MAT 121 – Fall, 2010 Test 2
Chapter 2 Name_____

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

   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. Domain?

   f. Range?

2. (5 pts) $g = \{(2,-2),(4,6),(3,2),(11,5)\}$

   a. Function? (Yes/no)

   b. If not, why not?

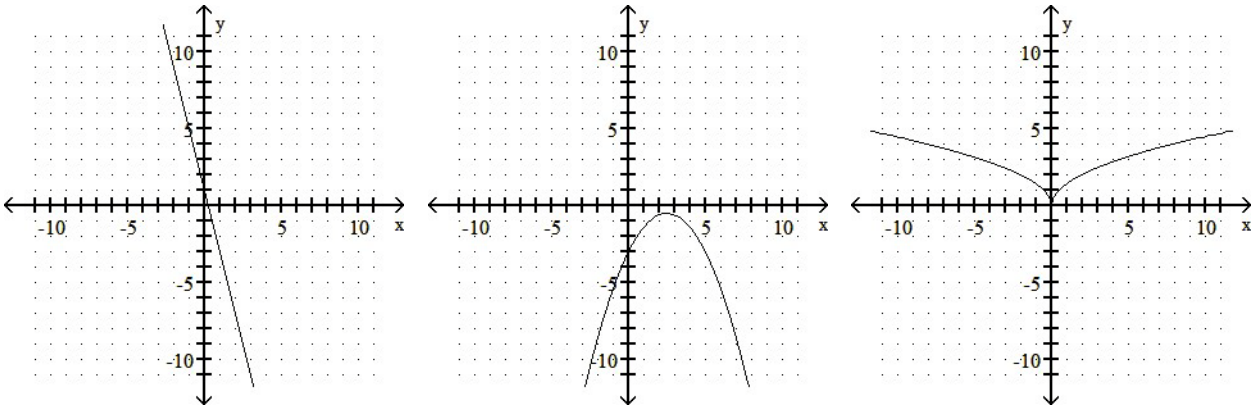
   c. If it *is* a function, is it 1-to-1? (Yes/no)

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

   e. Domain?

   f. Range?

3. (5 pts) Use the horizontal line test to determine if the following functions are 1-to-1 (Yes/No for each graph).



4. (5 pts) Determine whether or not $|y-2|+x=7$ defines y as a function of x. If it does not, show/explain why not.

5. (10 pts) Let $f(x)=x^2-5$. Simplify the difference quotient $\dfrac{f(x+h)-f(x)}{h}$.

6. Let $f(x) = 3x - 5$ and $g(x) = \sqrt{x+7}$.

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

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

c. Determine each of the following functions and state the domain of each in interval notation.

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

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

iii. (5 pts) $(f \circ g)(x)$

iv. (5 pts) $(g \circ f)(x)$

7. (5 pts) Show that $f(x) = \dfrac{x+1}{x-3}$ is 1-to-1.

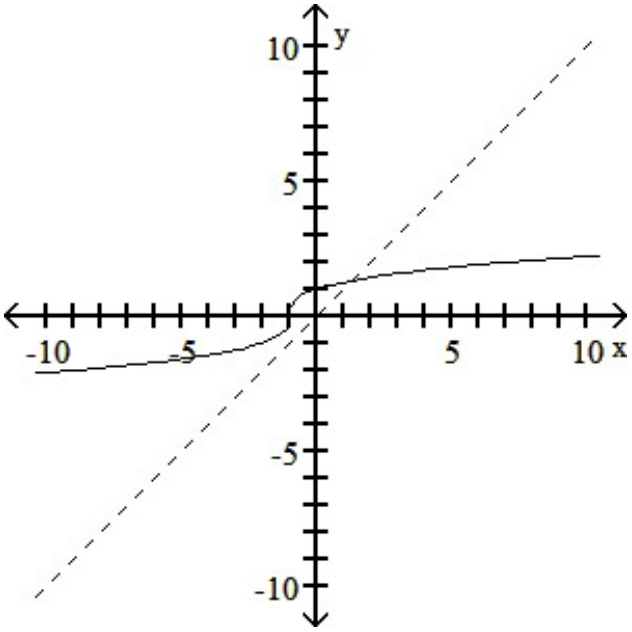
8. (5 pts) Let $f(x) = \dfrac{x+1}{x-3}$. Find $f^{-1}(x)$.

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) $g(x) = \sqrt{x-3} + 5$

b. (5 pts) $h(x) = -2(x+5)^2 - 3$

10. (5 pts) The graph of f is given. Sketch the graph of f^{-1}.



11. (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 $h = 2$.

12. (5 pts) Find the inverse of $f(x) = 3x - 7$