Grima MAT 151
Chapter 4 – extra practice test

1) Suppose f(x) =-6x + 10   and g(x) = 14x + 30
a) Solve f(x) = 0
b) Solve f(x) > 0
c) Solve f(x) = g(x)
d) Solve f(x) < g(x)

2) Suppose that the number of a units of a certain product that will be supplied (S) at price (p) (in dollars) is given by the equation:

$$S(p) = 11p - 2$$

Suppose that number of units of the same product that will be demanded (D) at price (p) (in dollars) is given by the equation:

$$D(p) = -3p + 26$$

a) How many units of the product will be supplied at a price of $3?
b) How many units of the product will be demanded at a price of $3?
c) At a price of $3 does the supply exceed demand, or does demand exceed supply?
d) Find the equilibrium price.
e) How many units of the product will be supplied at the equilibrium price?
f) How many units of the product will be demanded at the equilibrium price?

3) A company makes a single product. The monthly cost (C) to make x units of the product can be found using the cost equation:

$$C(x) = 6x + 250$$

The monthly revenue (R) earned from selling x units of the product can be found using the revenue equation:

$$R(x) = 16x$$

a) Find the cost of making 30 units of the product during a month.
b) Find the monthly revenue earned by selling 30 units of the product.
c) Is there a profit or loss when 30 units of the product are produced and sold in a month?
d) What is the amount of the profit or loss?
e) Find the break-even quantity.
f) What is the monthly cost at the break-even quantity?
g) What is the monthly revenue at the break-even quantity?
h) What is the monthly profit at the break-even quantity?

4) Use the data provided to complete the following:

x	1	2	3	4	5
y	12	20	30	38	50

a) Use the linear regression feature on your calculator to find the equation of the line of best fit.

b) Use the equation to predict the y-value that corresponds to x = 8.

5) The data below shows the gas mileage (in miles per gallon) and the weight (in pounds) of certain cars.

Weight (in pounds)	Gas mileage
2000	35
4500	17
3000	26
4700	15
2300	33
4000	21

a) Use the linear regression feature on your calculator to find the equation of the line of best fit. (round to 4-decimals)

b) Use the equation to predict the gas mileage of a car that weighs 3600 pounds. (round to the nearest integer)

6) Let $f(x) = x^2$

a) Find $f(x - 5) + 4$

b) describe the transformation as compared to the function
f(x) = x², specifically state if the graph is shifted left, right, up, down and if any reflection has occurred

c) make a table of values

d) Sketch a graph of the function

e) state the domain of the function

f) state the range of the function

g) state the interval where the function in increasing

h) state the interval where the function is decreasing

i) state if the function has a local maximum point, if it does state the local maximum value

j) state if the function has a local minimum point, if it does state the local minimum value

7) $f(x) = 2x^2 + 24x + 9$

a) Use completing the square to rewrite the problem in standard form

b) Describe the transformation as compared to the function f(x) = x^2

8) A rocket fired vertically into the air it will be at a height (h) in feet, t seconds after launching, determined by the equation h = $- 16t^2 + 960t$.

a) How long does it take for the rocket to hit the ground?

b) When does the rocket reach its maximum height?

c) What is the maximum height of the rocket?

9) A chain store manager has been told by the main office that daily profit, P, is related to the number of clerks working that day, x, according to the equations P(x) = $-20x^2 + 800x$.

a) What number of clerks will maximize the profit?

b) What is the maximum possible profit?