MAT 121-G11 – Fall, 2011 Test 2
Chapter 2 Name_____

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

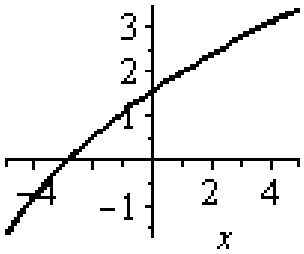
   a. Function? (Yes/no)

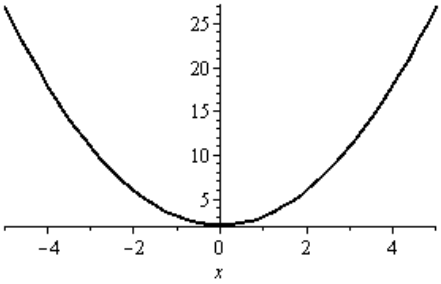
   b. If not, why not?

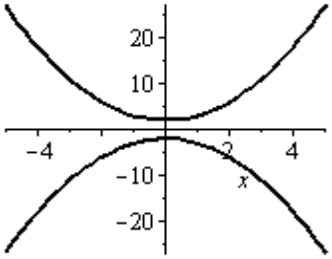
   c. What's the domain?

   d. 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?

If it is a function, is it 1-to-1? If it is a function, is it 1-to-1? If it is a function, is it 1-to-1?

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

4. (5 pts) Determine whether or not $y^2 - 2x = 5$ 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 $f(x) = \dfrac{x+5}{x-6}$ 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) $(f+g)(x)$

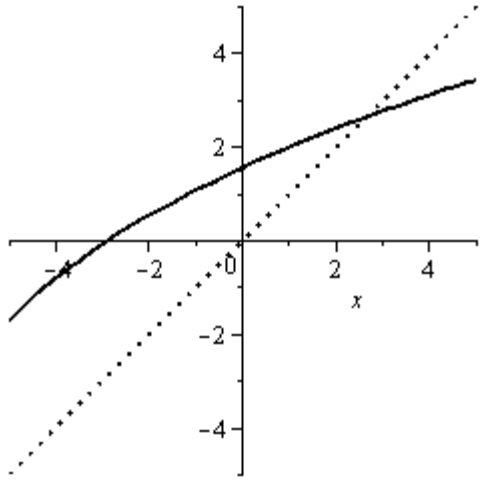
ii. (5 pts) $\left(\dfrac{f}{g}\right)(x)$

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

a. Show that $f(x)=\dfrac{x+3}{x-1}$ is 1-to-1, algebraically.

b. Let $f(x)=\dfrac{x+3}{x-1}$. Find $f^{-1}(x)$.

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



8. (5 pts) If f varies jointly as x and w and inversely with the cube of r, write the equation describing this relationship.

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) $h(x) = 2\sqrt{9-3x}$ Hint: $9-3x = -3x+9 = -3(x-3)$

10. Solve the absolute value inequalities:

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

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