PICK UP THE WARM UP

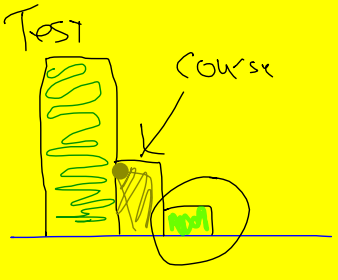
DO THE FRONT SIDE ONLY

HW Help

Yesterday there was an "Exit Ticket".
If absent, you will be excused from it provided your absence has been excused.

If you were absent last class :

You already checked my blog so you know that we had an Exit Ticket the last class.



Pick Up the Warm Up

HW Help →

(1) Show how to find the x- and y-axis intercepts algebraically.
When done you can check with your calculator.

y-int

set $x=0$

$y=(0)^5-18$

$=-18$

$(0,-18)$

x-int

set $y=0$

$0=x^5-18$

$x^5=18$

$\sqrt[5]{\quad}\quad\sqrt[5]{\quad}$

$y=x^5-18$

$x=\sqrt[5]{18}$

$(\sqrt[5]{18},0)$

$(1.78,0)$

(3) Show how to find the y-axis intercept AND x-axis intercept(s) algebraically of the following function. when you are done, you can check with your calculator.

$$y = x^5 - 18$$

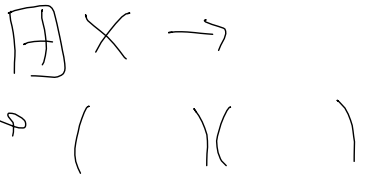
2

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

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

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



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

$2(\quad)$

$= 2(\quad X \quad)$

Factor: $12x^2 + 22x + 6 = (\quad)(\quad)$ ← goal

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

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

-

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

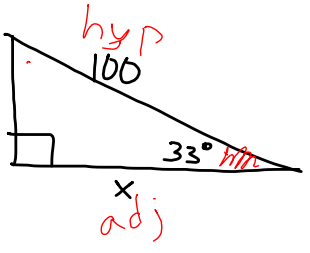
$18x^2$ / $11x$

$18x^2$ / $11x$ → 2x, 9x

$1x + 18x$ → 2x, 9x; 3x, 6x

Use ~~SOH~~-~~CAH~~-~~TOA~~ to solve for missing lengths.

(4)

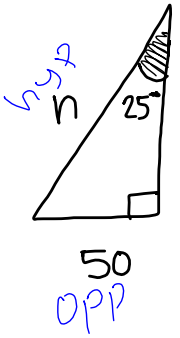


$\cos(33) = \frac{x}{100}$

$x = 100 \cdot \cos(33)$

83.87

(5)



$n \cdot \sin(25) = \frac{50}{n}$

$n \cdot \sin(25) = 50$

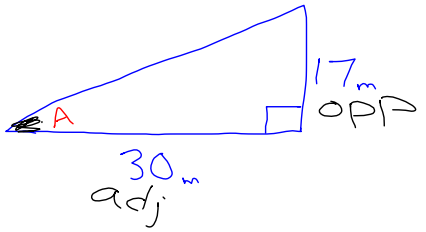
$n = \frac{50}{\sin(25)}$

$$\frac{\sin(25)}{1} = \frac{50}{n}$$

$$\frac{n}{1} = \frac{50}{\sin(25)}$$

$$n = 118.31$$

(6)



find angle A

Soh Can Toa

$$\tan(A) = \frac{17}{30}$$

$$A = \tan^{-1}\left(\frac{17}{30}\right)$$

$$= 29.54^{\circ}$$

HW
?

S1 $4.1x = 9.5x + 23.7$

$-4.1x \quad -4.1x$

$5.4x = 23.7$

$0 = 5.4x + 23.7$

52b $\frac{5}{15}\left(\frac{1}{5}\right)x - 2(x) = \frac{25}{25}\left(\frac{13}{25}\right) - (0.7x)25$

