name _____

homework #3, math 102, fall 2008

instructions: put all answers on the homework sheet and attach pages to show work. all work must be shown to receive credit. all answers must be exact unless otherwise indicated. simplify answers as much as possible even if not specifically noted.

1. solve the following problem numerically: the high temperature for a particular week in jackson, mississippi can be described by the quadratic model $y = 1.05x^2 - 8.38x + 89.43$ where x is the day of the week (sunday = 1, monday = 2, … saturday = 7), and y is the temperature in degrees fahrenheit. (you should give your table in the work pages.)
   a. find the day of the week with the lowest temperature.

   b. what is the lowest temperature for the week, rounded to the nearest tenth?

   c. do you think that this equation models the temperature for much longer than a week, say, 2 weeks? why or why not?

2. solve the following equations for the specified variable.
   a. $A = 3M - 2N$ for n

   b. $A = \mathrm{Pr}t + P$ for p

   c. $s = \frac{n}{2}(a + L)$ for L

   d. $T = 3vs - 4ws + 5vw$ for v

3. the cassini spacecraft mission to saturn was launched october 15, 1997. it took more than 6 ½ years to reach saturn, arriving in july 2004. during its mission, cassini will travel a total distance of 2 billion miles in 80.5 months. find the average speed of the spacecraft in miles per hour. (hint: don't forget to covert months to hours!)

4. give the quadrants the following points belong in. if they are not in a quadrant, which axis (axes) do they fall on.
   a. (4,1)

   b. (-3,-6)

c. (0,2)

d. (-1,5)

e. (7,0)

f. (0,0)

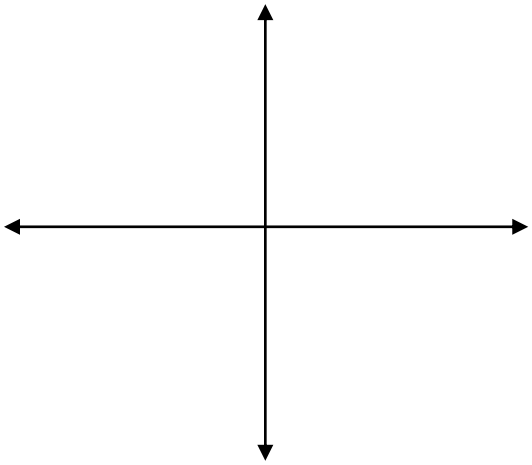
g. (1/2, -4.1)

5. for the following equations, sketch the graph and determine if the graph is linear or nonlinear, and if nonlinear, is it a parabola, a cubic or a v-shaped graph?

equation	linear or nonlinear?	if nonlinear, what kind?	graph
$3x+4y=11$			
$4-2x-x^2=y$			
$y=6x$			

$y = x^2(x-1)$			
$y = 1-\|2x-5\|$			
$y = x^3 - 6$			
$y = (x+2)x$			

6. sketch the graph of the equation $|x| - 2 = y$ using the values x= -3, -2, -1, 0, 1, 2, 3. label each point clearly on the graph below.



7. solve the following inequalities. write each solution in i. set notation, ii. on a number line, iii. in interval notation.

a. $-x > -2$

b. $\frac{3}{4} - \frac{2}{3} > -\frac{x}{6}$

c. $7x < 7(x-2)$

d. $\frac{-x+2}{2} - \frac{1-5x}{8} < -1$

e. $7(2x+3) + 4x \leq 7 + 5(3x-4)$

f. $-\frac{1}{2} < x < \frac{3}{2}$

g. $\frac{1}{3}(x-10) - 4x > \frac{5}{6}(2x+1) - 1$

8. a. define a relation. b. define a function. c. give an example of a relation that is not a function and explain why it is not.

9. determine if the set {(6,6), (5,6), (5,-2), (7,6)} is a function. if not, why not.