UNIT 6 TEST

1. Jerry wants to build a circular swimming pool in his back yard. To find where the swimming pool should be centered, he walks 15 feet east and 8 feet north from the edge of his yard. Find a model for the boundary of the swimming pool so he can make sure his pool reaches the edge of his yard.

2. Write the following equation in vertex form. List the vertex and the radius: $x^{2}+y^{2}+6x-8y=0$

3. Consider the function $y+4=\frac{1}{20}\left(x-1\right)^{2}$

a. What shape does the function make?

b. What is the vertex of this shape?

c. How far is the focus from the vertex?

d. How far is the focus from the directrix?

e. Using the grid below, plot and label the vertex, the focus, and the directrix of the function. Then sketch the graph of the function.

 

4. Given that the focus of a parabola is at the point (6,2) and the directrix of the parabola is $y=-7$, write the equation of the parabola in vertex form.

5. Consider a circle centered at (1,4) and has a radius of 5 units. Does the point $(3,\sqrt{21})$ lie on the circle?

6. Given the quadratic equation $y=x^{2}+3x-4$ and the linear equation $y=2x+5$ answer the following:

 a) How many solutions are there for this system of equations?

 b) If there are one or more solutions, what are they?

7. A frog is sitting at the foot of a ramp. When a fly comes by, the frog leaps into the air and lands on a spot further up the ramp. If the frog’s path is given by $y=3x-0.5x^{2}$, where *x* is the horizontal distance from the foot of the ramp in feet and *y* is the corresponding vertical distance from the ground in feet, and the ramp has a slope of 0.6, how high above the ground is the frog in his new spot?