HOMEWORK 3 - MATH 140

DUE DATE: Wednesday, September 22
INSTRUCTOR: George Voutsadakis

Read each problem very carefully before starting to solve it. One part of each homework problem will be chosen at random and graded. Each question is worth 1 point. It is necessary to show your work. Correct answers without explanations are worth 0 points.

GOOD LUCK!!

1. Solve the quadratic equations
   (a) $2x^2 + 5x + 3 = 0$
   (b) $6x^2 + 7x - 20 = 0$
2. The area of a rectangular window is to be 306 square centimeters. If the length exceeds the width by 1 centimeter what are the dimensions?
3. Study (find vertex, say whether it opens up or down, find x and y-intercepts and roughly sketch the graph) the function $f(x) = -x^2 + 4x$.
4. Study the function $f(x) = 3x^2 - 8x + 2$.
5. The marginal cost C in dollars of manufacturing x cell phones is given by $C(x) = 5x^2 - 200x + 4000$. How many cell phones should be manufactured to minimize the marginal cost? What is the minimum marginal cost?
6. Solve the following inequalities
   (a) $25x^2 + 16 < 40x$
   (b) $x^2 + 7x < -12$
7. Solve the quadratic inequality $f(x) > g(x)$, where $f(x) = x^2 - 2x + 1$ and $g(x) = -x^2 + 1$.
8. Suppose that we have 3000 feet of fencing to enclose a rectangular field.
   (a) Express the area A of the rectangle as a function of the length x of the rectangle.
   (b) For what value of x is the area largest?
   (c) What is the maximum area?