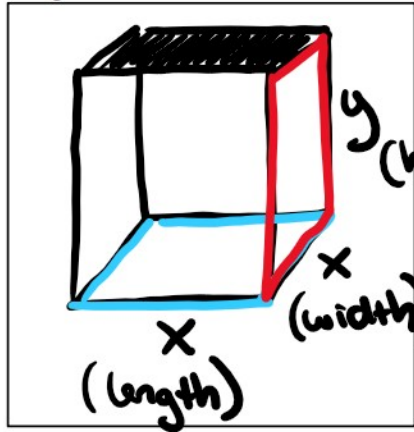


Rectangular Box Notes

Wednesday, June 12, 2019 7:14 AM

A company wants to make an open box having a square base and a surface area of 300 square feet. Find the dimensions of the box with the greatest volume. Find the volume.

Diagram:



Equation A:
(given info)

SA BASE 4 SIDES
 $300 = x^2 + 4xy$

Equation A:
(new version)

$y = \frac{300 - x^2}{4x}$

Equation B:
(max/min)

$V = l \cdot w \cdot h$
 $V = x \cdot x \cdot y$
 $V = x^2 y$

Equation B:
(new version)

$V = 75x - \frac{1}{4}x^3$

Equation B:
(1st derivative)

$V' = 75 - \frac{3}{4}x^2 = 0$

$\frac{4}{3} \cdot 75 = \frac{3}{4}x^2 \cdot \frac{4}{3}$
 $\pm \sqrt{100} = \sqrt{x^2}$
 $x = \pm 10$

Length: 10 Width: 10
SAME

Height: 5 Volume: 500
 $\frac{1}{2}$ length/width