

Quiz 5

Name: Key

Math 115, Fall 2016

Thursday Discussion Time: _____

Directions: You have 20 minutes to complete this quiz. Read each problem carefully. There is one problem on the back of this page. Please put a box around your answers. No calculators are allowed.

1. (5 points) Let $g(x) = x^2 + 2x + 5$. Parts (a) - (d) below refer to this function.

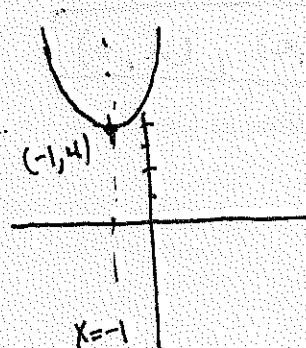
- (a) Write $g(x)$ in standard form.

$$g(x) = x^2 + 2x + 1 + 5 - 1 \quad ; \quad \left(\frac{b}{2}\right)^2 = \left(\frac{2}{2}\right)^2 = 1, \text{ add/subtract } 1$$
$$\boxed{g(x) = (x+1)^2 + 4}$$

- (b) Determine the vertex.

$$\text{Vertex} = \boxed{(-1, 4)}$$

- (c) Sketch the graph.



- (d) Determine the equation of the axis of symmetry.

$$x = -1$$

2. (1 point) State if the following is **True** or **False**.

It is possible that the **range** of a quadratic function is the set of all real numbers.

The statement is **False**. If the vertex is (h, k) the range is either $[k, \infty)$ ("opening up") or $(-\infty, k]$ ("opening down").

3. (4 points) Let $f(x) = 2x^3 - 8x$. Parts (a) - (c) below refer to this function.

(a) Determine the y -intercept.

$$f(0) = 0, \quad y\text{-intercept} = \boxed{(0, 0)}$$

(b) Determine all of the x -intercepts.

$$2x^3 - 8x = 0 \Rightarrow 2x(x^2 - 4) = 0$$

$$\Rightarrow 2x(x+2)(x-2) = 0$$

$$\Rightarrow x = 0, x = -2, x = 2$$

$$x\text{-intercepts: } \boxed{(0, 0), (-2, 0), (2, 0)}$$

(c) Complete the following sentence by filling in the blank.

As $x \rightarrow -\infty$, $f(x) \rightarrow \underline{-\infty}$.

The leading term is $2x^3$ so the end behavior is

