MAT 121-G11 – Fall, 2011 Test 2

Chapter 2 Name________________________

1. (10 pts) $f = \{(1,-1),(2,4),(3,2),(4,3)\}$

   a. Function? (Yes/no)

   b. If not, why not?

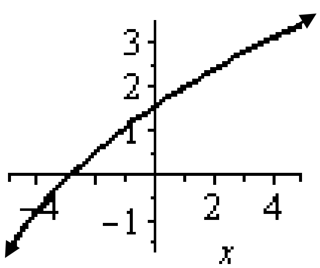
   c. 1-to-1? (Yes/no)

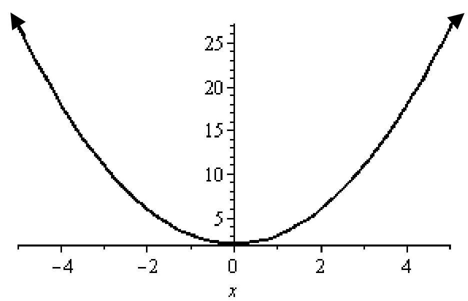
   d. If not, why not?

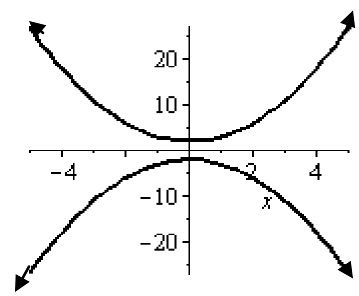
   e. What's the domain?

   f. What's the range?

2. (10 pts) For each of the following graphs, determine if the relation is a function. If it is a function, state whether or not it is 1-to-1.







Is it a function?	Is it a function?	Is it a function?
Is it 1-to-1?	Is it 1-to-1?	Is it 1-to-1?
Domain?	Domain?	Domain?
Range?	Range?	Range?

3. (10 pts) Let $f(x) = x^2 - 7$. Simplify the difference quotient $\dfrac{f(x+h) - f(x)}{h}$.

4. (5 pts) Determine whether or not $\sqrt[3]{y}+x=7$ defines y as a function of x. If it does not, show/explain why not. (Solve for y and look at how many solutions you get.)

5. Let $f(x)=\dfrac{x+2}{x-11}$ and $g(x)=\sqrt{x+8}$.

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

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

c. (5 pts) Find $(f \circ g)(x)$. (Do not simplify.)

d. (5 pts) What is the domain of $(f \circ g)(x)$?

Still working with $f(x) = \dfrac{x+5}{x-6}$ and $g(x) = \sqrt{x+8}$.

e. Determine each of the following functions (without simplifying) and state the domain of each in *interval notation*.

i. (5 pts) $(f+g)(x)$

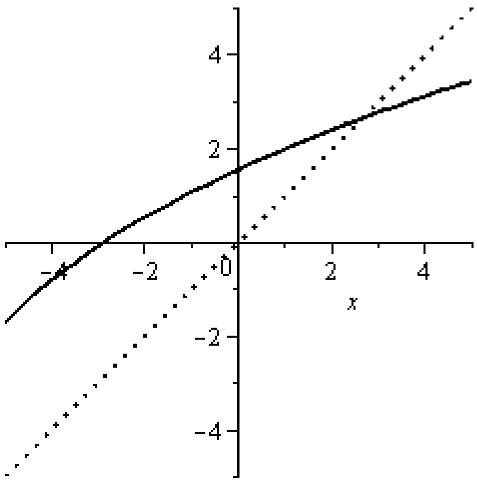
ii. (5 pts) $\left(\dfrac{f}{g}\right)(x)$

6. (5 pts) Answer *one* of the following:

a. Show that $f(x) = \dfrac{x+5}{x-11}$ is 1-to-1, algebraically.

b. Let $f(x) = \dfrac{x+5}{x-11}$. Find $f^{-1}(x)$.

7. (5 pts) The graph of f is given. Sketch the graph of f^{-1}.



8. (5 pts) If y varies jointly as x and w and inversely with the cube of r, write the equation describing this relationship. What is y if $x = 3$, $w = 2$, and $r = 7$?

9. Graph each of the following functions using techniques of shifting, compressing, stretching, and/or reflecting. Start with the graph of the basic function and show all stages in separate sketches. **Track 3 key points through the transformations**.

a. (5 pts) $g(x) = 2|x+5| + 4$

#9, continued... Graph using transformations.

b. (5 pts) $h(x) = \dfrac{1}{x-2} + 3$

10. Solve the absolute value inequalities:

a. (5 pts) $|2x-3| - 1 > 5$

b. (5 pts) $|2x-3| - 1 \le -5$