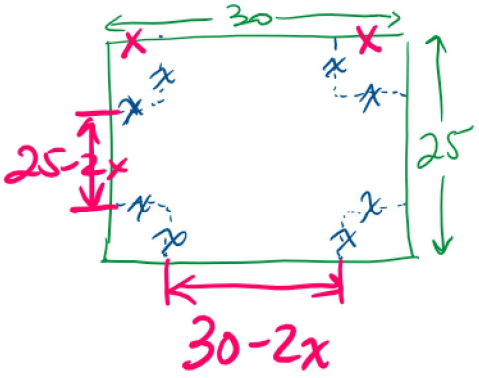
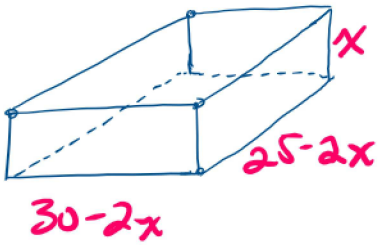
ex. 1 A piece of cardboard is 30cm x 25cm. It is used to make a box with no lid. The corners are cut by equal squares of side length x cm and the sides are folded.





a) Write a polynomial function to represent volume.

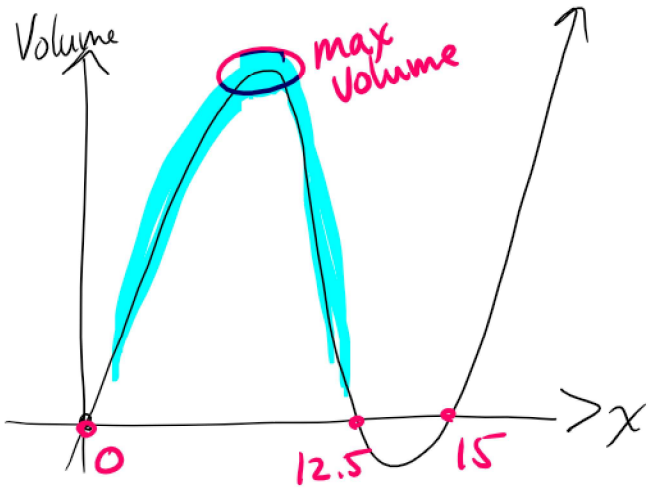
$V = lwh$

$V = x(30-2x)(25-2x)$ FACTORED FORM

cubic
pos. L.C. ↗
x int → 0, 15, 12.5

b) graph

range	xmin	-2
	xmax	22
	xscl	0.25
	ymin	-40
	ymax	1000
	yscl	20



dimensions of the box — POSITIVE ONLY

$30-2x=0$

$x=15$

$25-2x=0$

$x=12.5$

$15(\underbrace{30-2(15)}_{0})(\underbrace{25-2(15)}_{\text{negative}})$

$12.5(30-2(12.5)\overset{+}{)}(\underbrace{25-2(12.5)}_{0})$

SIDE LENGTH may not be more than 12.5 cm
" " " less than 0 cm

↓

domain $x \longrightarrow 0 < x < 12.5$

max. volume $\longrightarrow$ approx 151 cm^3

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ex.2 Himika and 3 friends were born on the same day but different years. Martin is 5 years younger than Himika. Sk is 2 years younger than Himika. Chloe is 3 years older than Himika

Himika = H Martin = H-5 Sk = H-2 Chloe = H+3

On their last birthday, the product of their ages was 61,136 greater than the sum of their ages.

$$\underbrace{H(H-5)(H-2)(H+3)}_{\text{product}} = \underbrace{H+(H-5)+(H-2)+(H+3)}_{\text{sum}} + 61{,}136$$

$$H(H-5)(H-2)(H+3) = 4H + 61{,}132$$

$H(H-5)(H-2)(H+3) = 4H + 61132$

$H(H-5)(H-2)(H+3) - 4H - 61132 = 0$

$x\min = -30$
$x\max = 30$
$x\text{scl} = 5$

$y\min = -70000$
$y\max = 60000$
$y\text{scl} = 10000$

χint ⊛ → is Himiha's age = 17, M = 12
SK = 15
Ch = 19

p58 # 3-5, 11, 12