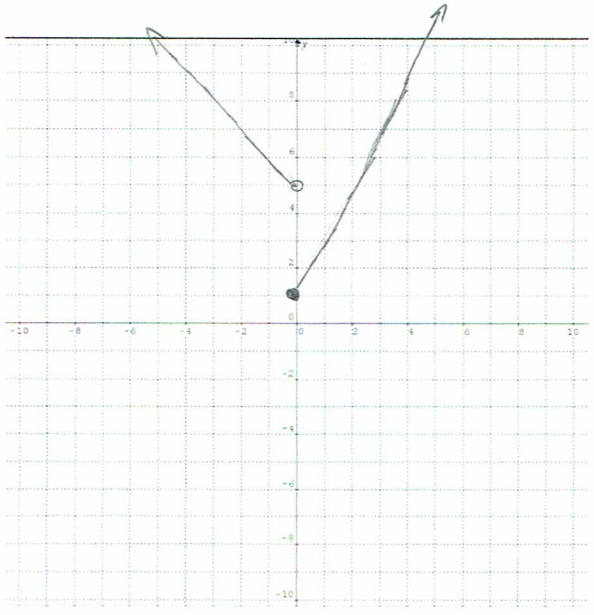
MATH 160 – QUIZ #1 *Name:* Key

Directions: Please show all work for maximum credit. This quiz is worth 16 points. Good luck!

(3 points) 1. Graph the following piecewise-defined function.

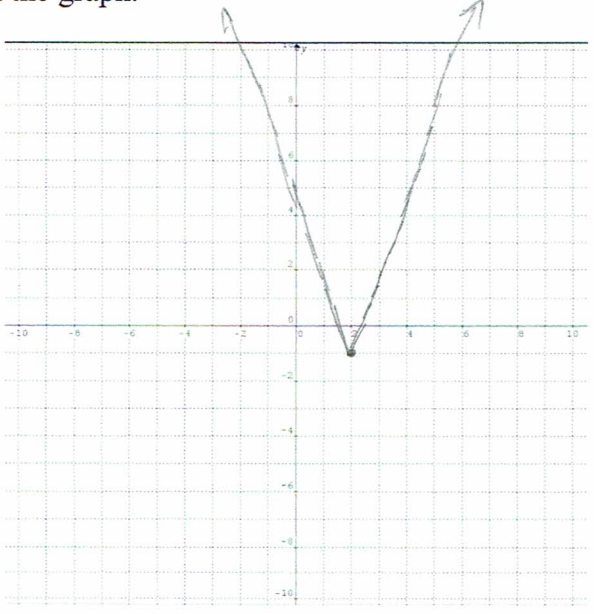
$$f(x)=\begin{cases}5-x & \text{if } x<0\\ 1+2x & \text{if } x\geq 0\end{cases}$$



(3 points) 2. Describe how a sketch of the graph of the following function is obtained using reflections, stretches, compressions, and shifts. Then, sketch the graph.

$$f(x)=3|x-2|-1$$

stretch by factor of 3
shift 2 units right
shift 1 unit down



3. Given $f(x)=\frac{x+2}{x-4}$ and $g(x)=\frac{x-6}{x+3}$. Determine the following:

(2 points) a. Domain $f+g$.

Domain $f = \{x \mid x \neq 4\}$

Domain $g = \{x \mid x \neq -3\}$

Domain $f+g = \{x \mid x \neq 4, -3\}$

(2 points) b. Domain $\frac{f}{g}$.

Domain $f = \{x \mid x \neq 4\}$

Domain $g = \{x \mid x \neq -3\}$

$g = 0$ when $x = 6$

Domain $\frac{f}{g} = \{x \mid x \neq 4, -3, 6\}$

(2 points) 4. Determine the domain of the following function: $f(x)=\sqrt{4x-5}$

$4x - 5 \geq 0$

$x \geq 5/4$

$[5/4, \infty)$

(2 points) 5. Algebraically determine if the following function is even, odd, or neither.

$$f(x)=\frac{x}{x^2-1}$$

$f(-x) = \frac{-x}{(-x)^2-1} = -\frac{x}{x^2-1} = -\left(\frac{x}{x^2-1}\right) = -f(x)$ $\therefore$ odd

(2 points) 6. Find the average rate of change from $x=1$ to $x=3$ of the following function.

$$f(x)=3x^2-2x$$

$f(3) = 3(3)^2 - 2(3) = 27 - 6 = 21$

$f(1) = 3(1)^2 - 2(1) = 3 - 2 = 1$

$\frac{f(3)-f(1)}{3-1} = \frac{21-1}{3-1} = \frac{20}{2} = 10$