Name:_____ **Date:_____**

Geometry Notes CG - 6: Completing the Square

Ex: For the circle $(x-3)^2+(y+5)^2=16$, find

a. The coordinates of the center:

b. The length of the radius:

Ex: For the circle $x^2+y^2+8x-12y+3=0$, find

a. The coordinates of the center:

b. The length of the radius:

Ex: $x^2 + y^2 - 6y - 16 = 0$

Name:_____ **Date:**_____

Geometry HW: CG – 6

1. Find the coordinates of the center and the length of the radius of the circle $x^2 + 10x + y^2 - 8y + 5 = 0$.

2. Find the coordinates of the center and the length of the radius of the circle $x^2 + y^2 - 5y - 14 = 0$.

3. Explain why the equation $x^2 - 2x + y^2 + 6y + 14 = 0$ does *not* represent the equation of a circle.

4. Use completing the square to write the quadratic function $y = x^2 - 12x + 24$ in vertex form $y = (x - h)^2 + k$. Give the coordinates of the vertex. Is it a maximum or a minimum for the function? How do you know?

6. a. Graph ΔBUG having vertices $B(-4, 1)$, $U(8, 1)$ and $T(8, 10)$.

   b. The point $I(5, 4)$ is called the *incenter* of the circle (more on that later in the course). Show that I is equidistant from sides $\overline{BU}$ and $\overline{UG}$. Call that distance r. (I is also the same distance from the third side, $\overline{BG}$, but that is harder to figure out.)

   c. Write the equation of the circle having I as its center and radius r. Graph the circle. What is special about this circle?

7. a. What number is halfway between 4 and 10 on a number line?

b. What number is halfway between –2 and 8 on a number line?

c. What number is halfway between 125 and 453 on a number line?

d. What number is halfway between x_1 and x_2 on a number line?