Math 115 **Worksheet 5** **September 10, 2014**

Name _____
Group Members:

1. State the domain of each function using interval notation

   (a) $f(x) = x^2 + 3x - \frac{10}{x}$

   (b) $g(x) = \sqrt[3]{x^2 - 5x}$

   (c) $h(x) = \dfrac{x^2 + 2}{\sqrt{x^2 - 9} - \sqrt{5}}$

2. A farmer has 200 feet of fence to enclose a rectangular garden and also partition it in half. Express the area of the large rectangle as a function of x.

3. Find the zeros of the following functions

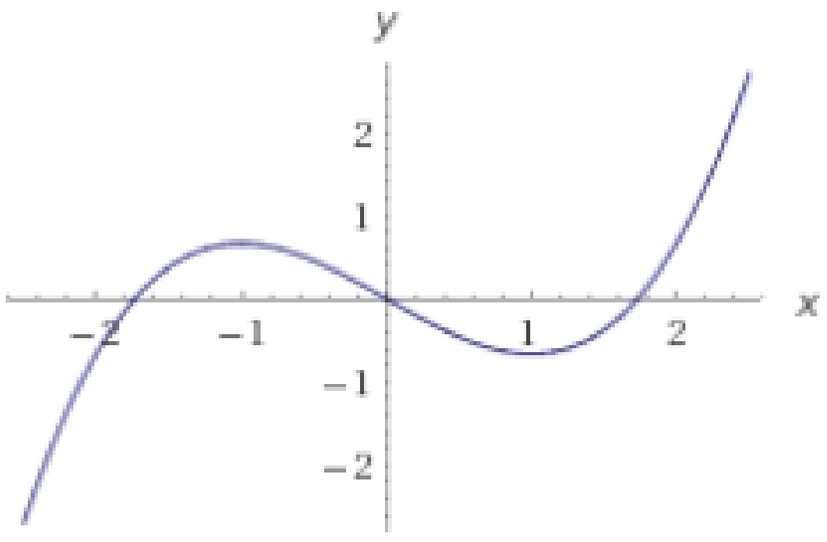
   (a) $f(x) = 3x^2 + x - 10$

   (b) $g(x) = \sqrt{10 - x^2}$

   (c) $h(x) = \dfrac{1}{x - 4}$

   (d) $p(x) = \dfrac{2x - 3}{x + 5}$

4. Describe the behavior of the function (intervals of increase, decrease, constant)

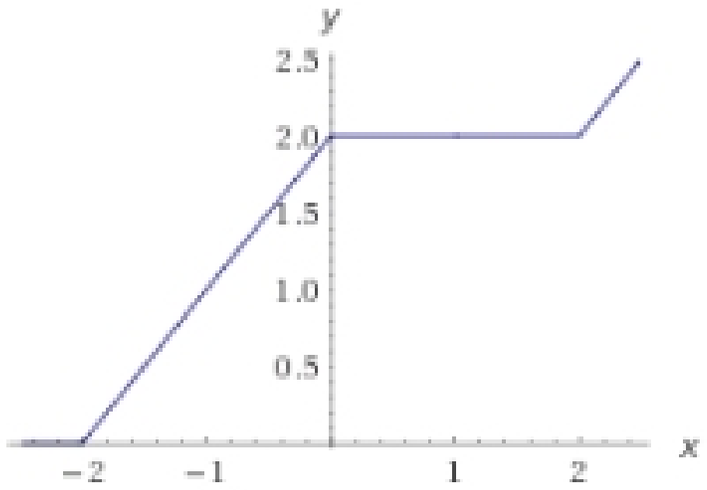


5. Find the average rate of change of the following functions in the given range

   (a) $f(x) = x^2 + 3x$ from -2 to 0

   (b) $g(x) = \begin{cases} x^2 & x < 0 \\ x^3 & x \geq 0 \end{cases}$ from -1 to 3

   (c) the function below from -1 to 1



6. Define the function from problem 5c on the interval $[-2, 3]$.

7. Determine whether the functions are even, odd, or neither.

   (a) $f(x) = x^3 + 4x$

   (b) $g(t) = 3t^4 + 1$

   (c) $h(x) = 3x^5 - x + 1$

8. Carefully graph the following functions, giving the domain and range in interval notation.

   (a) $f(x) = x$

   (b) $g(x) = |x|$

   (c) $h(x) = x^2$

   (d) $k(x) = \sqrt{x}$

   (e) $\ell(x) = \sqrt[3]{x}$

9. Carefully graph the following functions, giving the domain and range in interval notation. State what has changed from your graphs of problem 8.

   (a) $g(x) = |x + 2|$

   (b) $g(x) = |x| + 2$

   (c) $h(x) = x^2 - 1$

   (d) $h(x) = (x - 1)^2$

   (e) $k(x) = -\sqrt{x}$

   (f) $k(x) = \sqrt{-x}$

   (g) $\ell(x) = 3\sqrt[3]{x}$

   (h) $\ell(x) = \frac{1}{3}\sqrt[3]{x}$