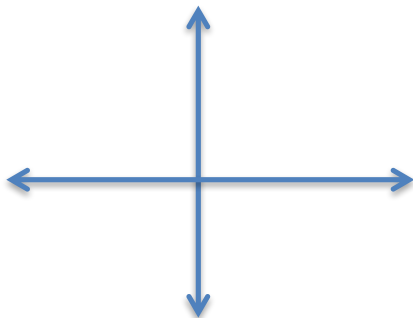1. Graph and answers questions about the function $f(x) = -3x + 7$ (5pts)

    -   what is the slope _____   what is the y intercept _____

    -   is f increasing, decreasing, or constant _____
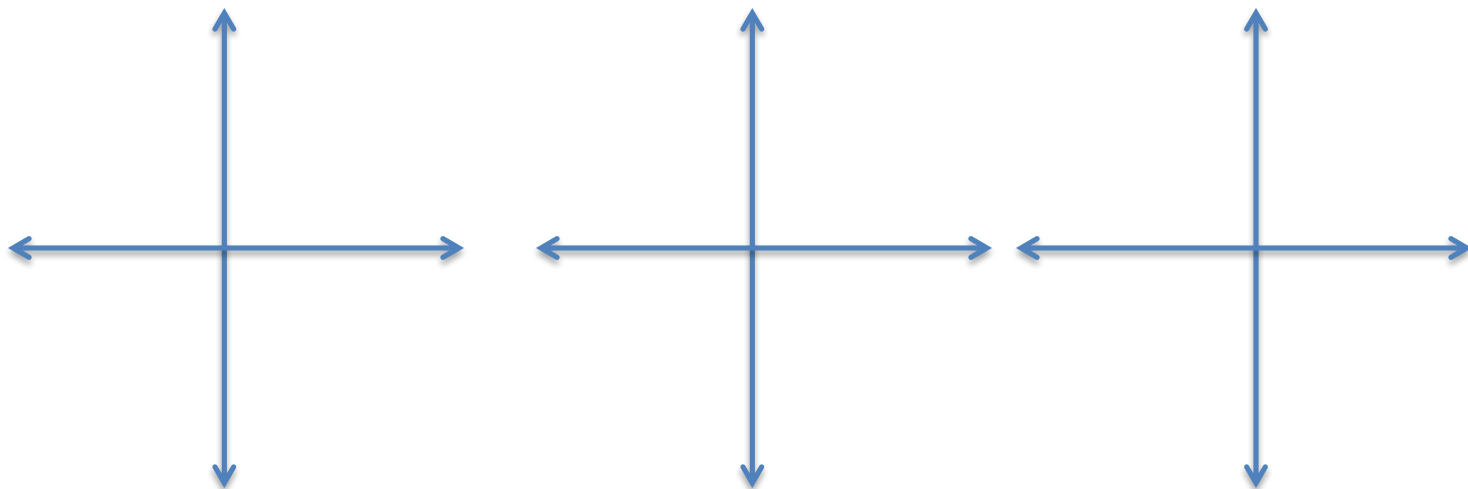
    -   Graph the function

2. Determine whether the given function is linear or nonlinear. If it is linear, determine the equation or the line. (5pts)

x	y
0	55
10	52.5
20	50
30	47.5
40	45

    - is the function Linear non linear _____

    - how do you know _____

    - write the equation of the line _____

3. Graph $f(x) = (x + 2)^2 - 2$ using transformations, graph the parent function (x^2) then the horizontal transformation, then the vertical transformation.
    Label two additional points in addition to the vertex. (PLEASE BE NEAT 10 pts)

*TO GET FULL CREDIT Remember to label the vertex and two additional points on EACH graph

4. Answer letters a-h about the function (25 pts) $f(x) = -2x^2 + 8x + 3$
   a) Does the graph open up or down   _____(1 pt)

   b.) use complete the square to find the vertex: $f(x) = a(x - h)^2 + k$
   MUST SHOW YOUR WORK FOR CREDIT
   $f(x) = -2x^2 + 8x + 3$

                                                        b =   _____(2 pts)

                                                        b/2 =   _____(2 pts)

                                                        $(b/2)^2 =$ _____(2 pts)

                                                        VERTEX = _____(3 pts)

   c.) what is the axis of symmetry? _____(1 pt) (just the x value)

   d.) what is the y intercept? _____(1 pt)

   e.) find the x intercepts _____ (must show your work below 5 pts)

   $$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

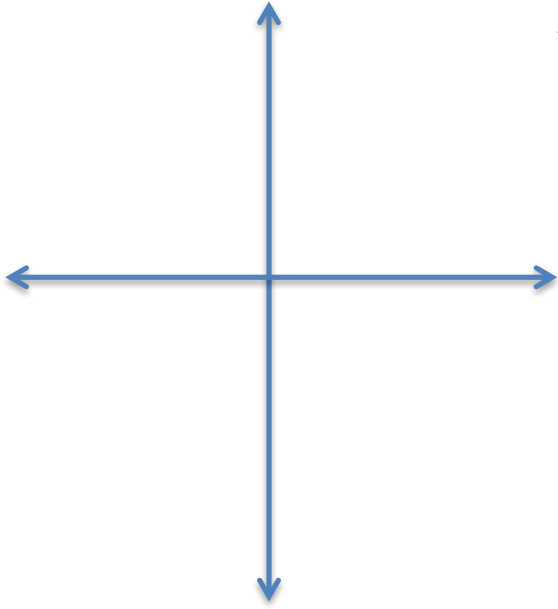   f.) what is the domain? _____ (1 pt)

   g) what is the range? _____ (2 pts)

   h.) what interval is it increasing ? _____ decreasing ? _____ (5 pt)

5. Write the quadratic function for the given graph _____(5pts)

SHOW YOUR WORK FOR FULL CREDIT

to help you start vertex form is: $f(x) = a(x - h)^2 + k$

h = _____

k = _____

vertex = _____

a = _____

6. Solve $x^2 + 4x - 12 \leq 0$ show work. <u>CAREFUL</u>! LOOK AT THE INEQUALITY (3 pts)

Interval notation _____ Inequality form _____

7. A company buys a new computer for $3,000 and uses straight-line depreciation over 3 years. Write a linear model that expresses the book value (V) of the computer as a function of its age x.

Slope= _____ y intercept _____ equation _____(3 pts)

What is the implied domain? _____ (2 pt)

How many years will it take to be worth $1,000? _____ (show work 2pts)

8.) Solve the maximizing revenue problem
The price p = -1/6 x + 100

Find a model that expresses the revenue as a function of x _____

What is the domain of R _____

What is the revenue if 150 units are sold _____

What quantity x maximizes revenue _____

What price should the company charge to maximize rvenue _____

EXTRA CREDIT (each problem is worth 3 pts if you get all correct 10 pts)

A.) Find the vertex of $2x^2 + 8x + 5$ by using: $\left(\frac{-b}{2a} , f\left(\frac{-b}{2a} \right) \right)$

You must show your work.

B.) Find the x intercepts of $2x^2 + 8x + 5$ by using the completing the square method
You must show your work and steps of how you got your answer.

C.) Given the quantity supplied S(p) = 60p – 900
and quantity demanded of D(p) = -15p + 2850

find the equilibrium price _____ (must show work)

equilibrium quantity? _____

BONUS for correctly graphing the curves and labeling (2 extra pts)