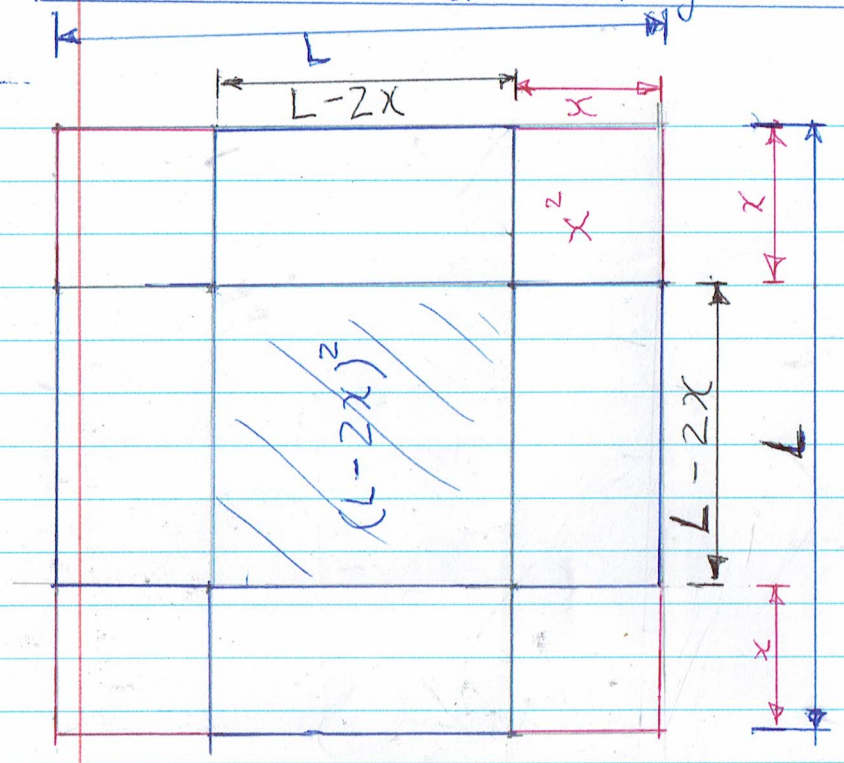
Cuboid Challenge



$V = (L-2x)^2 \times x$ Note: for a given L, $x < \frac{L}{2}$ & $x > 0$

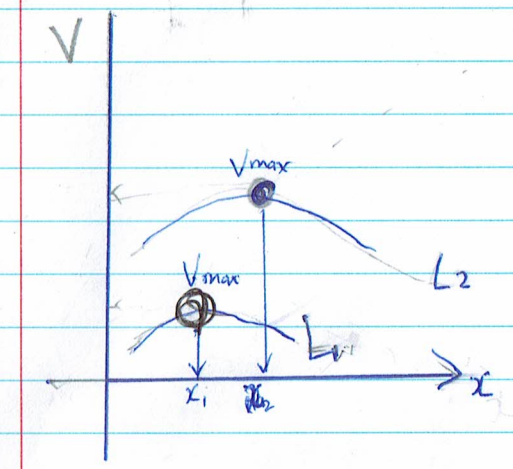
vary L

L_5	L_4	L_3	L_2	L_1	x	x^2	$V=(L-2x)^2 \times x$
					vary x		

Set up Excel Table as shown

Plot graph for V vs. x
Refer to excel

Discussion



① For a given L, there's only 1 x where V is at the largest

L	x	V_{max}
20	~~3.2~~	~~588~~
30	5	2000
40	7	4732
50	8	9248
60	10	16000

(More precise measurement: 592.548)

② (a) The size of paper is L^2 and the volume is V_{max}. So I plotted V_{max} vs. L^2 The trend is increasing.

(b) $4x^2$ is the area of paper cut. There is a non-linear increasing trend. V_{max} vs. x^2

(c) The graph of L^2 vs. x^2 is increasing non-linearly.

If a 3d plot were possible, all three graphs would be combined to get a better understanding.

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