

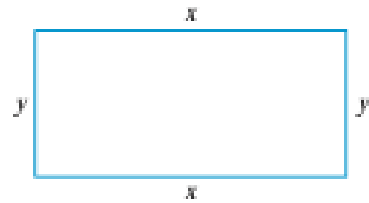
Optimization

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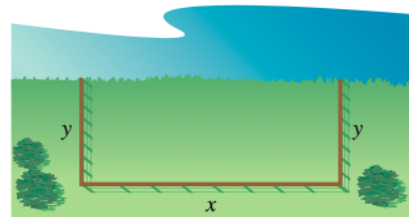
I.

A garden is to be laid out in a rectangular area and protected by a chicken wire fence. What is the largest possible area of the garden if only 100 running feet of chicken wire is available for the fence?



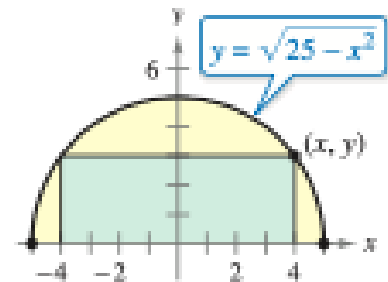
II.

A farmer plans to fence a rectangular pasture adjacent to a river. The pasture must contain 405,000 square meters in order to provide enough grass for the herd. No fencing is needed along the river. What dimensions will require the least amount of fencing?



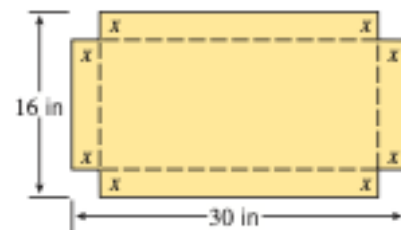
III.

A rectangle is bounded by the x -axis and the semicircle $y = \sqrt{25 - x^2}$. What length and width should the rectangle have so that its area is a maximum?



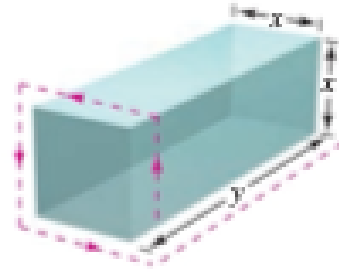
IV.

An open box is to be made from a 16-inch by 30-inch piece of cardboard by cutting out squares of equal size from the four corners and bending up the sides. What size should the squares be to obtain a box with the largest volume?



V.

A rectangular package to be sent by a postal service can have a maximum combined length and girth (perimeter of a cross section) of 108 inches. Find the dimensions of the package of maximum volume that can be sent. (Assume the cross section is square.)



VI.

The person in the rowboat shown in the figure below can row 3 mi/h and walk 5 mi/h . To what point on shore should they row in order to minimize the total time of travel?

