

## Day 5: Modeling Real Situations Using Cubic Functions

Investigation - Groups of 2

Grab: Scissors, paper, rulers and tape.

Smallest

276.75

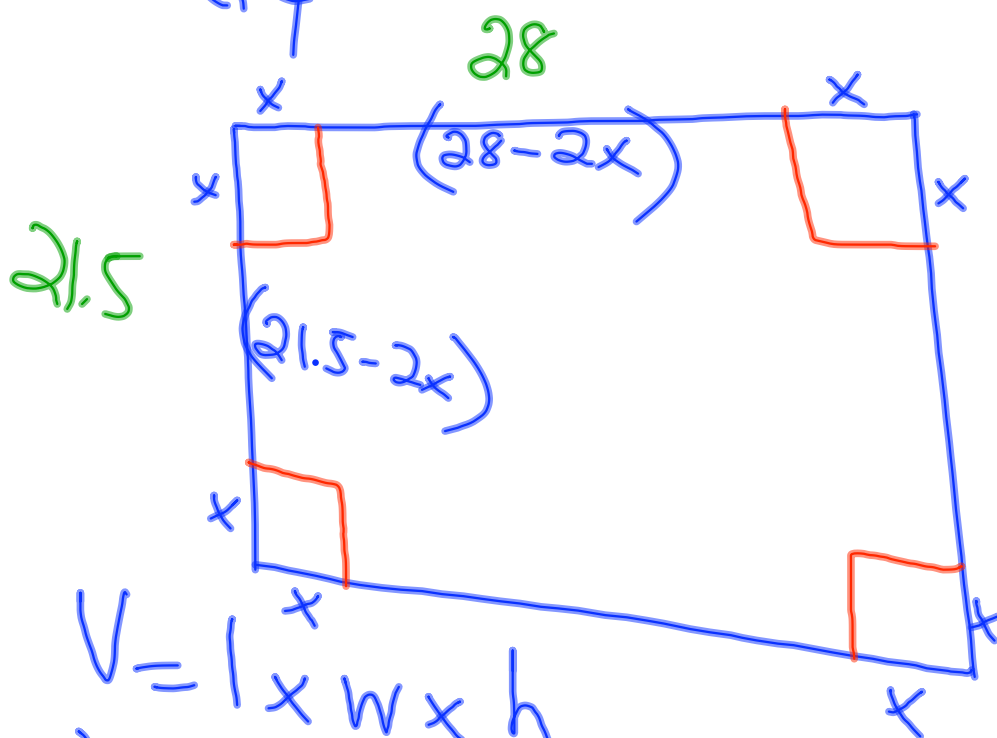
39.375

59.214

Largest

$\sqrt[3]{1080}$

1797



$$V = l \times w \times h$$

$$V = (28-2x)(21.5-2x)x$$

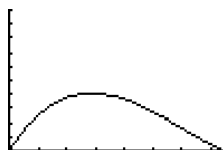
Example:

A piece of cardboard 15cm, long and 21cm wide is used to make an open box.

a) Write the volume  $V$  of the box as a function of the side length,  $x$  centimetres, of each square cutout.

$$V = (15 - 2x)(21 - 2x)x$$

b) Graph  $V$  against  $x$  for values of  $x$  between 0 and 7.5. Why should we use a domain of 0 to 7.5?



c) What size of square should be cut out from the corners to have a box with volume 350cm<sup>3</sup>? What are the dimensions of the box?

$$x = 1.73 \text{ cm}$$

$$x = 4.19 \text{ cm}$$

Dimensions

$$\begin{array}{l} 15 - 2x \\ 15 - 2(1.73) = \underline{11.54 \text{ cm}} \end{array}$$

$$\begin{array}{l} 21 - 2x \\ 21 - 2(1.73) = \underline{17.54 \text{ cm}} \end{array}$$

Assignment:  
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