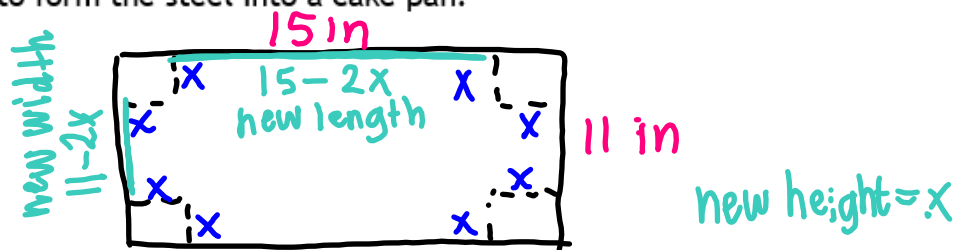


Algebra 2 Honors Chapter 7 Graphing Calculator Performance Task

Scenario: You are working for the Charleston Packaging Company, and you are currently on a team that is working together to create a cake pan for Pyrex with no lid that holds the most amount of cake batter as possible. Pyrex's machine that produces the cake pan has not been programmed yet for the size of steel they have in stock. By completing all of the tasks below, you will determine how the steel should be cut to maximize the volume of the pan.

Task 1: Diagram

You and your team just received the dimensions of the piece of steel you will be using to create the cake pan with no lid. Pyrex currently has steel pieces that are 15 inches long and 11 inches wide. Squares with sides of length x will be cut out of each corner and the sides will be folded up to create the pan. Create a diagram of the steel piece showing the dimensions and the pieces that must be cut out to form the steel into a cake pan.



Task 2: Volume Function

Develop a function for the volume of the box based on the diagram you just created.

$$V = lwh$$

$$V = (15-2x)(11-2x)(x)$$

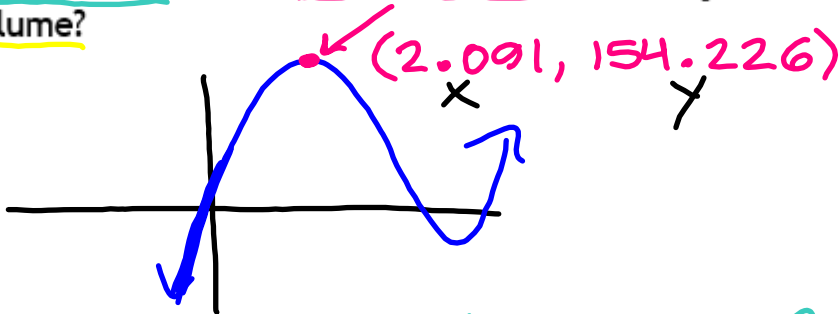
$$V = (165 - 30x - 22x + 4x^2)x$$

$$V = 4x^3 - 52x^2 + 165x$$

↑
y-value

Task 3: Determine the Maximum

Use the graph of your polynomial to determine the dimension of the piece that should be cut out to maximize the volume of your box. What is the maximum volume? find x



dimension ≈ 2.091 in \times
 2.091 in

max volume ≈ 154.226 in³