

Problem 1. *A farmer wants to fence an area of 1.5 million square feet in a rectangular field and then divide it in half with a fence parallel to one of the sides of the rectangle. How can he do this so as to minimize the cost of the fence?*

Problem 2. *A box with a square base and an open top must have a volume of $32,000 \text{ cm}^3$. Find the dimensions of the box that minimize the amount of material used.*

Problem 3. *A manufacturer has been selling 1000 TVs a week at \$450 each. A market survey indicates that for each \$10 discount offered to the buyer, the number of TVs sold will increase by 100 per week.*

(a) *Find the demand function. That is, how many TVs are sold at each discount level?*

(b) *How large a discount should the company offer to maximize the revenue?*

(c) *Suppose that each week it costs \$86,000 to run the business, and each TV costs \$150 to make and get to the customer. What discount would maximize the company's profits?*