

Math 142 Optimization problems for final exam review

1. An assembly line currently produces 15 units per hour at an average profit per unit of \$40.50. For each addition of one new worker the production increases by 2 units per hour but average profit per unit decreases by \$3. How many new workers should they add to maximize profit? Remember that profit is average profit per unit times number of units.
2. A person has \$900 to spend on a fence. The material for 3 of the sides costs \$4 per foot and the material for the 4th side costs \$12 per foot (for the height he will use). Find the dimensions of the maximum rectangular area he can enclose.
3. A person will build a fence to enclose a rectangular area of 1296 sq. ft. the material for 3 of the sides costs \$4 per foot and for the 4th side the cost is \$12 per foot. Find the dimensions that will minimize the total cost of the fence.
4. A storage box with rectangular base and sides and an open top is to have a volume of 972 cubic feet. The length of the base is twice the width. Find the dimensions that minimize the surface area.