Math 156 PRECALCULUS
Fall 2015

Quiz 5 – Version One

Thursday, October 15, 2015

Name:_____

This quiz has 6 problems worth a total of 30 points. It is TWO SIDED.

1. A weather balloon is filled with hydrogen at a rate of 4 cubic feet per second. Initially the balloon contains 5 cubic feet of hydrogen.

    (a) (3 points) Find a linear function V that models the volume of hydrogen in the balloon at any time t.

    (b) (3 points) If the balloon has a capacity of 25 cubic feet, how long does it take to completely fill the balloon?

2. (3 points each) For each function below, sketch the graph. (For people with limited art skills, like me, you are welcome to augment your picture with an explanation of the standard function you are transforming and how you are transforming it. For example, one might write, "This is the parabola $y = x^2$ translated 2 units to the left and stretched horizontally by a factor of 3.")

    (a) $y = |x + 1| - 4$

    (b) $y = 3 - \sqrt{x}$

3. (4 points) Express the function $H(x) = |1 - 2x^2|$ in the form $f \circ g$ in a nontrivial way. (That is, you are not allowed to choose $f(x) = x$ or $g(x) = x$.)

4. (3 points each) Find the inverse functions below:

  (a) $f(x) = \frac{3x+2}{2-5x}$

  (b) $g(x) = (x^3 - 2)^5$.

5. (4 points) For $f(x) = \frac{2}{x}$ and $g(x) = \frac{x}{x+3}$, find $(g \circ f)(x)$ and its domain.

6. (4 points) Use the Inverse Function Property to show that $f(x) = \frac{1}{x-1}$ and $g(x) = \frac{1}{x} + 1$ are inverses of each other