

Cornell Notes

Name Alycia

Date 12.15.11

Topic Algebra II

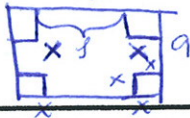
Class/
Subject ~~Geometry~~ / Assembly

10:15

Rules:

Net.

9x12 Sheet of
paper
12



get into groups of two.
• also have an extra
piece of paper.

Worksheet: Maximizing the
Volume of a Box.

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.

****Before cutting****

Decide on 3 different
sized boxes to make.

Net - unfolded box
outside form.

With a 9x12 sheet of paper,
cut the edges to form boxes.
we will determine which
Box has the Most Volume.

$$l = 12 - 2x \quad w = 9 - 2x \quad h = x$$

Create a box using a 12x9 sheet of paper to
determine ~~the length~~ of which box has the Maxime
Volume.

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Name *Alycia-tutor Asberry.*

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10:25.

check your work!

The next step:

Volume:

you want to decide on the length of the box first. height.

Start with height because it is X. This will make it easier to find length & width.

*Make sure you show your work at the bottom of the worksheet.

Once you find measurements, have Mrs. Asberry check them.

Then 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.

$l \times w \times h$

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:

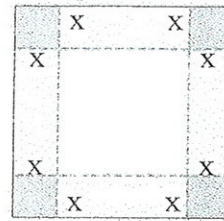
- 1st box: L= _____, W= _____, H= _____
- 2nd box: L= _____, W= _____, H= _____
- 3rd box: L= _____, W= _____, H= _____

Example: 12×9
will be based on the 12×9 length paper.

☞ 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 $L \times W \times H$ you must take into consideration the pieces you cut out)



$l = 12 - 2x$
 $w = 9 - 2x$
 $h = x$
 Sub in

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

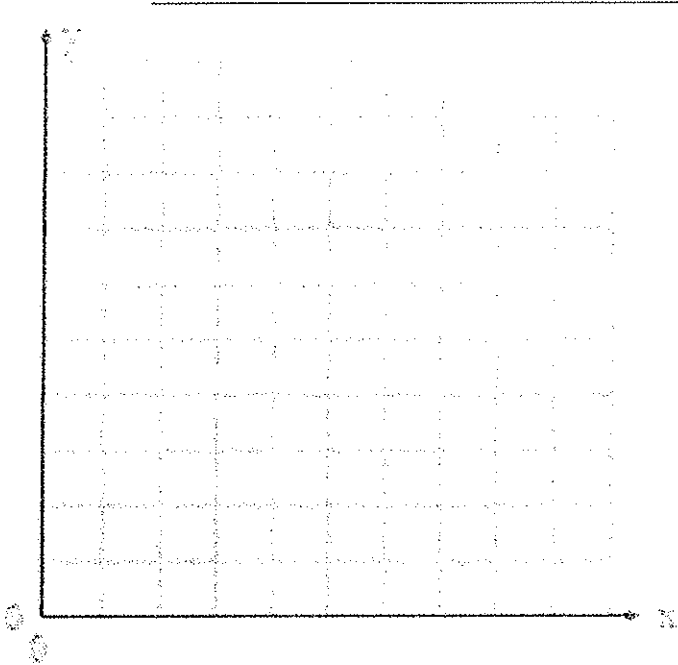
	Cut size, x , (cm) in.	Length (cm) in.	Width (cm) in.	Height (cm) in.	Volume (cubic centimeters) inches.
Box #1					
Box #2					
Box #3					

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:

The y-axis represents:

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.

	Exceeds Expectations (4 points)	Meets Expectations (3 points)	Almost meets Expectations (2 points)	Below Expectations (1 point)
Response to Questions	-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
Construction of Boxes	-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
Calculations	-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
Graph Class Individual	-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
Regression	-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.
TOTAL				