$5x - 50 = 13 - 17.5x$

48a) $x^2 - 8x + 15 = 0$

b) $2x^2 - 5x - 6 = 0$

$a = 2$

$b = -5$

$c = -6$

$\frac{1}{5}x - 2 = \frac{13}{25} - \frac{7}{10}x$

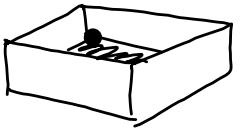
Goals and tomorrow

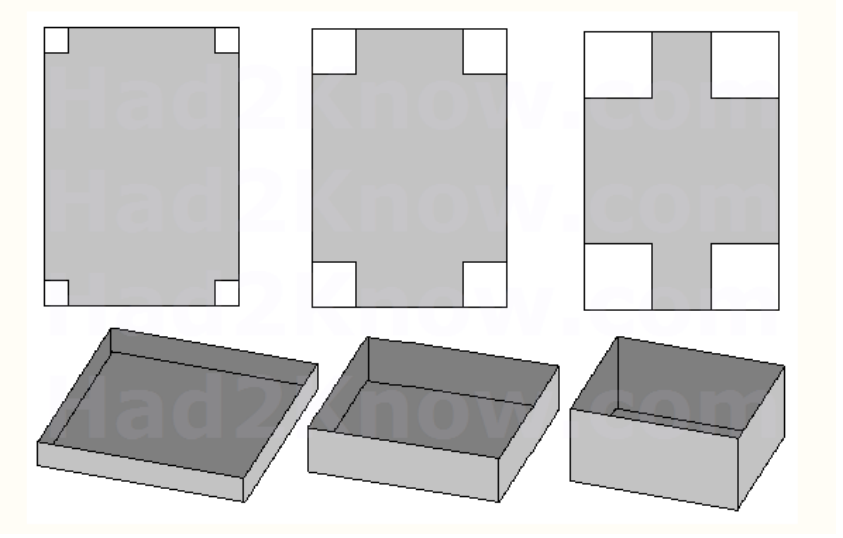
Optimize the design of an Open Top Box

(2 day investigation)

