3.3b More Optimization Examples

We've talked about the fact that real world problems can very often be described mathematically. When the mathematical description includes functions, then Calculus becomes a very powerful tool. **We need to keep in mind, though, that the functions we use to describe the real world will necessarily have "restricted" domains**. The restrictions to the domains arise from **constraints imposed by real world conditions**. Understanding and incorporating these constraints into the mathematical descriptions of our problems is an art worth learning, and **must be used if we hope to employ the EVT**!

Example 3.3.3

From your text: Pg. 152 #5

A rectangular piece of land is to be fenced using two kinds of fencing. Two opposite sides will be fenced using standard fencing that costs \$6/m, while the other two sides will require heavy-duty fencing that costs \$9/m. What are the dimensions of the rectangular lot of greatest area that can be fenced for a cost of \$9000?

Example 3.3.4

From your text: Pg. 152 #7

A bus service carries 10 000 people daily between Ajax and Union Station, and the company has space to serve up to 15 000 people per day. The cost to ride the bus is $20. Market research shows that if the fare increases by $0.50, 200 fewer people will ride the bus. What fare should be charged to get the maximum revenue, given that the bus company must have at least $130 000 in fares a day to cover operating costs?

Example 3.3.5

From your text: Pg. 153 #10

The cost of producing an ordinary cylindrical tin can is determined by the materials used for the wall and the end pieces. If the end pieces are twice as expensive per square centimetre as the wall, find the dimensions (to the nearest millimetre) to make a 1000 cm^3 can at minimal cost.

Class/Homework for Section 3.3b

Pg. 151 – 154 #3 – 7, 9 – 11, 14, 15