1. The product of two positive numbers is 675. Minimize the sum of the first and three times the second. What are the numbers?

2. A rancher has 300 feet of fencing to enclose a rectangular pasture bordered on one side by a river. The river side of the pasture needs no fence. Find the dimensions that will produce a pasture with a maximum area.

3. A farmer has 160 feet of fencing to enclose 2 adjacent congruent rectangular pigpens. What dimensions should be used for each pigpen so that the enclosed area will be a maximum?

4. The management of a large store wishes to add a fenced-in rectangular storage yard of 20,000 square feet, using the building as one side of the yard. Find the minimum amount of fencing that must be used to enclose the remaining 3 sides of the yard.

5. An open box is to be made from a square piece of material, 12 inches on each side, by cutting equal squares from each corner and turning up the sides. Find the volume of the largest box that can be made in his manner.

6. A page is to contain 60 square inches of print. The margins at the top and bottom of the page are each 1½ inches wide. The margins on each side are 1 inch. What should be the dimensions of print so that a minimum amount of paper is used?

7. An open box is to be made from a 3-foot by 5-foot rectangular piece of material by cutting equal squares from each corner and turning up the sides. Find the volume of the largest box that can be made in this manner.