

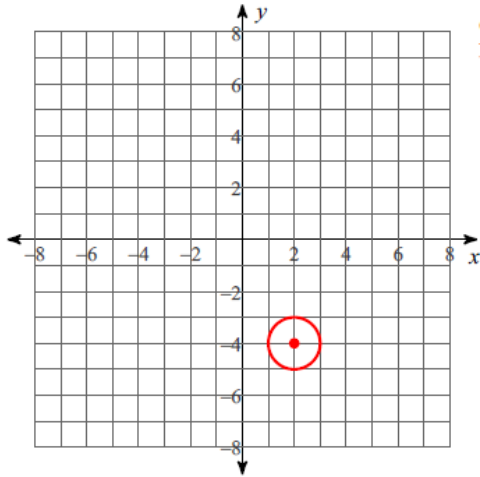
SM2 4.4: Graphing Circles

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

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

Center: $(2, -4)$

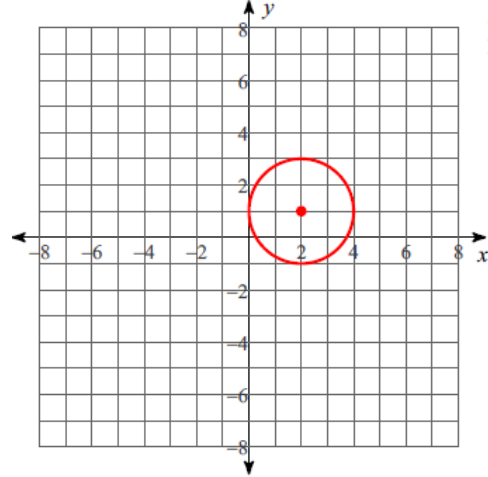
Radius: 1



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

Center: $(2, 1)$

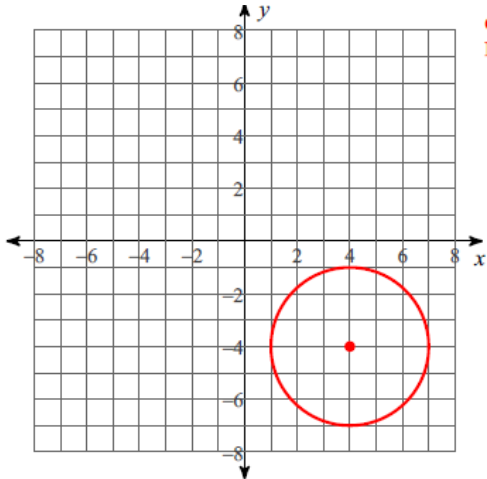
Radius: 2



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

Center: $(4, -4)$

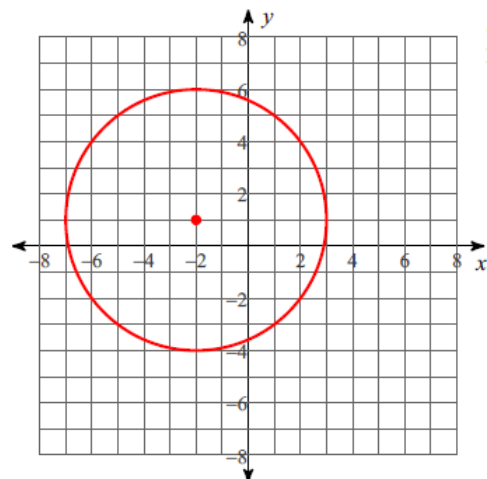
Radius: 3



4) $(x + 2)^2 + (y - 1)^2 = 25$

Center: $(-2, 1)$

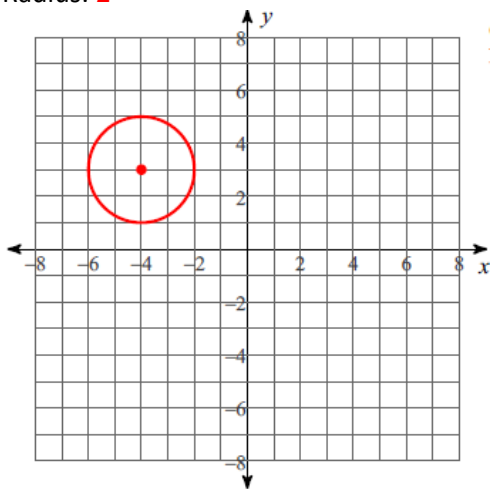
Radius: 5



5) $(x + 4)^2 + (y - 3)^2 = 4$

Center: $(-4, 3)$

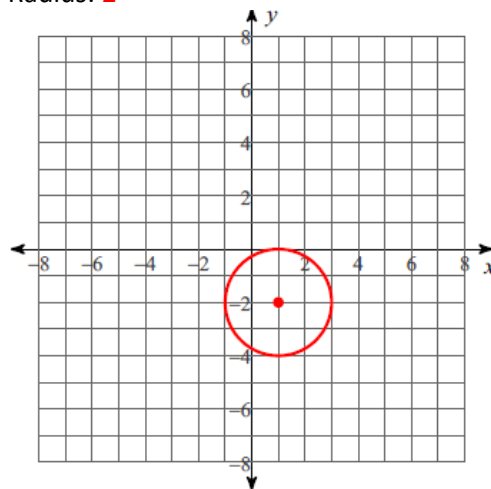
Radius: 2



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

Center: $(1, -2)$

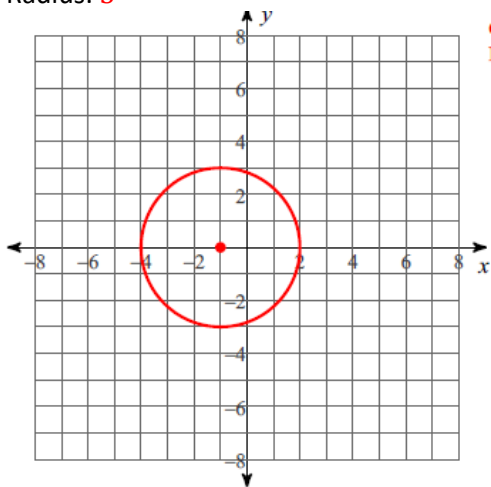
Radius: 2



7) $(x + 1)^2 + y^2 = 9$

Center: $(-1, 0)$

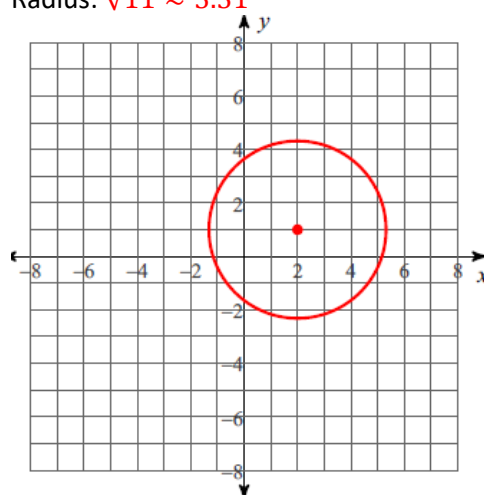
Radius: 3



8) $(x - 2)^2 + (y - 1)^2 = 11$

Center: $(2, 1)$

Radius: $\sqrt{11} \approx 3.31$



Identify the center and radius of each.

9) $(x - 15)^2 + (y + 1)^2 = 49$

Center: $(15, -1)$

Radius: 7

10) $x^2 + (y - 14)^2 = 81$

Center: $(0, 14)$

Radius: 9

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

