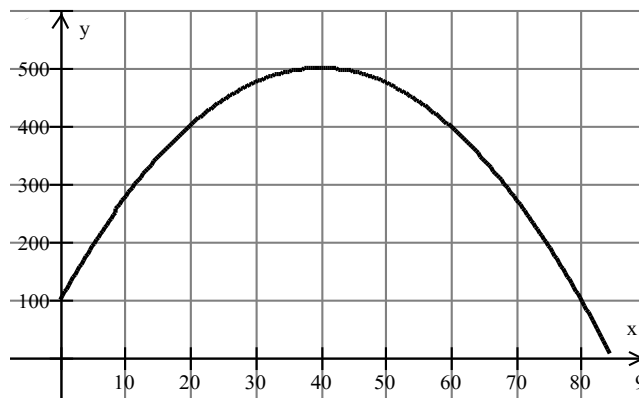


In this lab you will do several problems that will help your "remember" some your algebra skills. Completeness, neatness as well as accuracy are weighed when calculating your grade. You are encouraged to work in pairs or groups of 3 or 4. If you do work with more than one person, only hand-in one lab write-up per group with all names neatly written on the lab. Each person will receive the same grade in the group. To reward you for your group-work efforts you will each get 10% bonus added back to your score. This lab is due the next class meeting. We will have about a half hour that you can get together in your groups to compare answers and turn in your neatest selection. Write **ONLY YOUR ANSWERS HERE**, show additional work on a separate paper and staple it to this sheet. Late work turned in after Wednesday will be reduced by 50%. This lab is worth 48 points

1. A graph of the yield,  $y$ , of a cornfield (in bushels) against the amount,  $x$ , of fertilizer (in pounds) used on the field is shown. Each tic mark on the horizontal axis represents 10 and each vertical tic mark represents 100. (12 points)

a) Describe the effect of adding more and more fertilizer to the yield of the cornfield.



b) What is the vertical intercept as an ordered pair? What does it represent in the *context* of this problem?

c) Repeat part b) with the horizontal intercept.

d) What is the domain of this function represented by the drawing only? Describe in terms of corn and/or fertilizer.

e) Is the function increasing or decreasing at  $x = 50$ ? What does that mean in terms of fertilizer and corn?

f) What do the coordinates of the maximum of this graph represent and what are they?

2. (8 points) For  $f(x) = x^2 - 3x + 4$  evaluate and simplify (show work for parts b-d on your extra page):

a)  $f(3) =$

c)  $f(3 + h) - f(3) =$

b)  $f(3 + h) =$

d)  $\frac{f(3 + h) - f(3)}{h} =$

3. Explain how one finds the equation of a line: What is the necessary information? Make up an example using non-zero numbers and explain how it is done. Convince me you know how to do it. (6 points)

4. Solve the following system of equations. You may do this graphically (carefully sketch the graphs) using your calculator or algebraically (show work). Just be sure and show me how you did it. Express your solution(s) as an ordered pair. If you get decimal answers, round to the nearest thousandth (that's 3 decimal places). (6 points)

$$3x - 2y = 9 \text{ and } y = -x^2 + 2x$$

5. Find the domain of the following functions. Use interval OR set-builder notation  $\rightarrow \{x \mid \text{"conditions"}\}$ . (8 points)

$$\text{a) } f(x) = \frac{3x + 6}{x^2 - 9} \quad \text{b) } g(x) = \sqrt{9 - x} \quad \text{c) } h(x) = \frac{\sqrt{x + 5}}{x - 1} \quad \text{d) } k(x) = \frac{3x - 6}{x^2 + 4}$$

6. Let  $f(x) = 3x - 6$ ;  $g(x) = x^2 - 3x + 2$ ;  $h(x) = 4/x$ . Evaluate the following (show work for each, 8 pts):

a)  $f(2 + g(0)) =$

b)  $(f - g)(1) =$

c)  $(fh)(2) =$

d)  $(f/g)(0) =$

e)  $(h \circ f)(2) =$

f)  $(f \circ g)(2) =$

g)  $(g \circ f \circ h)(1) =$

h) Find all the x-values where  $f(x) = g(x)$