Optimization Review Questions.

1. Find two positive numbers in which the second number is the reciprocal of the first and their sum is a minimum.

2. Find the length and width of a rectangle that has an area of 64 square feet and has a minimum perimeter.

3. A farmer has 200 feet with which to enclose two adjacent rectangular corrals (they share one side). What dimensions should be used for each corral so that together the enclosed area will by a maximum?

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

5. An open box is to be made from a rectangular piece of material (2ft by 3ft) by cutting equal squares from each corner and turning up the sides. Find the dimensions of the box of maximum volume.

Answers

1. 1 and 1
2. 8ft by 8ft
3. 25 by 100/3 feet
4. 18 by 18 by 36 inches
5. $\frac{5-\sqrt{7}}{6}$ by $\frac{1+\sqrt{7}}{3}$ by $\frac{4+\sqrt{7}}{3}$ feet