

Name:

Cutting Corners

Group Product

Facilitator: Read your job description and be sure to follow it!

Recorder/Reporter: Your job is to record your group's responses to the following.

1. Use the regression feature to find a function to model the data.
2. Copy down the equation that best fits your data.

$$y_1 \sim ax_1^3 + bx_1^2 + cx_1 + d$$

3. Use your model to find the maximum volume of the box.

The maximum is 748 cm^3

4. What size cut from each corner should be used in order to maximize the volume?

4 size cut

5. What are the x-intercepts? Interpret the meaning of each in the context of this situation.

0, 0 and 9.5, 0, also 12.5, 0
means that the certain cut size will have no volume

6. What are the possible values for the height of the box? Why does that make sense?

2, 3, 4, 5, 6, 7, 8, 9 it makes sense
b ho you're cutting away

Name: _____

Period: _____

7. What part of this worksheet was easiest for your group?

entering the regression lines

8. Where did your group struggle the most?

thinking about the possible height values

Period: _____

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1. Use the regression feature to find a function to model the data.
2. Copy down the equation that best fits your data.

$$y_1 = ax^{\frac{3}{b}} + bx^{\frac{2}{1}} + cx + d$$

3. Use your model to find the maximum volume of the box.

$$748 \text{ cm}^3$$

4. What size cut from each corner should be used in order to maximize the volume?

4 size cut

5. What are the x-intercepts? Interpret the meaning of each in the context of this situation. $(-2.638, 0)$, $(9.2026, 0)$, $(24.411, 0)$

6. What are the possible values for the height of the box? Why does that make sense?

$(2, 798)$, of the height of the box

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Period: _____

7. What part of this worksheet was easiest for your group?

8. Where did your group struggle the most?

100%

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$$y_1 \sim ax_1^3 + bx_1^2 + cx_1 + d$$
$$y_1 \sim (1.0303)x_1^3 + (-32)x_1^2 + (141.47)x_1 + (86)(6)$$

3. Use your model to find the maximum volume of the box.

4. What size cut from each corner should be used in order to maximize the volume?

5. What are the x-intercepts? Interpret the meaning of each in the context of this situation.

6. What are the possible values for the height of the box? Why does that make sense?

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7. What part of this worksheet was easiest for your group?

8. Where did your group struggle the most?

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1. Use the regression feature to find a function to model the data.

Cubic function

2. Copy down the equation that best fits your data.

$$y_1 \sim 1.0303x_1^3 + (-32)x_1^2 + 141.97x_1 + 616$$

3. Use your model to find the maximum volume of the box.

The maximum volume according to the model is about 780.

4. What size cut from each corner should be used in order to maximize the volume?

2 cm.

5. What are the x-intercepts? Interpret the meaning of each in the context of this situation.

(9.286, 0)

When the cut size is 9.286 cm, the volume will be 0.

6. What are the possible values for the height of the box? Why does that make sense?

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1. Use the regression feature to find a function to model the data.

$$y_1 \sim ax_1^2 + bx_1 + c$$

2. Copy down the equation that best fits your data.

$$y_1 \sim ax_1^3 + bx_1^2 + cx_1 + d$$

3. Use your model to find the maximum volume of the box.
4. What size cut from each corner should be used in order to maximize the volume?
5. What are the x-intercepts? Interpret the meaning of each in the context of this situation.
6. What are the possible values for the height of the box? Why does that make sense?

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Recorder/Reporter: Your job is to record your group's responses to the following.

1. Use the regression feature to find a function to model the data.

~~Y = a~~ $a = 1.0303$ $b = -32$ $c = 141.97$ $d = 616$

2. Copy down the equation that best fits your data.

$$y_1 \sim ax^3 + bx^2 + cx + d$$

3. Use your model to find the maximum volume of the box.

2,728 is the maximum volume of a box

4. What size cut from each corner should be used in order to maximize the volume?

1 cm is going to maximize the volume b/c the pattern we found was the smaller the cut, the greater the SA.

5. What are the x-intercepts? Interpret the meaning of each in the context of this situation. (9.286, 0)

6. What are the possible values for the height of the box? Why does that make sense?

Name: _____

Period: 5

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1. Use the regression feature to find a function to model the data.

$$a = 1.0303 \quad b = -32 \quad c = 141.97 \quad d = 616$$

2. Copy down the equation that best fits your data.

$$y_i \sim ax_i^3 + bx_i^2 + cx_i + d$$

3. Use your model to find the maximum volume of the box.

798 is the maximum volume of the box.

4. What size cut from each corner should be used in order to maximize the volume?

1 cm is going to maximize the volume more

5. What are the x-intercepts? Interpret the meaning of each in the context of this situation.

The x-intercept is 9.286 meaning the volume is 0 cm^3

6. What are the possible values for the height of the box? Why does that make sense?

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2. Copy down the equation that best fits your data.

$$y_1 \sim ax_1^3 + bx_1^2 + cx_1 + d$$

cubic

3. Use your model to find the maximum volume of the box.

(2, 798)

4. What size cut from each corner should be used in order to maximize the volume?

Cut size 2

5. What are the x-intercepts? Interpret the meaning of each in the context of this situation.

(9.225, 0)

highest

6. What are the possible values for the height of the box? Why does that make sense?

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1. Use the regression feature to find a function to model the data.
2. Copy down the equation that best fits your data.

$$Y_1 \sim ax^2 + bx + c$$

$$a = -15 \quad c = 735$$

$$b = 58$$

3. Use your model to find the maximum volume of the box.

$$791.067$$

4. What size cut from each corner should be used in order to maximize the volume?

$$1.933$$

5. What are the x-intercepts? Interpret the meaning of each in the context of this situation.

The x-intercept means if you cut 9.193×9.193 the volume will be zero.

6. What are the possible values for the height of the box? Why does that make sense?

Cut size = height of the box

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Period: _____

7. What part of this worksheet was easiest for your group?

Plugging in the equation

8. Where did your group struggle the most?

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$$Y_1 \sim ax_1^2 + bx_1 + c$$

$$a = -15$$

$$b = 58 \quad c = 735$$

3. Use your model to find the maximum volume of the box.

$$791.067$$

4. What size cut from each corner should be used in order to maximize the volume?

$$1.933$$

5. What are the x-intercepts? Interpret the meaning of each in the context of this situation.

The x-intercept means if you cut 9.295×9.995 the volume will be zero.

6. What are the possible values for the height of the box? Why does that make sense?

Cut size = Height of the Box

Name: _____

Period: _____

7. What part of this worksheet was easiest for your group?

The equation was the easiest for my group since we looked it up.

8. Where did your group struggle the most?

The x -Intercepts because we were temporarily off top.

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1. Use the regression feature to find a function to model the data.

2. Copy down the equation that best fits your data.

$$y_1 \sim mx_1^2 + d$$

3. Use your model to find the maximum volume of the box.

4. What size cut from each corner should be used in order to maximize the volume?

$$2 \text{ by } 2$$

5. What are the x-intercepts? Interpret the meaning of each in the context of this situation.

6. What are the possible values for the height of the box? Why does that make sense?

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