

# Cornell Notes

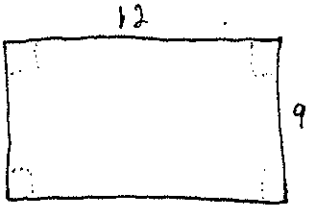
Name: Christen Teacher: Bonn

Date: 12-15-11

Topic: Volume of a Box

Class/Subject: Algebra II Per 1

7:50 Worksheet #1



8:10 Grading Rubric Worksheet #2

8:40

## Maximizing the Volume of a Box

Measurements:

$$l = 12 - 2x$$

$$w = 9 - 2x$$

$$h = x$$

$$V = lwh$$

- You must have 3 sets of correct dimensions before you begin cutting.
- Refer to the grading rubric!

• Your three boxes are due tomorrow in class.

Summary: Your homework today is a take home Quiz. It is due tomorrow. is your ticket in the door. See Mrs. Bonn if you did not receive one.

# Cornell Notes

Name *Christen*

Date

Topic

Class/  
Subject

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# Maximizing the Volume of a Box

Names: \_\_\_\_\_

Date: \_\_\_\_\_

Period: \_\_\_\_\_

Algebra 2

## BACKGROUND:

You will design a box from the cardboard you are given. You may use the following solids: Rectangular prism or a Square Prism ONLY. Your goal is to make a box with as large a volume as possible. Your teacher will fill your largest container with candies.

## RULES:

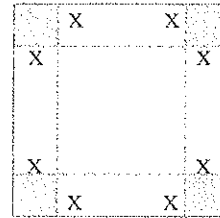
- You may only use one sheet of cardboard per box.
- The box must be secured with tape around all edges.
- The net of the box must be connected. (If you have forgotten what a net is, you will have to ask someone or look it up)

## BEFORE YOU CUT ANYTHING:

☞ Decide on 3 different sized boxes to make. Don't make them. Write their dimensions here:

- 1<sup>st</sup> box: L= \_\_\_\_\_, W= \_\_\_\_\_, H= \_\_\_\_\_
- 2<sup>nd</sup> box: L= \_\_\_\_\_, W= \_\_\_\_\_, H= \_\_\_\_\_
- 3<sup>rd</sup> box: L= \_\_\_\_\_, W= \_\_\_\_\_, H= \_\_\_\_\_

☞ Use the formula for volume of a rectangular solid to find a general equation. Use x for the sides square pieces you will cut out of your net.



This equation will be: \_\_\_\_\_

(HINT: It is NOT L x W x H you must take into consideration the pieces you cut out)

☞ Calculate the maximum volume based on the dimensions you propose. You must have at least 3 calculations here.

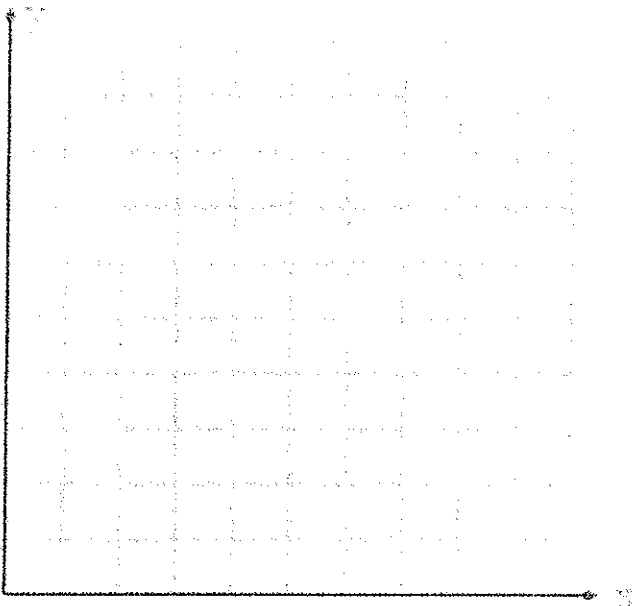
	Cut size, x, (in)	Length (in)	Width (in)	Height (in)	Volume (cubic inches)
Box #1					
Box #2					
Box #3					

Show your work for the calculations above:

Send a group member to the graph at the front of the room to graph a point **for each box** . This point should represent the volume of your box and the size of the cut. This is the largest volume possible with the dimensions you choose.

☞ Draw a graph of Volume vs. “x” using all the class points. Only graph the portion of the equation that appears in the first quadrant.

Why?



Make sure to:  ☞ Label the x and y-axis with titles.  The x-axis represents: <hr/> The y-axis represents: <hr/>
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Use the graphing calculator to make a plot of every possible amount of volume corresponding to the size of the cuts? Then find the regression equation for the class data.

Regression equation: \_\_\_\_\_

Questions:

What is the approximate ideal cut needed to obtain the maximum capacity of the general equation?

What is the maximum volume for this cut size?

Write a summary of what you've discovered here today. Make sure to use correct math vocabulary.

	<b>Exceeds Expectations (4 points)</b>	<b>Meets Expectations (3 points)</b>	<b>Almost meets Expectations (2 points)</b>	<b>Below Expectations (1 point)</b>
<b>Response to Questions</b>	-clear, with appropriate math language to support ideas -in clear complete sentences	-clear ideas but lacks correct vocabulary -Some complete sentences	-Unclear or has several grammatical mistakes -answered all questions but used symbols for words	-incomplete thoughts or lacks math language -incomplete or unclear sentences
<b>Construction of Boxes</b>	-Varied cuts -All three boxes are sturdy	-Varied cuts -One or boxes are not sturdy or different	-Cuts are not precise -Boxes are not sturdy	-Missing one or more boxes -Two or more boxes have the same size cuts
<b>Calculations</b>	-All charts are filled in -All work shown for calculations of volume	-Chart filled in -Some work shown but not all	-Chart partially filled in or missing key elements -Calculations missing	-Incomplete Chart -Missing calculations
<b>Graph Class Individual</b>	-All class points are represented -Axis's are labeled correctly -Scale is labeled -Smooth curve is drawn	-All class points are represented -Axis are not labeled correctly -Scale is labeled -Smooth curve is drawn	-Class points are missing -Axis are not labeled correctly -Scale is not labeled -Smooth curve is drawn	-Class points are missing -Axis are not labeled -Scale is not labeled -Curve is not drawn or complete
<b>Regression</b>	-Regression equation is used to find the maximum cut size and volume for class data -Regression equation is used to find the maximum cut size and volume for general equation	-Maximum cut size is given but maximum volume is missing -Labels are missing	-Maximum cut size is given but label is missing for class data	-Cut size and label are missing for one or both equations.
<b>TOTAL</b>				

