

XII Find the length and the width of a rectangle that has perimeter 200 meters and a maximum area

XIII Find the length and the width of a rectangle that has area of 100 sq. ft and a minimum perimeter.

XIV

**Area** A rectangular page is to contain 36 square inches of print. The margins at the top and bottom and on each side are to be  $1\frac{1}{2}$  inches. Find the dimensions of the page that will minimize the amount of paper used.

XV

13. **Maximum Area** A rancher has 200 feet of fencing to enclose two adjacent rectangular corrals (see figure). What dimensions should be used so that the enclosed area will be a maximum?



Figure for 13

XVI

14. **Area** A dairy farmer plans to enclose a rectangular pasture adjacent to a river. To provide enough grass for the herd, the pasture must contain 180,000 square meters. No fencing is required along the river. What dimensions will use the smallest amount of fencing?

XVII

15. **Maximum Volume**  
 (a) Verify that each of the rectangular solids shown in the figure has a surface area of 150 square inches.  
 (b) Find the volume of each solid.  
 (c) Determine the dimensions of a rectangular solid (with a square base) of maximum volume if its surface area is 150 square inches.

XVIII

20. **Minimum Surface Area** A net enclosure for golf practice is open at one end (see figure). The volume of the enclosure is  $83\frac{1}{3}$  cubic meters. Find the dimensions that require the smallest amount of netting.