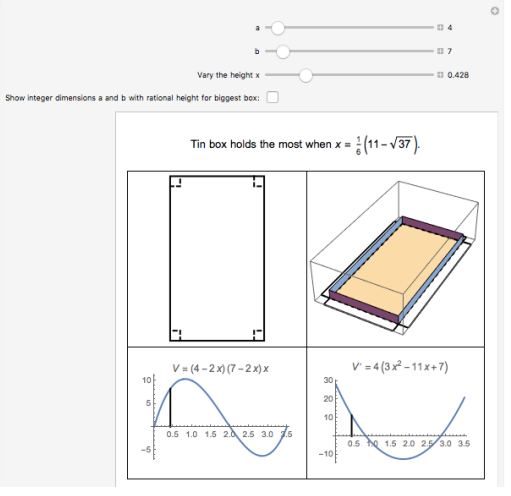
Maximize the
Volume of a Box

Demo of an Open Top Box being constructed

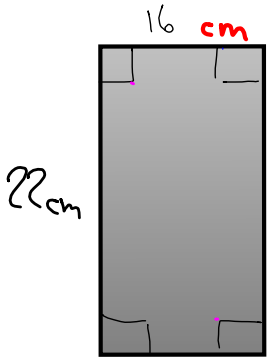


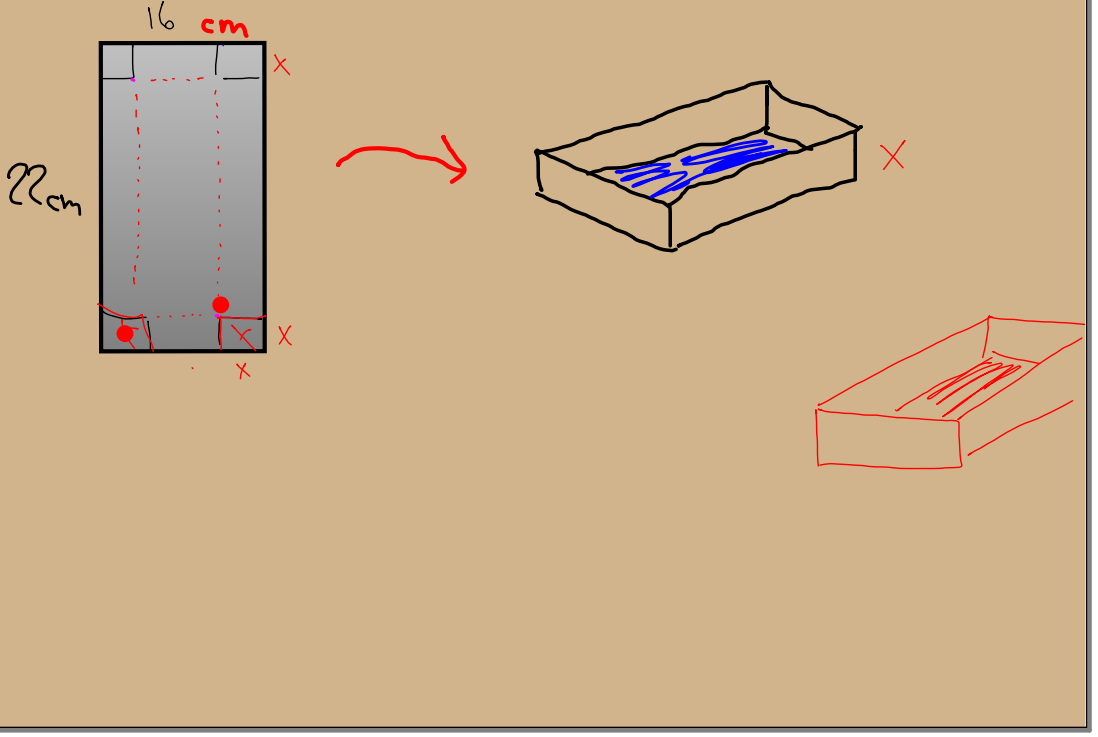


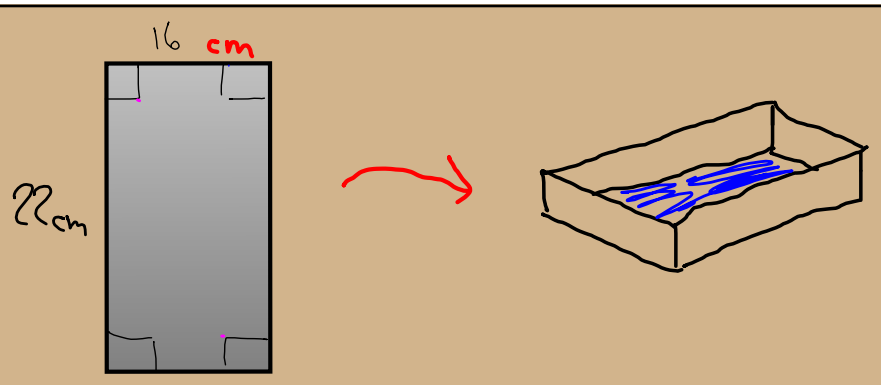
Tin Box with Maximum Volume



NOTES Start from a flat rectangular piece of metal.







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

Each pair will be given a paper with dimensions

22cm × 16 cm

Each group will cut out and make a box, however, ever gone will have a different cut out size

1, 2, 3, 4, 5, 6, 7, 8

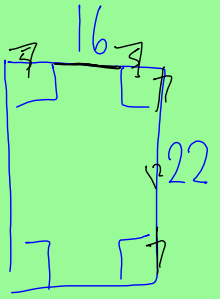
A) Cut, fold, tape your box

B) Which one will give us the largest volume?

Each person should now calculate the volume of their own.

Purple	1×1	squares cut out
~~White~~ Green	2×2	
Cream	3×3	
Blue	4×4	
Brown	5×5	
Light Pink	6×6	
~~Dark Pink~~ Orange	7×7	

cut out (cm)	Volume (cm^3)
0	
1	280 ✓
2	432 ✓
3	480
4	448 cm^3 ✓
5	360
6	240 ✓
7	~~98~~ 112 ~~126~~
8	



22 x 16 x 7

cut out (cm)	Volume (cm^3)
0	0
1	280
2	432
3	480 ✓
4	448
5	360
6	240 ✓
7	112
8	0

Per 2

BB

Review
Trig

non-right triangles

Soh Cah Toa

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

Use if given:

Law of Sines — AAS ASA

Law of Cosines — SAS SSS

Print First/Last Name _____ Per ___

Alg 1 / Geometry --- Reference Sheet for Algebra 2 Foundations

Geometry

in right triangles: Can use both the Pythagorean Theorem $a^2 + b^2 = c^2$ if only dealing with sides

or Soh-Cah-Toa $sine\ A = \frac{opposite}{hypotenuse}$, $cosine\ A = \frac{adjacent}{hypotenuse}$, $tangent\ A = \frac{opposite}{hypotenuse}$

