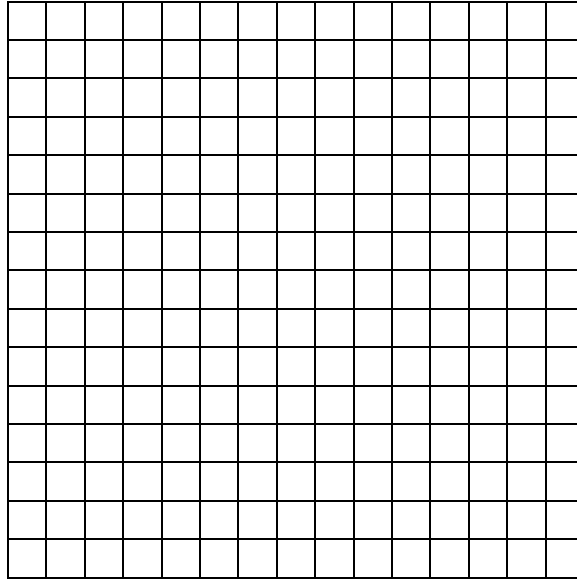


**Honors 125**  
Homework #2

Name \_\_\_\_\_  
Due Wednesday, September 23, 2009

1. On the graph paper below, carefully graph the quadratic function  $f(x) = x^2 + 6x + 8$ . On your graph indicate both coordinates of the vertex, the y-intercept, and the x-intercept(s), if any.



2. A tire manufacturer determines that when he sells a certain kind of tire for \$80 per tire, he can sell 600 tires per month, but when he raises the price to \$90 per tire, he can only sell 480 tires per month.
- Construct a linear demand function for the tire manufacturer as a function of the selling price  $p$  of a tire.
  - At what price should the manufacturer sell his tires to maximize his **revenue**?
  - The manufacturer further determines that the cost of producing is \$20 per tire, and his fixed costs allocable to tire production are about \$6300 per month. Construct a total cost function for the manufacture of tires as a function of the selling price  $p$  of a tire.
  - At what price should the manufacturer sell the tires in order to maximize his **profit**?
  - For what range of sale prices will the manufacturer make a profit from the sale of tires?

3. Simplify the expression  $\sqrt[4]{81z^8(x^4 + y^4)}$ , given that  $x$ ,  $y$ , and  $z$  are positive real numbers.

4. Consider the table below:

$x$	$f(x)$	$g(x)$	$h(x)$
-2	10	10	16
-1	7	20	8
0	4	40	4
1	1	70	2
2	-2	110	1

- a) Which, if any, of the functions above could be linear? Justify your answer. Find formula(s) for those function(s).
- b) Which, if any, of the functions above could be exponential? Justify your answer. Find formula(s) for those function(s).
5. Find the equation for an exponential function that passes through the points (1, 40) and (2, 10).
6. Let  $f(x) = Ab^x$ . Sketch a graph which meets all of the following criteria, or explain why it cannot be done:
- $A \geq 0$
  - $0 < b < 1$
  - The function passes through the point (2,4).