Math 25 - Fall 2016
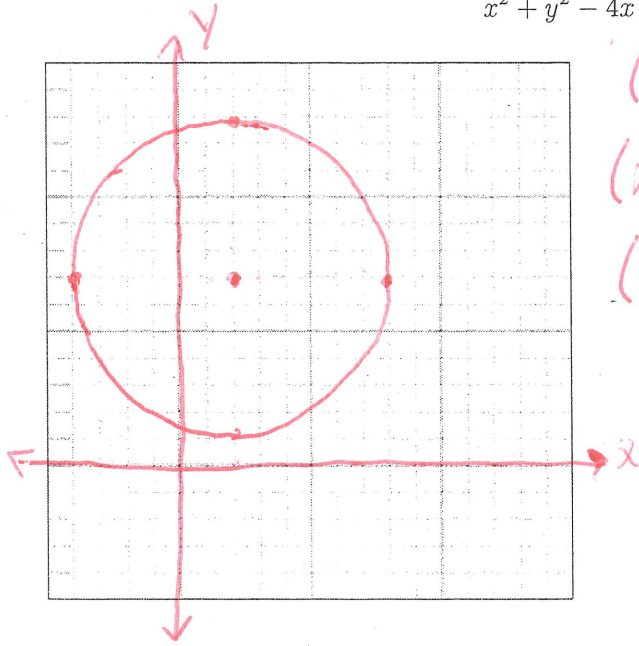
Quiz 6: Wednesday September 21, 2016

1. (3 points) Determine what kind of graph is represented by the following equation. Graph the equation.

$$x^2 + y^2 - 4x - 14y + 17 = 0$$

$(x^2 - 4x) + (y^2 - 14y) = -17$

$(x^2 - 4x + 4) + (y^2 - 14y + 49) = -17 + 4 + 49$

$(x-2)^2 + (y-7)^2 = 36$

Circle, $r = 6$, center $(2, 7)$

2. (3 points) Complete the square and state the type of graph:

$$x^2 + 4y^2 - 2x + 4y + \cancel{4} = 0$$
$$\underset{-2}{}$$

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

$(x^2 - 2x + 1) + 4(y^2 + y + \frac{1}{4}) = 2 + 1 + 1$

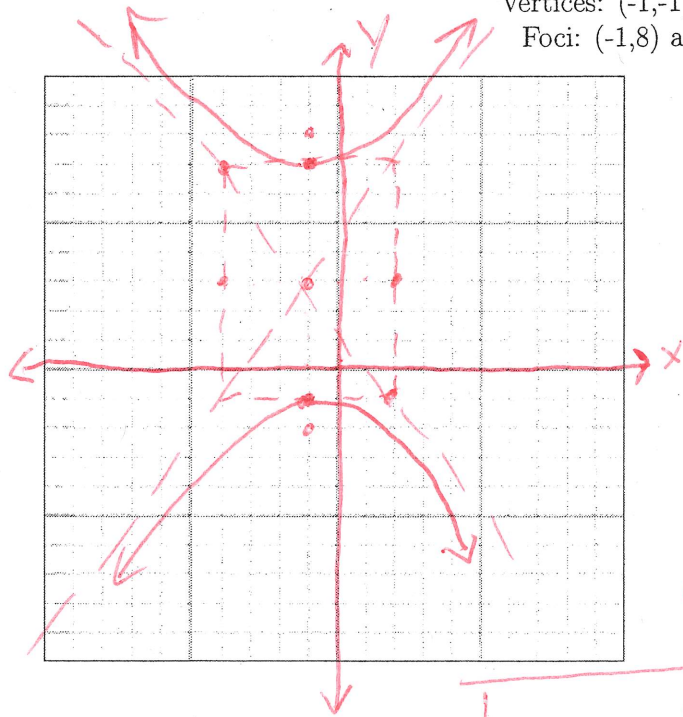$(x-1)^2 + 4(y + \frac{1}{2})^2 = 4$

$$\boxed{\frac{(x-1)^2}{4} + (y + \frac{1}{2})^2 = 1}$$

Please, show all work.

3. (6 points) Determine the equation of the hyperbola in standard form given:

Vertices: (-1,-1) and (-1,7)

Foci: (-1,8) and (-1,-2)

$b = 4 \Rightarrow b^2 = 16$

$c = 5 \Rightarrow c^2 = 25$

$c^2 = a^2 + b^2$

$25 = a^2 + 16$

$a^2 = 9 \Rightarrow a = \pm 3$

Center $\Rightarrow (-1, 3) = (h, k)$

$$\Rightarrow \quad -\frac{(x+1)^2}{9} + \frac{(y-3)}{16} = 1$$

Please, show all work.