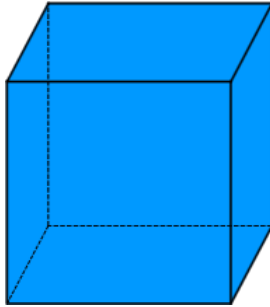


## 4.4 Optimization

A manufacturer wants to design an open box having a square base and a surface area of 108 sq. in. What dimensions will produce a box with maximum volume?



Oct 19-7:32 AM

**Understand the problem:** Identify all given quantities and quantities to be determined. If possible, make a sketch.

**Write a Primary Equation** to model the problem - represents the quantity to maximize or minimize.

Determine the **feasible domain** of the primary equation. Graphing is usually helpful!

**Reduce** the primary equation to **1 independent variable**. (may involve the use of secondary equations)

Determine the desired **max or min** using calculus.

Find the critical points and endpts.

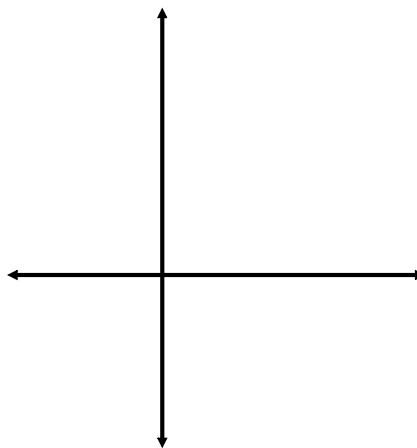
Use the 1st or 2nd derivative test to identify max or min points.

**Answer the original question.**

Oct 19-7:33 AM

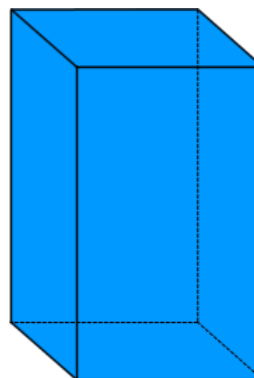
A rectangle is bounded by  $x$  &  $y$  axes and the graph of  $y = \frac{6-x}{2}$

What are the dimensions that maximize the area of the rectangle?



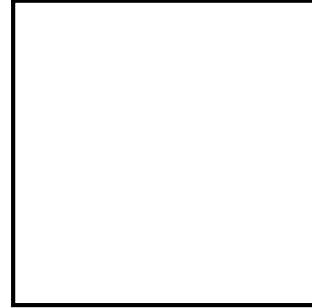
Oct 19-7:40 AM

Determine the dimensions of a rectangular solid with a square base and surface area of 337.5 sq. cm. that maximize the volume.



Oct 19-7:41 AM

An open top box is to be created by cutting squares from the corners of a 24" square piece of paper and bending up the sides. Determine the dimensions of the box with a maximum volume.



Oct 19-7:42 AM

What is the largest rectangular garden that can be enclosed with 600 feet of fence?

Oct 15-10:40 PM