1. First, Check your HW using the solutions

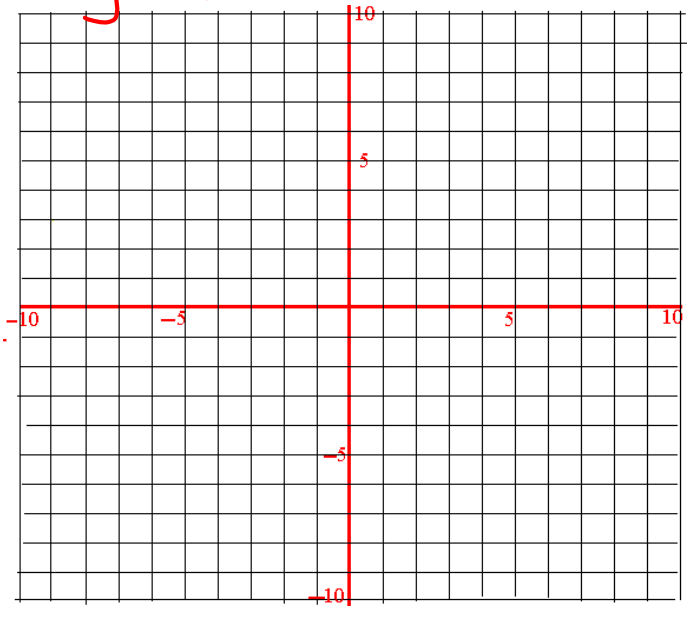
   If questions still linger, use the HW Tally

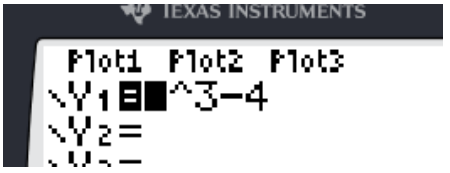
2. Then, Pick up the Warm Up

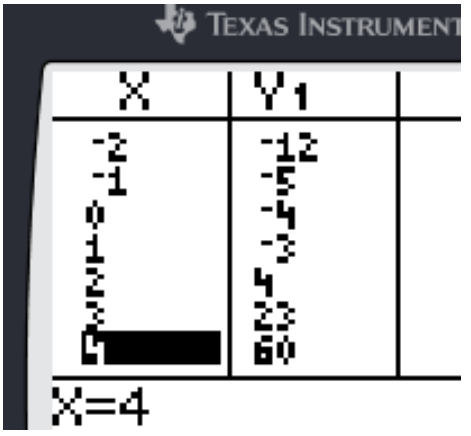
59 $h(x) = x^3 - 4$

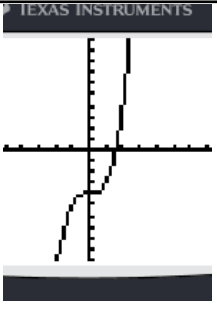
x	y
0	-4
1	-3
-3	-31
-2	-12

$y = x^3 - 4$









domain: $\mathbb{R}$

range: $\mathbb{R}$

y-int: $(0,-4)$

x-int: $y = x^3 - 4$

$0 = x^3 - 4$

$\sqrt[3]{\ }\ \sqrt[3]{\ }$

$4 = x^3$

$\sqrt[3]{4} = x$

$x \approx 1.59$

y

x

(x,0)

(0,-4)

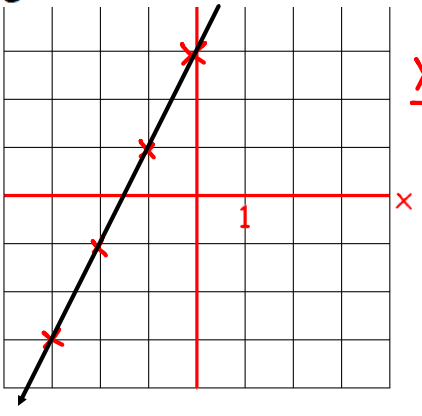
Questions on HW ?

1-66

1-66. Graph the following functions and find the x- and y-intercepts.

a. $y = 2x + 3$

b. $f(x) = 2x + 3$



x-intercept

$(-1.5, 0)$

y-int

$(0, 3)$

c. How are the functions in (a) and (b) the same? How are they different?

same function and graph. just different notation.

