Name:_____

Math 105 Quiz #2 September 16, 2013

• This is a closed-book quiz. No books, notes, calculators, cell phones, communication devices of any sort, or webpages, or other aids are permitted.

• Please *show* all of your work and *justify* all of your answers.

1. [5 Points] Consider the function $f(x) = 1 + \dfrac{1}{x}$. Express $f(f(x))$ as a single fraction.

2. [5 Points] Let $f(x) = x + 1$. Let $g(x) = \sqrt{x+6}$.

(a) Compute $f \circ g(x)$. Then sketch the graph for $f \circ g$.

(b) Compute $g \circ f(x)$. Then sketch the graph for $g \circ f$.

(c) Does $f \circ g = g \circ f$? Explain your answer.

3. [5 Points] Consider the function defined piece-wise by $f(x) = \begin{cases} x+1 & \text{if } x \leq 0 \\ -x^2+6 & \text{if } x > 0 \end{cases}$

Graph $f(x)$ and state its Domain and Range.

4. [5 Points] Consider the function defined piece-wise by $f(x) = \begin{cases} \frac{1}{x} & \text{if } x > 0 \\ x-3 & \text{if } -1 \leq x < 0 \\ -4 & \text{if } x < -1 \end{cases}$

Graph $f(x)$ and state its Domain and Range.