Quiz 4 Name: Key

Math 115, Fall 2016 Thursday Discussion Time: _____

Directions: You have 20 minutes to complete this quiz. Read each problem carefully. There are two problems on the back of this page. No calculators are allowed.

1. (4 points)

   Let $f(t) = \sqrt{t+4}$. Use this function for parts (a) and (b).

   (a) Evaluate $f(12)$.

   $f(12) = \sqrt{12+4} = \sqrt{16} = \boxed{4}$

   (b) Determine the domain of f. Write your answer in interval notation.

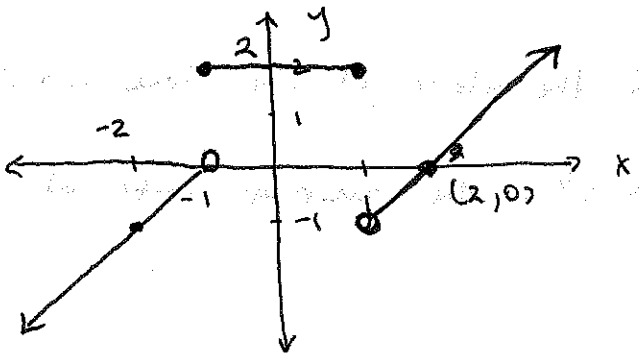
   $t + 4 \geq 0 \Rightarrow t \geq -4$

   $\boxed{\text{domain}(f) = [-4, \infty)}$

2. (3 points)

   Draw the graph of the function g given below. Use a closed dot for a point on the graph; use an open dot for a point not on the graph.

$$g(x) = \begin{cases} x+1 & \text{if } x < -1 \\ 2 & \text{if } -1 \leq x \leq 1 \\ x-2 & \text{if } x > 1 \end{cases}$$



3. (1 point)

Show that the function $h(x) = x^4 - x^2$ is even.

Observe $h(-x) = (-x)^4 - (-x)^2$

$= x^4 - x^2 = h(x)$.

Since $h(-x) = h(x)$, we know h is even.

4. (2 points)

Determine the average rate of change of the function $f(x) = 2x + 3$ on the interval $[-1, 4]$.

$$\text{average rate of change} = \frac{f(4) - f(-1)}{4 - (-1)}$$

$$= \frac{2(4) + 3 - (2(-1) + 3)}{5}$$

$$= \frac{11 - 1}{5}$$

$$= \boxed{2}$$

Note that 2 is the slope of the line $y = 2x + 3$. For linear functions, $y = mx + b$, the average rate of change is m.