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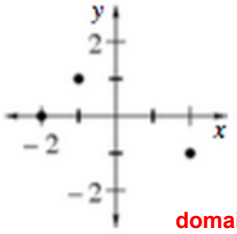
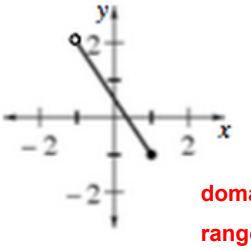
a.



domain $-2, -1, 2$

range $-1, 0, 1$

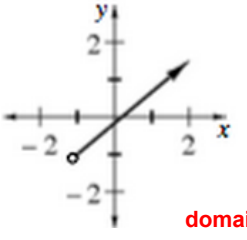
b.



domain $-1 < x \leq 1$

range $-1 < y \leq 2$

c.



domain $x > -1$

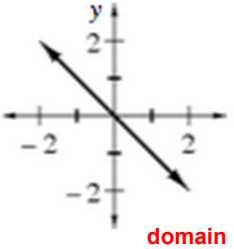
range $y > -1$

Another alternative to indicate x is greater than -1

$-1 < x < \infty$

$-1 \leq y < \infty$

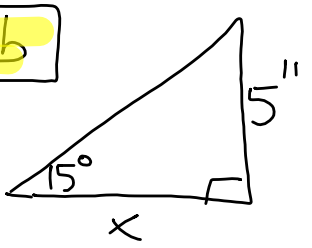
d.



domain $\mathbb{R}$

range $\mathbb{R}$

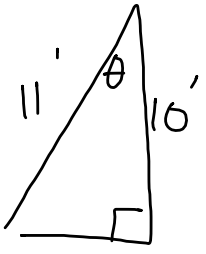
60 b



$$\tan 15^\circ = \frac{5}{x}$$

$$x = \frac{5}{\tan 15^\circ}$$

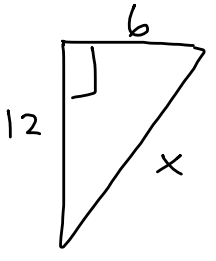
60 c



$$\cos\theta = \frac{10}{11}$$

$$\theta = \cos^{-1}\left(\frac{10}{11}\right)$$

60 d



$$a^2 + b^2 = c^2$$

65

$f(x) = \frac{1}{x-2}$

(a) $f(2.5) =$

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WARM UP

Warm Up

1.2.1_Day 2

Multiply the following polynomial factors:

a monomial times a binomial

$x(x-7)$ $x^2 - 7x$

a monomial times a binomial

$2y^2(5y+4)$

$10y^3 + 8y^2$

a binomial times a binomial

$(z + 2)(10z - 1)$

$10z^2 - z + 20z - 2$

$10z^2 + 19z - 2$

$(z+2)(10z-1)$

$-z + 20z + 10z^2 - 2$

a monomial times a binomial times a binomial

$3x(x - 1)(2 - x)$

$(3x^2 - 3x)(2 - x)$

$6x^2 - 3x^3 - 6x + 3x^2$

$-3x^3 + 9x^2 - 6x$

$3x(x - 1)(2 - x)$

$3x(2x - x^2 - 2 + x)$

$3x(-x^2 + 3x - 2)$

$-3x^3 + 9x^2 - 6x$

⑤ One has to be careful when factoring quadratic trinomials into two binomials when there is a common factor. In fact, the box method doesn't quite work the same if you do not factor out the greatest common factor first.

Factor: $12x^2 + 22x + 6$

$2(6x^2+11x+3)$

$=2(2x+3)(3x+1)$

	2x	3
3x	$6x^2$	9x
1	2x	3

$18x^2$

$11x$

$(3x+1)(4x+6)$

⑤ One has to be careful when factoring quadratic trinomials into two binomials when there is a common factor. In fact, the box method doesn't quite work the same if you do not factor out the greatest common factor first.

Factor: $12x^2 + 22x + 6$

$2(6x^2+11x+3)$

$=2(\quad X \quad)$

$6x^2$	
	3

$18x^2$

$11x$

1x 18x
2x 9x
3x 6x

⑤ One has to be careful when factoring quadratic trinomials into two binomials when there is a common factor. In fact, the box method doesn't quite work the same if you do not factor out the greatest common factor first.

Factor: $12x^2 + 22x + 6$

$2(6x^2+11x+3)$

- $= 2(2x+3)(3x+1)$

	2x	3
3x	$6x^2$	9x
1	2x	3

$18x^2$: $1x + 18x$ → $2x \cdot 9x$ → $3x \cdot 6x$; $11x$

⑥ Hopefully you have already either written or pasted into your Algebra log, the Quadratic Formula. Use it to solve the following quadratic equation.

