8.11

Name (print first and last) _____ **Per**_____ **Date:** 4/8 due 4/9

8.11 Equation of a circle **Geometry Regents 2013-2014 Ms. Lomac**

SLO: I can write equations from graphs of circles.

(1) ☐ On a graph, circles are defined by their **radius** and **center**. To write an equation for a circle, we need to find a relationship between the center, the radius, and the x and y coordinates. Let's start by looking at a circle with a radius of 5 and center at the origin (0,0). Below, the same circle is graphed 12 times, each time with a different point highlighted. Use the graphs and the guidance below to find an equation for the circle.

☐ Highlight the shape formed in the first circle by the *x* value, the *y* value, and the **radius** of the circle.

☐ The shape you highlighted is a _____ _____.

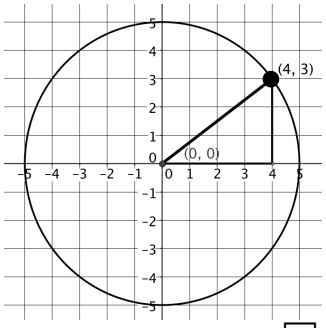
☐ The radius of the circle is also the _____ of the _____ _____.

☐ The *x* value for the point on the circle is also the length of a _____of the _____ _____.

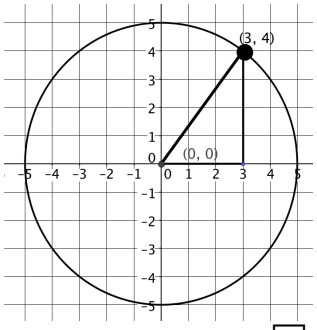
☐ The *y* value for the point on the circle is also the length of a _____of the _____ _____.

☐ The equation for relating lengths of a _____ _____ is _____.

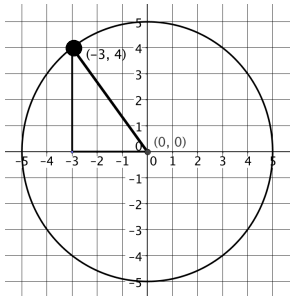
☐ For each circle below, write an equation by plugging in the *x*, *y*, and *r* values and verify that the equation works by calculating and checking. If the equation works for graph, check the box.



