

3.7 Optimization Problems

Example: How should two nonnegative numbers be chosen so that their sum is one and the sum of their squares is:

- a) as large as possible?
- b) as small as possible?

Example: A rectangular plot of land is to be fenced off. Two opposite sides will use fencing costing \$3/m and the remaining sides will use fencing costing \$4/m. What are the dimensions of the rectangular plot of the greatest area that can be fenced in at a cost of \$1200?

Example: An open box is to be made from a 20cm square piece of cardboard by cutting out squares of equal size from the four corners and bending up the sides. What size squares should be cut out to obtain the largest possible volume? What is the largest possible volume?

Example: Corn silos are usually in the shape of a cylinder surmounted by a hemisphere. If the average yield on a given farm requires that the silo contain 1000m^3 of corn, what dimensions of the silo would use the minimum amount of material?