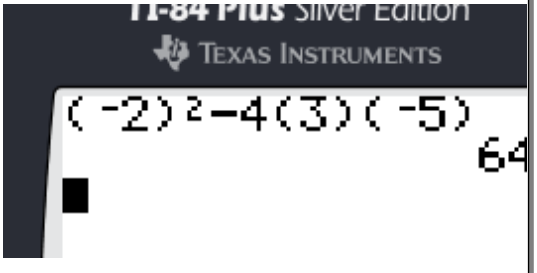
$3x^2 - 2x - 5 = 0$

$a = 3 \quad b = -2 \quad c = -5$

$$X = \frac{-(-2) \pm \sqrt{(-2)^2 - 4(3)(-5)}}{2(3)} = \frac{-(-2) \pm \sqrt{(-2)^2 - 4(3)(-5)}}{2(3)}$$

$$X = \frac{2 \pm \sqrt{64}}{6} = \frac{2 \pm 8}{6}$$

$$X = \begin{cases} \frac{2+8}{6} = \frac{10}{6} = \frac{5}{3} \\ \frac{2-8}{6} = \frac{-6}{6} = -1 \end{cases}$$



-5^2

-25

$(-5)^2$

25

$-2x^2+7x-7$

$x=-5$

(5) $3x^2 - 2x - 5 = 0$ $a=3$ $b=-2$ $c=-5$

$$x=\frac{-(-2)\pm\sqrt{(-2)^2-4(3)(-5)}}{2(3)}=\frac{2\pm\sqrt{64}}{6}=\frac{2\pm8}{6}$$

$\therefore x=\frac{2+8}{6}$ and $x=\frac{2-8}{6}$

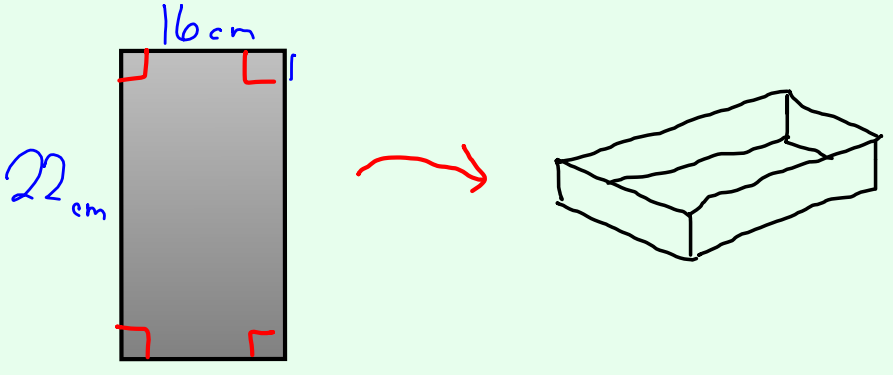
$=\frac{10}{6}$ $x=\frac{-6}{6}$

$=\frac{5}{3}$ $=-1$

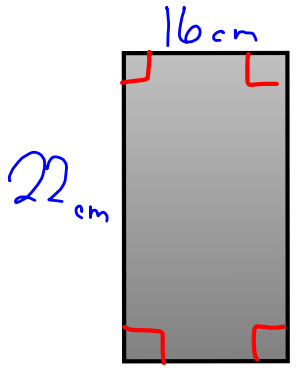
Started Yesterday : The Box Problem

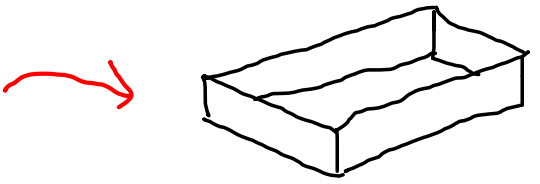
Aim: To create a function that models a geometric situation.

Designing an open top box, starting from a flat rectangular piece of metal.



What should the <u>height</u> of the finished box be in order to maximize the volume ????





What is the largest cutout size possible?

Therefore, the largest possible height is 8 cm

Cut Out Length (cm) x	Volume (cm^3) y
0	0
1	280
2	432
3	480
4	448
5	360
6	240
7	112
8	0

16

What would be the volume?

