MAT 121 – Spring, 2011 Test 2
Chapter 2 (5 pts) Name_____

1. (10 pts) $f = \{(1,-1),(2,4),(3,2),(4,5)\}$

   a. Function? (Yes/no)

   b. If not, why not?

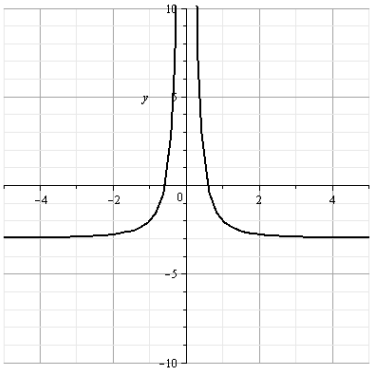
   c. If it *is* a function, is it 1-to-1? (Yes/no)

   d. If it is *not* 1-to-1, why not?

   e. What's the domain?

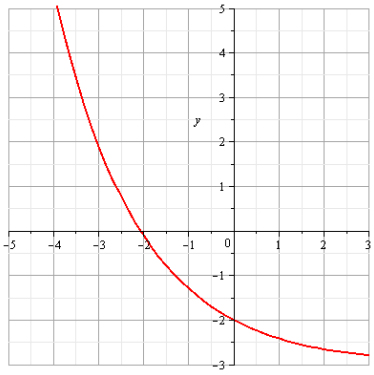
   f. What's the range?

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.



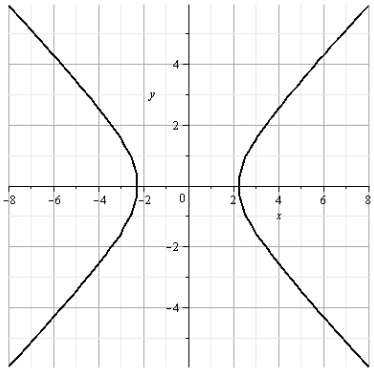
Is it a function?

Is it 1-to-1?



Is it a function?

Is it 1-to-1?



Is it a function?

Is it 1-to-1?

3. (5 pts) Determine whether or not $|x+3|-2y=5$ 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.)

4. (10 pts) Let $f(x)=x^2+3$. Simplify the difference quotient $\frac{f(x+h)-f(x)}{h}$.

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

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 $(f\circ g)(x)$?

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

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

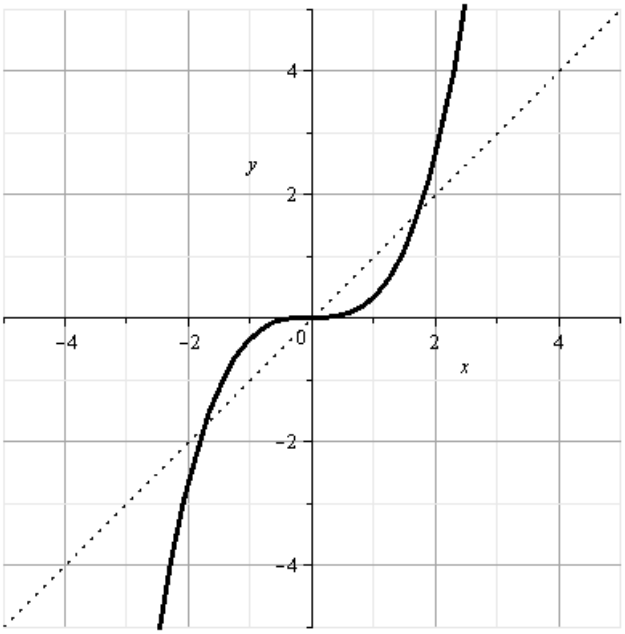
ii. (5 pts) $\left(\dfrac{g}{f}\right)(x)$

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

   a. Show that $f(x)=\dfrac{x-1}{x+2}$ is 1-to-1, algebraically.

   b. Let $f(x)=\dfrac{x-1}{x+2}$. 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 q^2 and h, and f = - 36 when q = 3 and h = 2, find f when q = 4 and h = 2.

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) $h(x) = 3(x+5)^2 + 1$

#9, continued... Graph using transformations.

b. (5 pts) $g(x) = \sqrt{3-x} + 5$ (Hint: $3 - x = -x + 3$ is one way. $3 - x = -(x - 3)$ is another.)

10. (5 pts) Find the inverse of $f(x) = 3x - 7$