Applied Optimization - Handout/Worksheet

The Closed Interval Method: To find the absolute maximum and minimum values of a continuous function f on a closed interval $[a, b]$

1. Find the values of f at the critical numbers of f in (a, b).
2. Find the values of f at the endpoints.
3. The largest value from 1. and 2. is the absolute maximum. The smallest value from 1. and 2. is the absolute minimum.

1. A farmer has 2,400 feet of fencing and wants to fence off a rectangular field that borders a straight river. He needs no fence along the river. What are the dimensions of the field that has the largest area?

2. An open box is to be made from a 16 inch by 30 inch piece of of cardboard by cutting out squares of equal size from the 4 corners and bending up the sides. What size should the squares be to obtain a box with largest possible volume?

3. A closed cylindrical can is to hold 1 liter (1000 cm^3) of liquid. How should we choose the height and radius to minimize the amount of material needed to manufacture the can?