Lesson 8.11- SWBAT write equations of a circle and graph.

Kick off-

1) Complete the square: $x^2 - 4x - 10 = 0$

$+10 \quad +10$

$x^2 - 4x = 10$

$\sqrt{(x-2)^2} = \sqrt{10+4}$

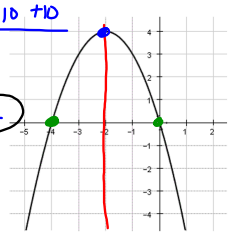
$\sqrt{14}$

$x - 2 = \pm\sqrt{14}$

$+2 \quad +2$

$x = 2 \pm \sqrt{14}$

2) Using the graph below, determine the following:



A) The axis of symmetry

$x = -2$

B) State the maximum point

$(-2, 4)$

C) The roots of the equation

$(-4, 0)$ $(0, 0)$

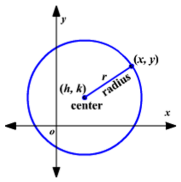
3) Write the equation of a circle given the center $(-5, 8)$ and the radius of 4.

$(x+5)^2 + (y-8)^2 = 4^2$

$(x+5)^2 + (y-8)^2 = 16$

$(5, -8)$

---




Circles

Standard Form of the Equation of a Circle:

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

$(x, y)$- point on the circle

$(h, k)$- center of the circle **MUST CHANGE SIGNS IN EQUATION.

$r$ – radius (the distance from the center to the edge)

Sketching a Circle:

1) Write the equation and identify the radius and center.
2) Plot the center of the circle
3) Count from the center of the circle the length of the radius (in all 4 directions)
4) Connect the (4) points to make a circle!!

---

1) State the center and radius of the circle $(x-3)^2 + (y+1)^2 = 4$

$r^2$

$C \rightarrow (3, -1)$ $\quad r = \sqrt{4} = 2$

2) If the center of a circle is $(-3, 4)$ and there is a point on the circle at $(-3, 8)$. Write the equation of the circle.

$(x+3)^2 + (y-4)^2 = 16$ ✓

$(-3+3)^2 + (8-4)^2 = 16$ ✓

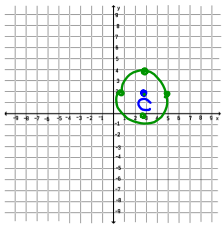
---

Directions: Write the equation of the circle and then graph them.

3) Graph the circle $(x-3)^2 + (y-2)^2 = 4$

Center $\rightarrow (3, 2)$ ← Plot

$r = \sqrt{4} = 2$ ← Count

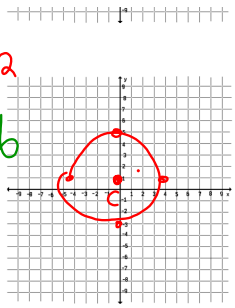


---

4) A circle whose radius is 4 and whose center is $(0, 1)$.

$(x-0)^2 + (y-1)^2 = 16$

$4^2$



---

5) A circle whose center is $(4, -3)$ and has a point $(-1, -3)$ on the circle.

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

$(x-4)^2 + (y+3)^2 = 5^2 = 25$