AAS

ASA ~~SSA~~

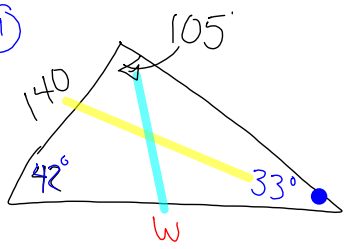
Any right triangle: Law of Sines $\frac{\sin A}{a} = \frac{\sin B}{b}$ where a is the side length opposite angle A, etc.

Law of Cosines $c^2 = a^2 + b^2 - 2ab \cdot cos\ C$ where c is the side length opposite angle C

SAS SSS

ght triangle: Law of Sines $\frac{\sin A}{a} = \frac{\sin B}{b}$ where a is the si

Law of Cosines $c^2 = a^2 + b^2 - 2ab \cdot \cos C$ where

① 

S A A → Law of Sines

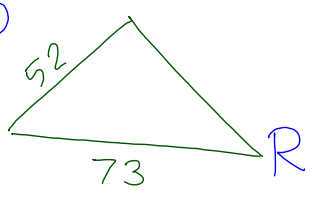
$$\frac{\sin A}{a} = \frac{\sin B}{b}$$

$$\frac{\sin(33^\circ)}{140} = \frac{\sin(105^\circ)}{W}$$

$W = 248.29$

$$\frac{W}{140} = \frac{\sin(105^\circ)}{\sin(33^\circ)}$$

$$W = \frac{140 \cdot \sin(105^\circ)}{\sin(33^\circ)}$$

② 

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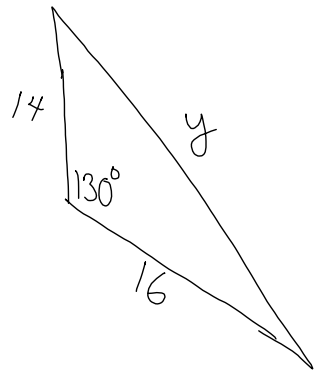


Assignment

1 ... 60ac, 61, 64-65, 69

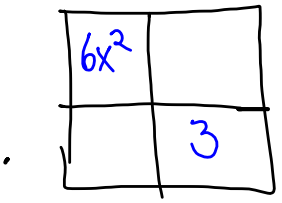
61 (Make a graph on graph paper !!!)

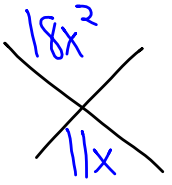
One has to be careful when factoring quadratic trinomials into two binomials **when there is a common factor.** In fact, the box method doesn't quite work the same if you do not factor out the greatest common factor first.

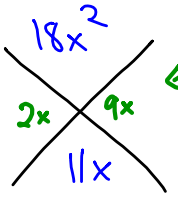
Factor: $12x^2 + 22x + 6 = (\quad)(\quad)$ ← the goal

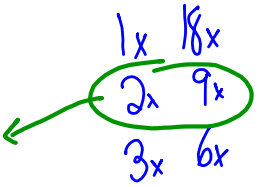
$2(6x^2+11x+3)$

$= 2(\quad)(\quad)$





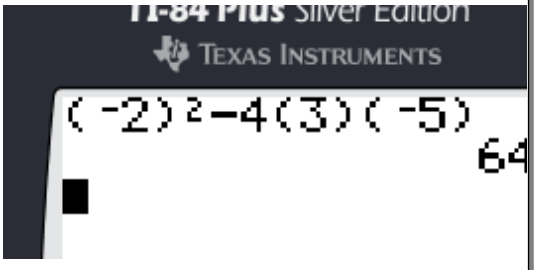




(5) Hopefully you have already either written or pasted into your Algebra log, the Quadratic Formula. Use it to solve the following quadratic equation.

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

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



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

$$x = \frac{-(-2) \pm \sqrt{(-2)^2 - 4(3)(-5)}}{2(3)} = \frac{2 \pm \sqrt{64}}{6} = \frac{2 \pm 8}{6}$$

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

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

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