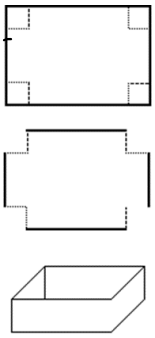
8.1 Box Problem – Maximizing Volume Notes

In your own words describe how we are going to take a flat piece of cardboard and turn it into a box with an open top.



Feb 7-7:25 AM

1. A square of side x inches is cut out of each corner of a 25 in. by 15 in. piece of cardboard, and the sides are folded up to form an open-topped box.

a. Draw a model to demonstrate this problem.

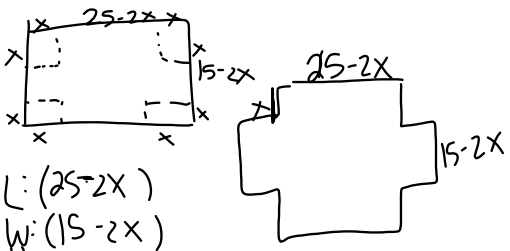
b. Write a function for the volume of the box.

c. State the domain.

d. Use your graphing calculator to determine the dimensions that will produce the box of maximum volume then, state the dimensions of the box.

Length =
Width =
Height =
Maximum Volume =

Feb 7-7:28 AM



L: (25-2x)
W: (15-2x)
H: x

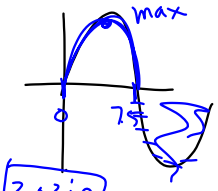
Feb 15-8:45 AM

b) $V(x) = (25-2x)(15-2x)x$

c) $(0, 7.5)$ start at 0 $\frac{1}{2}$ of the smallest side

Feb 15-8:48 AM

d)



X: 3.03
Y: 513.05

Height: 3.03 in
Length: 25 - 2(3.03): 18.94 in
Width: 15 - 2(3.03): 8.94 in
Volume: 513.05 in^3

Feb 15-8:49 AM

2. A square of side x inches is cut out of each corner of a 13 in. by 7 in. piece of cardboard, and the sides are folded up to form an open-topped box.

a. Draw a model to demonstrate this problem.

b. Write a function for the volume of the box.

c. State the domain.

d. Use your graphing calculator to determine the dimensions that will produce the box of maximum volume then, state the dimensions of the box.

Length =
Width =
Height =
Maximum Volume =

Feb 7-7:29 AM