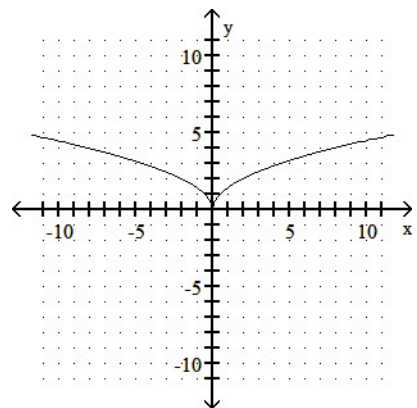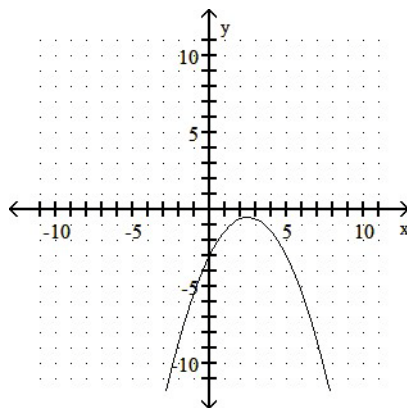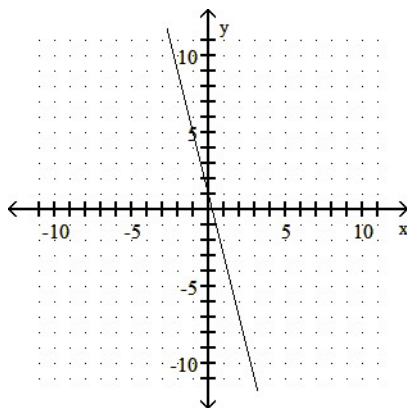1. (10 pts) $f = \{(2,-1),(3,-2),(4,2),(3,4)\}$

    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) $\left(\dfrac{g}{f}\right)(x)$

   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}.
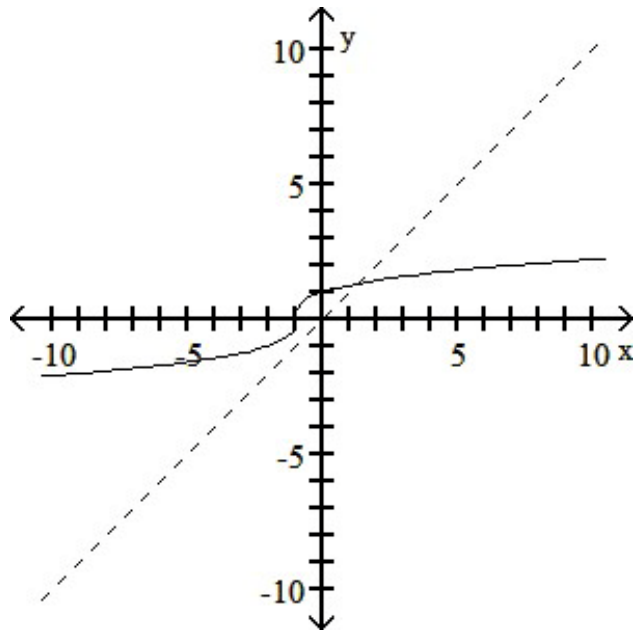
11. (5 pts) If f varies jointly as q^2 and h, and $f = -36$ when $q = 3$ and $h = 2$, find f when $q = 4$ and $h = 2$.

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