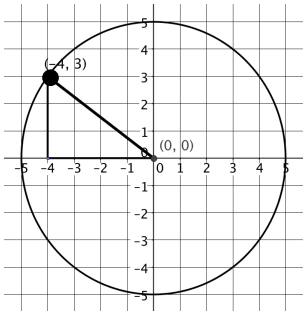
_____ _____ _____ ☐



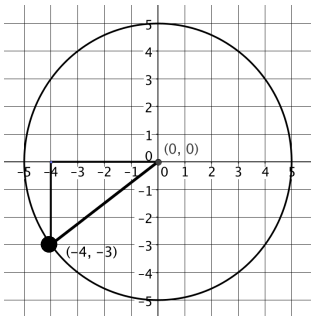
_____ _____ _____ ☐



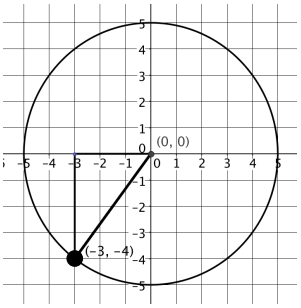
_____ _____ _____ ☐



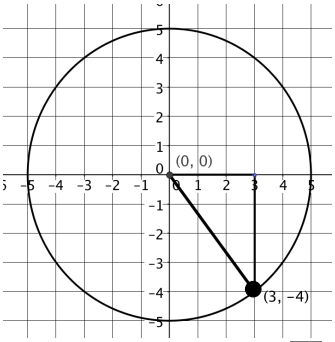
_____ _____ _____ ☐



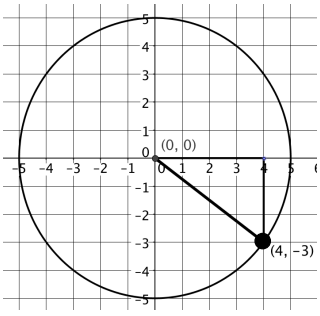
_____ _____ _____ ☐



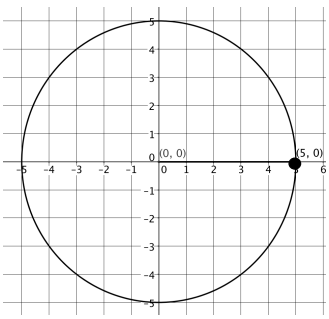
_____ _____ _____ ☐



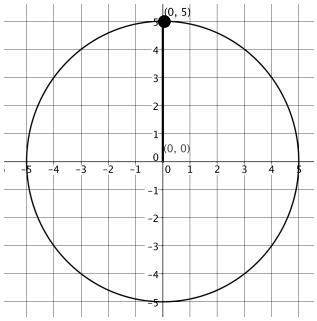
_____ _____ _____ ☐



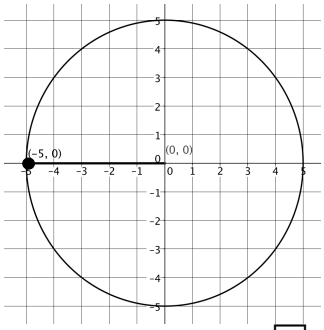
_____ _____ _____ ☐



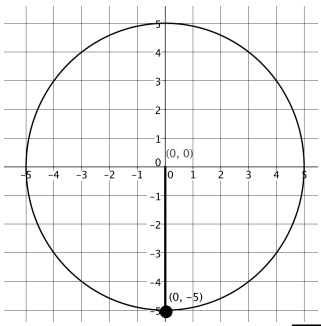
_____ _____ _____ ☐



_____ _____ _____ ☐



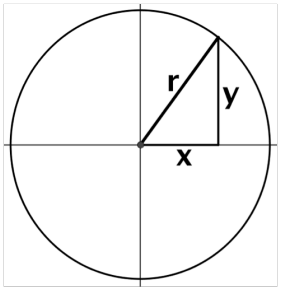
_____ _____ _____ ☐



_____ _____ _____ ☐

8.11

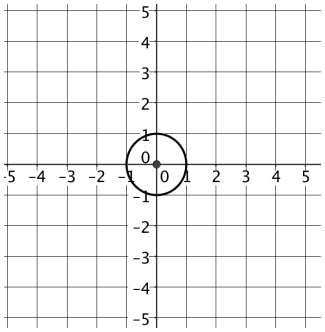
(2) ☐ Did the equation work for all 12 points of the circle? _____ Will it work for *every* point on the circle? _____
☐ Use the diagram at right to write a general equation for circles centered at the origin:



_____

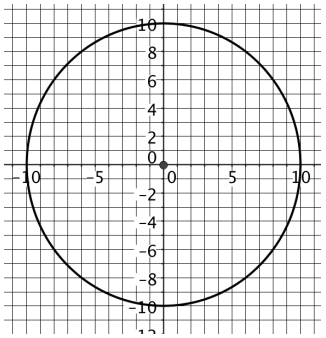
(3) ☐ Write an equation with the variables *x* and *y* for each circle. The center of each circle Is the origin..

☐ (a)



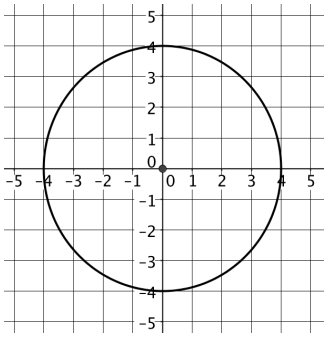
_____

☐ (b)



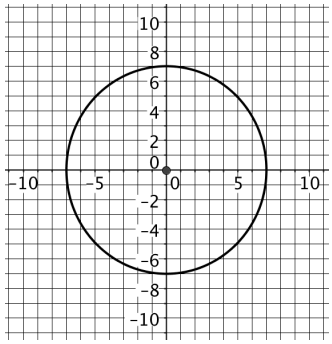
_____

☐ (c)



_____

☐ (d)



_____

☐ (e) radius = 20

_____

☐ (f) radius = 11

_____

☐ (g) radius = 3

_____

☐ (h) radius = 9

_____

(You may want to sketch *i* and *j* to see the circle first.)