- 11) Center: $(6, 4)$
Radius: 2

$$(x - 6)^2 + (y - 4)^2 = 4$$

- 12) Center: $(-15, -11)$
Radius: $\sqrt{15}$

$$(x + 15)^2 + (y + 11)^2 = 15$$

13) A particular cell phone tower is designed to service a 12-mile radius. The tower is located at $(-3, 5)$ on a coordinate plane whose units represent miles.

- a) What is the standard equation of the outer boundary of the region serviced by the tower?

$$(x + 3)^2 + (y - 5)^2 = 144$$

- b) Is a cell phone user at $(8, 0)$ within the service range? Explain.

$(8 + 3)^2 + (0 - 5)^2 = 11^2 + (-5)^2 = 146$ which is bigger than 144 so the user is not within the service range of this tower.

14) A pizza restaurant will deliver up to 5 miles. The restaurant is located at the origin on a coordinate plane whose units represent miles.

- a) What is the standard equation of the outer boundary of the delivery region?

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

- b) Customers are located at $A(4, 3)$, $B(5, 0)$, and $C(2, \sqrt{21})$. Which of these customers, if any, are on the outer boundary of the delivery region? Explain.

A is on the outer boundary since $4^2 + 3^2 = 25$

B is on the outer boundary since $5^2 + 0^2 = 25$

C is on the outer boundary since $2^2 + \sqrt{21}^2 = 25$