Cut Out Length (cm) x	Volume (cm^3) y
0	0
1	280
2	432
3	480
4	448
5	360
6	240
7	112
8	0

Cut Out Length (cm) x	Volume (cm^3) y
0	0
1	280
2	432
3	480
4	448
5	360
6	240
7	112
8	0

So what would the graph of the

Volume of the box

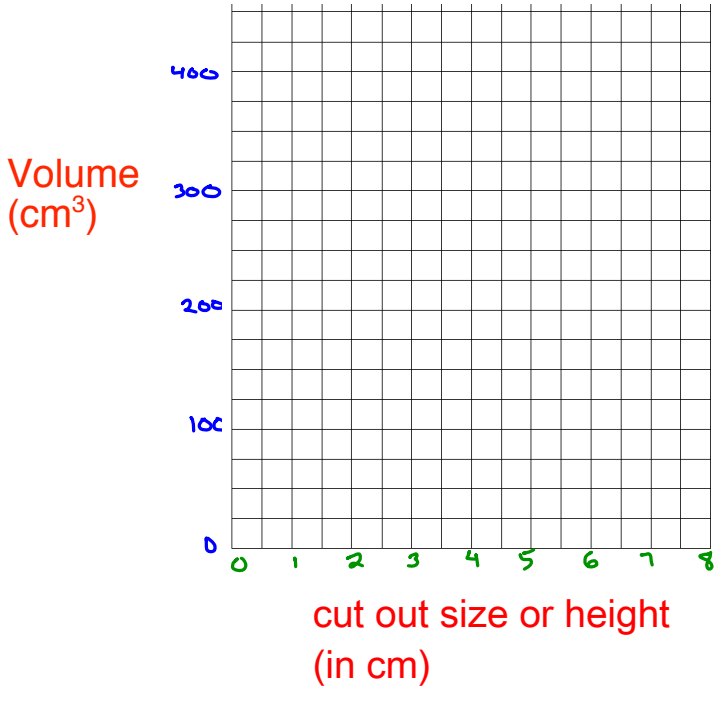
VS

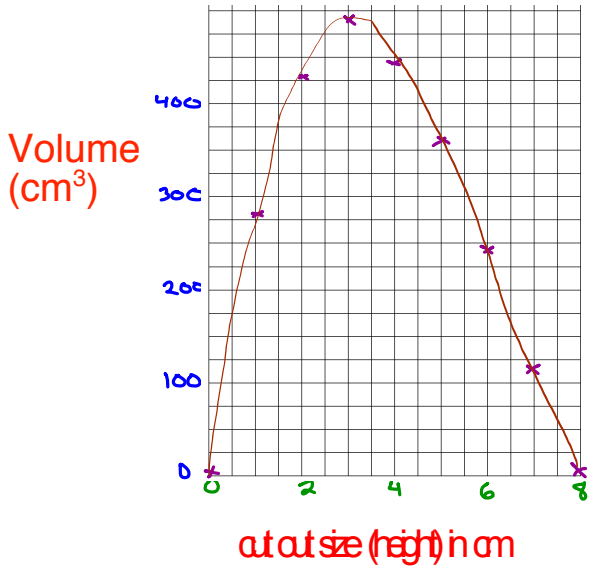
Cut out size

look like ?

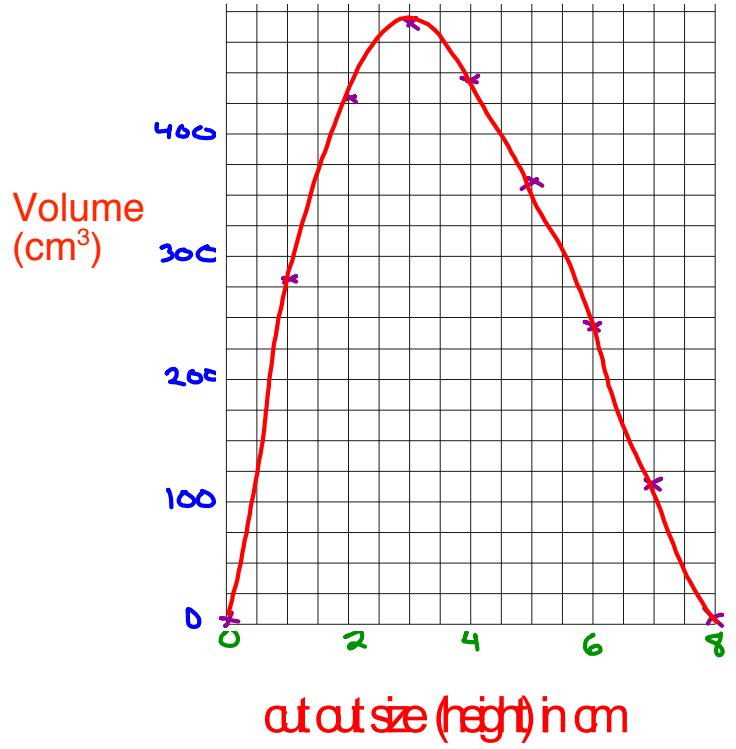
Next step:

