

Show all work for credit. Do all your work neatly on the paper provided. Write your name on each sheet you turn in. I will **not** grade any work done on the test sheet. When you are finished turn in all sheets including the test. Good Luck.

1. Solve the system.

$$x - y = 0$$

$$5x - 3y = 10$$

2. Solve the system.

$$y = 4x$$

$$y = x^2 - 5$$

3. Write an equation for each of the following lines:

(a) The line that passes through the points  $(1, 2)$  and  $(-2, 3)$ .

(b) The line that passes through the point  $(3, -2)$  which is perpendicular to the line  $3y - 9x = 17$ .

4. Find the domain of  $f(x) = \frac{1}{3x + 12}$  and the domain of the function  $g(y) = \sqrt{2 - y}$ .

5. Sketch the graph of the following functions.

(a)  $f(x) = x^2 - 4$       (b)  $g(x) = (x + 3)^3$       (c)  $h(x) = |x - 4|$

6. Using the three functions given above do the following:

(a) Find  $(f + g)(0)$

(b) Find  $g(f(x))$

(c) Give the intervals on which  $f$  is increasing.

(d) Which functions are not one-to one? Explain why not.

7. Given the function  $f(x) = \frac{3x + 5}{2}$ . Find the inverse,  $f^{-1}(x)$ , and show  $f(f^{-1}(x)) = f^{-1}(f(x)) = x$ .

8. Given the following table for a function  $f$  with inverse,  $f^{-1}$ :

$x$	1	2	3	4	5
$f(x)$	2	4	3	5	1

Find  $f^{-1}(3), f^{-1}(4)$  and  $f^{-1}(2)$ .