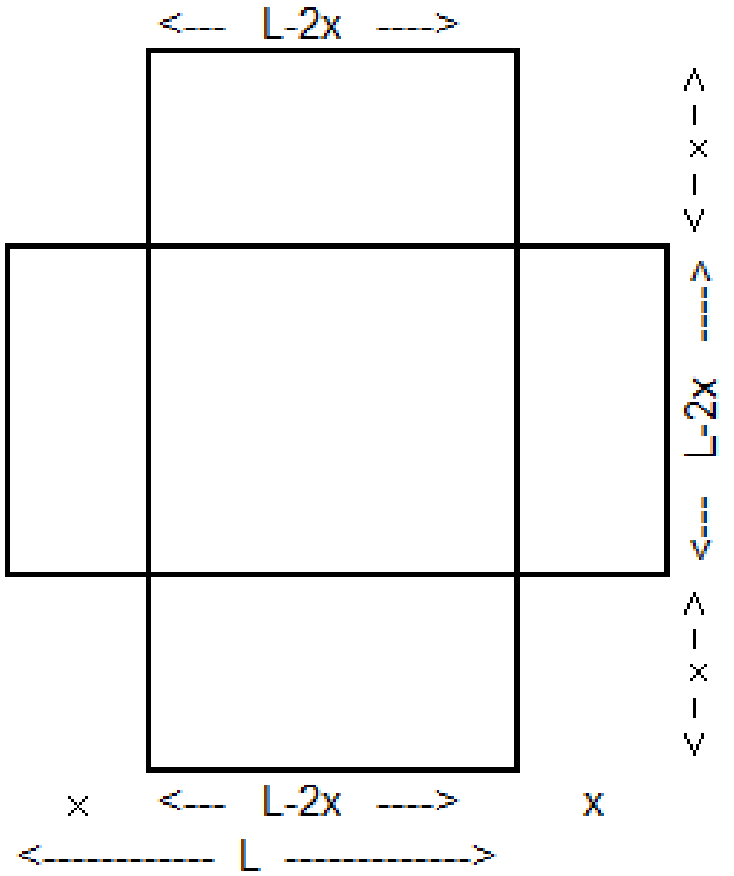
A quick note on business calculus

“Maximum volume of box“

What dimensions should be used to create a box with maximum volume using a square piece of paper with a side length L ?



volume y=((L-2x)(L-2x)x= $4x^3 - 4Lx^2+L^2x$ If we differentiate this,

y'= $12x^2 - 8Lx+L^2$

x= $\frac{2L \pm L}{6}$ = $\frac{1}{2}$L , $\frac{1}{6}$L $\frac{1}{2}L$ is not acceptable.

× = $\frac{1}{6}L$ The height(x) of the box is 1/6 of the sidw(L), at which point the volume is maximum.

If we assume L=120 cm and verify,

X=120/6=20cm、 maximum volume＝20＊(120-20*2)*(120-20*2)=128,000 cm^3

x	volume
14	118,496
16	123,904
18	127,008
20	128,000
22	127,072
24	124,416
26	120,224