Next to your table, set up a graph and plot the points

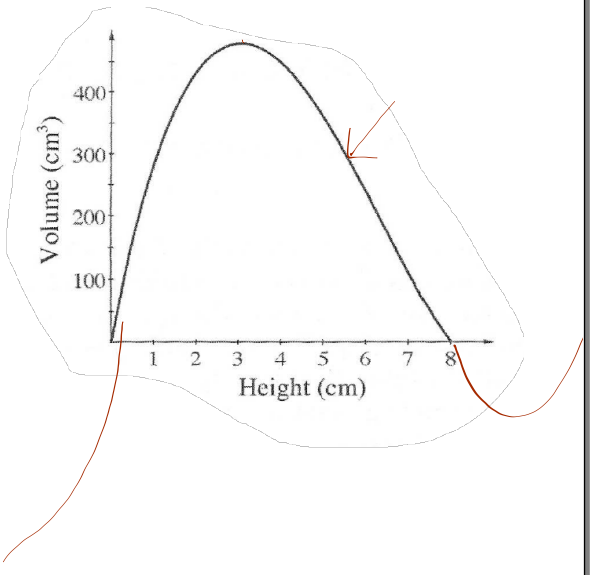




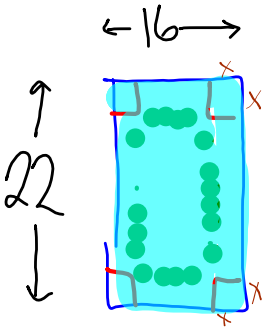
Does it make sense to make the graph continuous?

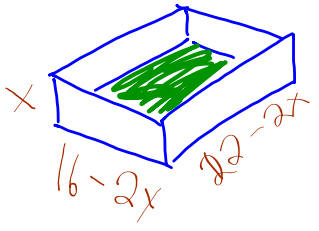


here is what part of the graph of the volume function actually looks like.

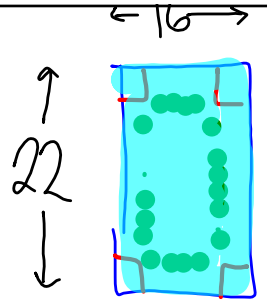


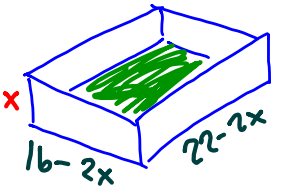
Add the three dimensions to the box





Volume Function $V(x) = x(22-2x)(16-2x)$

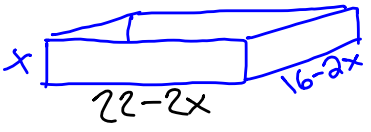


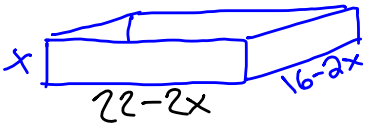


height • width • length

$V(x) =$

With your partner or group, caculate an expression for the VOLUME.





$V = x(22-2x)(16-2x)$

$= x[4x^2 - 76x + 352]$

$= 4x^3 - 76x^2 + 352x$

or

$V = x(22-2x)(16-2x)$

$= (22x - 2x^2)(16-2x)$

$= 352x - 44x^2 + 32x^2 + 4x^3$

$= 4x^3 - 76x^2 + 352x$

Graph using the GDC

max volume is $480.1\ cm^3$
when cut out size 3.05 cm

B.B.

All Pencils & Pens down

Mid -Chapter HW Check

- Put your HW done so far in order
- Staple your recording sheet on top.
-

We learn from mistakes.

So, mistakes on homework and small LCQ's are not a bad thing as long as...

In a moment, I'll give each group a copy of the solutions.

No cell phones out

If you have not taken it, let me know now.

Assignment: 1...67, 70-72, 74b, 75-76

The First Test will be:

Thur, Dec. 20