☐ (i) (0,2) is a point on the circle

_____

☐ (j) (-8, 0) is a point on the circle

_____

8.11

(4) ☐ What if the center is NOT at the origin? We could write the equation for the circle if the center coordinates were (0,0). So, how can we "drag" or **translate** the center of the circle back to the origin?

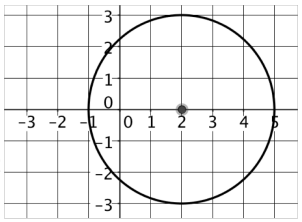
☐ (a)

The coordinates for the circle center are: (_____, _____)

"Drag" or translate x & y so the center is back at the origin (_____, _____)

What will our equation look like? ( )^2 + ( )^2 = ( )^2

Simplify the equation _____



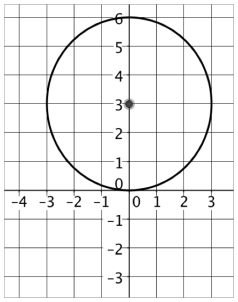
☐ (b)

The coordinates for the circle center are: (_____, _____)

"Drag" or translate x & y so the center is back at the origin (_____, _____)

What will our equation look like? ( )^2 + ( )^2 = ( )^2

Simplify the equation _____



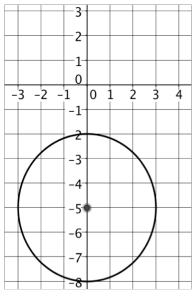
☐ (c)

The coordinates for the circle center are: (_____, _____)

"Drag" or translate x & y so the center is back at the origin (_____, _____)

What will our equation look like? ( )^2 + ( )^2 = ( )^2

Simplify the equation _____



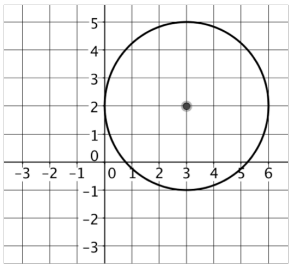
☐ (d)

The coordinates for the circle center are: (_____, _____)

"Drag" or translate x & y so the center is back at the origin (_____, _____)

What will our equation look like? ( )^2 + ( )^2 = ( )^2

Simplify the equation _____



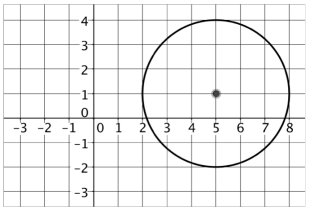
☐ (e)

The coordinates for the circle center are: (_____, _____)

"Drag" or translate x & y so the center is back at the origin (_____, _____)

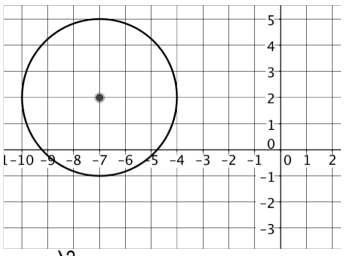
What will our equation look like? ( )^2 + ( )^2 = ( )^2

Simplify the equation _____



8.11

☐ (f)



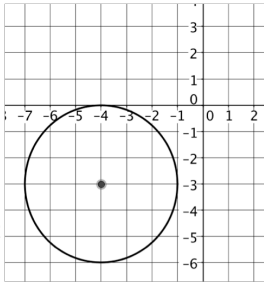
The coordinates for the circle center are: (_____, _____)

"Drag" or translate x & y so the center is back at the origin (_____, _____)

What will our equation look like? ( )^2 + ( )^2 = ( )^2

Simplify the equation _____

☐ (g)



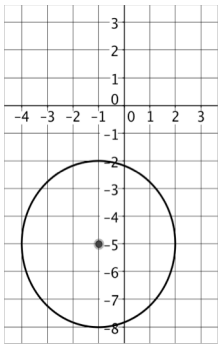
The coordinates for the circle center are: (_____, _____)

