{2})^2 + (y - \sqrt{217})^2 = 13$

C $(\frac{13}{2}, \sqrt{217})$
 r $\sqrt{13}$

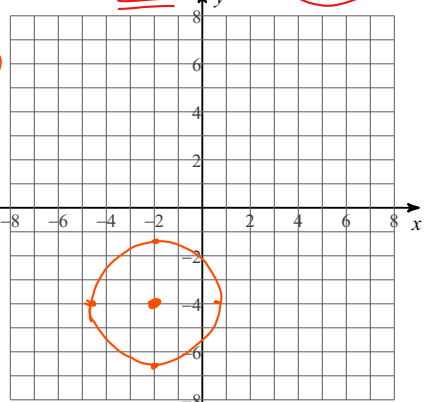
2) $(x + 6)^2 + (y - 12)^2 = 49$

C $(-6, 12)$
 r 7

Identify the center and the radius. Then graph the circle.

3) $4x^2 + 32y + 52 = -4y^2 - 16x$

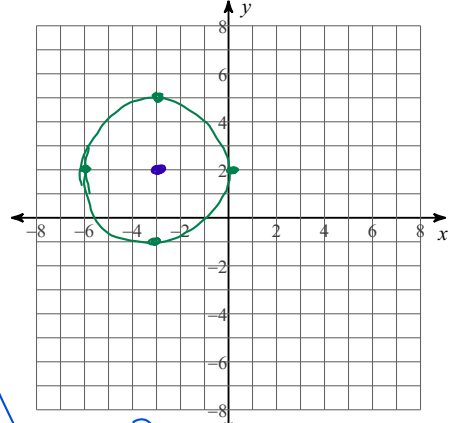
C $(-2, -4)$
 r $\sqrt{7}$
 ≈ 2.6



$4x^2 + 16x + 16 + 4y^2 + 32y + 64 = -52 + 16 + 64$
 $4(x^2 + 4x + 4) + 4(y^2 + 8y + 16) = 28$
 $\frac{4}{4}(x+2)^2 + \frac{4}{4}(y+4)^2 = \frac{28}{4}$
 $(x+2)^2 + (y+4)^2 = 7$

4) $-2y^2 - 12x = 2x^2 - 8y + 8$

C $(-3, 2)$
 r 3



$2x^2 + 12x + 18 + 2y^2 - 8y + 8 = -8 + 18 + 8$
 $2(x^2 + 6x + 9) + 2(y^2 - 4y + 4) = 18$
 $\frac{2}{2}(x+3)^2 + \frac{2}{2}(y-2)^2 = \frac{18}{2}$
 $(x+3)^2 + (y-2)^2 = 9$

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

5) Center: $(-9, -\frac{11}{2})$

$\frac{10\pi}{2\pi} = \frac{2\pi r}{2\pi} \rightarrow r=5$

Circumference: 10π

$$(x+9)^2 + (y+\frac{11}{2})^2 = 25$$

6) Center: $(8, 15)$

Point on Circle: $(7, 13)$

$$(x-8)^2 + (y-15)^2 = r^2$$

$$(7-8)^2 + (13-15)^2 = r^2$$

$$(-1)^2 + (-2)^2 = r^2$$

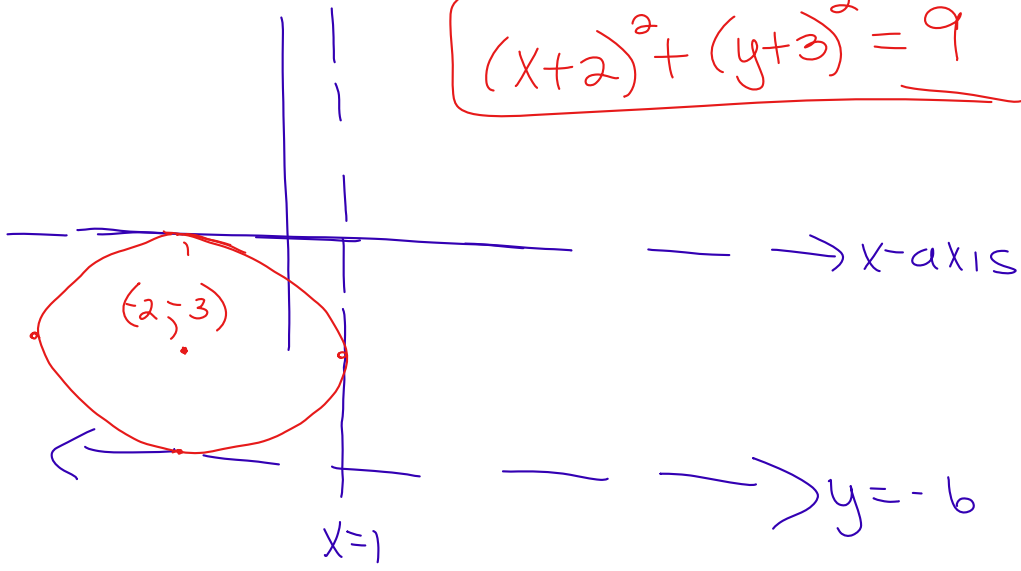
$$1+4 = r^2 = 5$$

$$(x-8)^2 + (y-15)^2 = 5$$

7) Center lies in the third quadrant

Tangent to the x-axis, $x=1$, and $y=-6$
vertical Horizontal

$$(x+2)^2 + (y+3)^2 = 9$$



8) Three points on the circle:
 (16, 1), (8, -9), and (-2, -1)

