MAT 121-G81 Test 1 – Spring, 2014 Name_____
100 Points Covers Chapter 1 NO GRAPHING CALCULATORS!!!

1. (10 pts) What is the domain of the function $f(x)=\sqrt{3x+2}$?

2. (5 pts) Let $f(x)=\dfrac{x^2+2x}{2x-1}$. Find the following values:

   a. $f(2)$

   b. $f(-3)$

3. (10 pts) What is the average rate of change of the function $f(x)=\sqrt{x-1}$ from $x=5$ to $x=10$?

4. (10 pts) Find and simplify the difference quotient for $f(x)=x^2-5x$, that is, simplify $\dfrac{f(x+h)-f(x)}{h}$.

5. Let $f(x)=\dfrac{x-2}{x-3}$ and $g(x)=\sqrt{3x+2}$.

a. (5 pts) What is the domain of f?

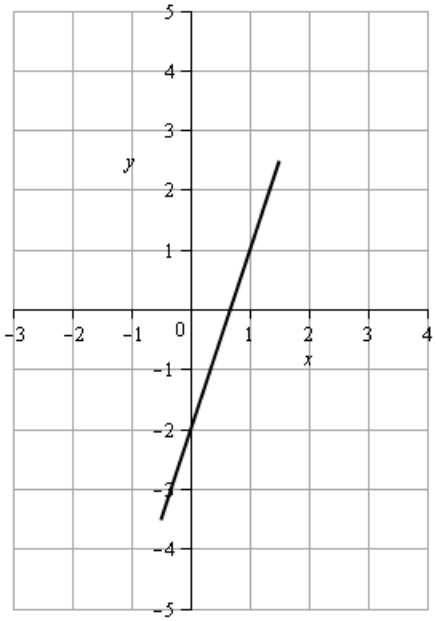
b. (5 pts) What is the domain of g?

c. (5 pts) Write the function $(f-g)(x)$. Do not simplify. What is its domain?

d. (5 pts) Write the function $\left(\dfrac{f}{g}\right)(x)$. Do not simplify. What is its domain?

e. (5 pts) Write the function $(f\circ g)(x)$. Do not simplify. What is its domain?

6. (10 pts) Determine the equation of the line from its graph. Give the equation in…
   a. … point-slope form and
   b. … slope-intercept form.



7. Graph each of the following by the techniques of shifting, stretching, compressing or reflecting. Start with the graph of a basic function and show all steps. I expect to see 3 points labeled in the first sketch, and to see where those points are moved to in each subsequent step.

   a. (10 pts) $g(x) = -3\sqrt{-x+2} - 3$

b. (10 pts) $g(x)=\frac{1}{2}(x+2)^2+5$

8. (10 pts) Sketch the graph of the piecewise-defined function $f(x)=\begin{cases}2-x^2 & \text{if } -2\le x<1\\ x-1 & \text{if } 1\le x\le 2\end{cases}$