"Drag" or translate x & y so the center is back at the origin (_____, _____)

What will our equation look like? ( )^2 + ( )^2 = ( )^2

Simplify the equation _____

☐ (h)



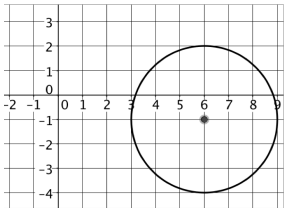
The coordinates for the circle center are: (_____, _____)

"Drag" or translate x & y so the center is back at the origin (_____, _____)

What will our equation look like? ( )^2 + ( )^2 = ( )^2

Simplify the equation _____

☐ (i)



The coordinates for the circle center are: (_____, _____)

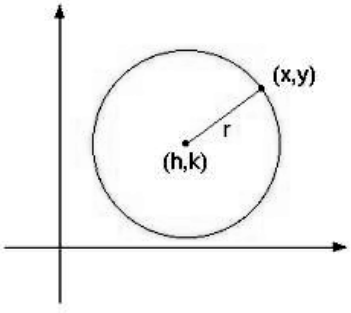
"Drag" or translate x & y so the center is back at the origin (_____, _____)

What will our equation look like? ( )^2 + ( )^2 = ( )^2

Simplify the equation _____

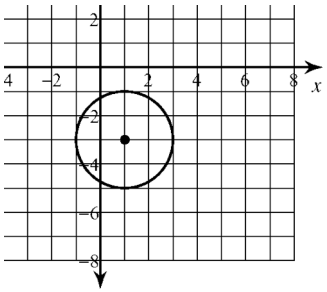
☐ (5) SUMMARIZE: For any circle with center *(h*, *k*) and radius *r*, the equation of the circle can be written:

_____



8.11 Exit Ticket Name_____Per_____

(1) Write an equation for the circle

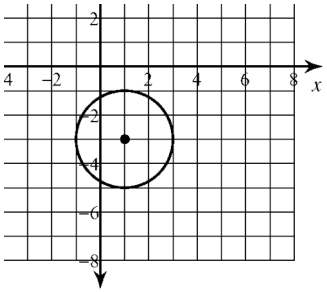


(2) Desribe how circles and right triangles are related. Include a labeled sketch.

- ☐ I got this!
- ☐ I can with a bit of help
- ☐ I will, given lots of help
- ☐ I can't
- ☐ I won't bother to
- ☐ I refuse to

8.11 Exit Ticket Name_____Per_____

(1) Write an equation for the circle

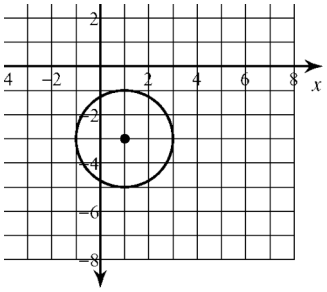


(2) Desribe how circles and right triangles are related. Include a labeled sketch.

- ☐ I got this!
- ☐ I can with a bit of help
- ☐ I will, given lots of help
- ☐ I can't
- ☐ I won't bother to
- ☐ I refuse to

8.11 Exit Ticket Name_____Per_____

(1) Write an equation for the circle

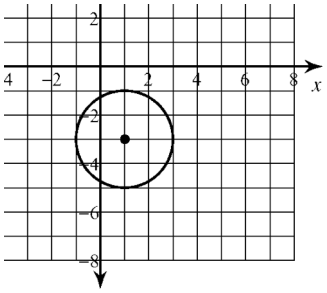


(2) Desribe how circles and right triangles are related. Include a labeled sketch.

- ☐ I got this!
- ☐ I can with a bit of help
- ☐ I will, given lots of help
- ☐ I can't
- ☐ I won't bother to
- ☐ I refuse to

8.11 Exit Ticket Name_____Per_____

(1) Write an equation for the circle



(2) Desribe how circles and right triangles are related. Include a labeled sketch.

- ☐ I got this!
- ☐ I can with a bit of help
- ☐ I will, given lots of help
- ☐ I can't
- ☐ I won't bother to
- ☐ I refuse to