$$(-2-h)^2 + (-1-k)^2 = r^2$$

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

$$(16-h)^2 + (1-k)^2 = r^2 \rightarrow \begin{matrix} (16-7)^2 + (1-0)^2 \\ = 9^2 + 1^2 = r^2 \\ = 82 \end{matrix}$$

$$(8-h)^2 + (-9-k)^2 = r^2$$

$$(16-h)^2 + (1-k)^2 = (8-h)^2 + (-9-k)^2$$

$$4 + 4h + h^2 + 1 + 2k + k^2 = 64 - 16h + h^2 + 81 + 18k + k^2$$

$$\begin{matrix} 5 + 4h + 2k = 145 - 16h + 18k \\ -5 + 16h - 18k \quad -5 + 16h - 18k \end{matrix}$$

$$(20h - 16k = 140) - 4$$

$$\boxed{5h - 4k = 35}$$

$$256 - 32h + h^2 + 1 - 2k + k^2 = 64 - 16h + h^2 + 81 + 18k + k^2$$

$$\begin{matrix} 257 - 32h - 2k = 145 - 16h + 18k \\ -145 + 32h + 2k \quad -145 + 32h + 2k \end{matrix}$$

$$(112 = 16h + 20k) - 4 \rightarrow \boxed{28 = 4h + 5k}$$

$$\begin{matrix} 5(5h - 4k = 35) \rightarrow 25h - 20k = 175 \\ 4(4h + 5k = 28) \rightarrow 16h + 20k = 112 \end{matrix}$$

$$28 = 4(7) + 5k$$

$$\boxed{k = 0}$$

$$\begin{array}{r} 4h = 287 \\ \hline 4 \quad 4 \end{array}$$

$$\boxed{h = 7}$$

$$\boxed{(x-7)^2 + y^2 = 82}$$

Circles Notes

Identify the center and radius of each.

$$1) \left(x - \frac{13}{2}\right)^2 + (y - \sqrt{217})^2 = 13$$

$$\text{Center: } \left(\frac{13}{2}, \sqrt{217}\right)$$

$$\text{Radius: } \sqrt{13}$$

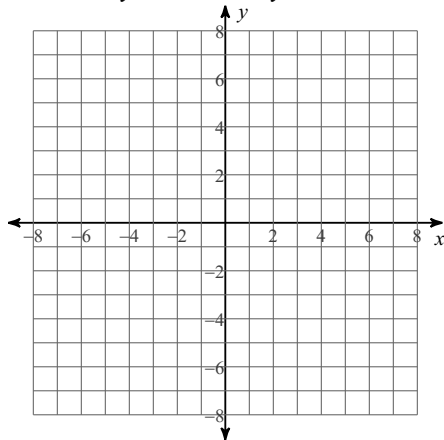
$$2) (x + 6)^2 + (y - 12)^2 = 49$$

$$\text{Center: } (-6, 12)$$

$$\text{Radius: } 7$$

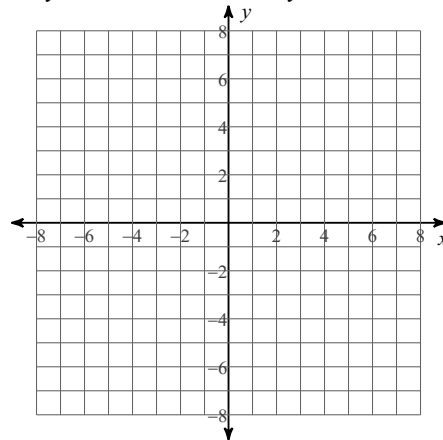
Identify the center and the radius. Then graph the circle.

$$3) 4x^2 + 32y + 52 = -4y^2 - 16x$$



$$\text{Center: } (-2, -4) \text{ radius } \sqrt{7}$$

$$4) -2y^2 - 12x = 2x^2 - 8y + 8$$



$$\text{Center: } (-3, 2) \text{ radius } 3$$

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

5) Center: $\left(-9, -\frac{11}{2}\right)$
Circumference: 10π

$$(x + 9)^2 + \left(y + \frac{11}{2}\right)^2 = 25$$

6) Center: $(8, 15)$
Point on Circle: $(7, 13)$

$$(x - 8)^2 + (y - 15)^2 = 5$$

7) Center lies in the third quadrant
Tangent to the x -axis, $x = 1$, and $y = -6$

$$(x + 2)^2 + (y + 3)^2 = 9$$

8) Three points on the circle:
(16, 1), (8, -9), and (-2, -1)

$$(x - 7)^2 + y^2 = 82$$