# **Mod 5 Performance Task on Polynomials: Toy Box for Tommy**

Topics: Algebraic Representation, Adding and Multiplying Polynomials

Summary:

You are volunteering for Habitat for Humanity. Your group is building a home for a family with a young son, Tommy, who would like a toy box. Habitat has limited resources and needs you to make a box that will hold the most toys out of a flat sheet of strong cardboard that is 4 feet wide and 8 feet long.

Requirements:

* A scale drawing showing the dimensions of the box that will maximize the volume.
* The function used to solve the problem along with a graph of the function identifying the zeros and y-intercept.
* An explanation so others can duplicate the box and understand why these are the best dimensions to maximize the volume for the 4 foot by 8 foot sheet of cardboard. The explanation should include the relationship between the graph, the function, and the dimensions of the box.

# **Module 5 Rubric for Performance Task: Toy Box for Tommy**

|  |  |  |
| --- | --- | --- |
| **Level** | **Description** | **Characteristics** |
| **4** | There is clear and convincing evidence that the **student has mastered and thoroughly understands** the key mathematical ideas of the problem. | The student has correctly identified the dimensions and the function to maximize the volume, accurately drawn the scale drawing and graph of the function, and completely described the relationship between the graph, the function, and the dimensions of the box. |
| **3** | There is some evidence that the **student has a complete understanding** of the key mathematical ideas of the problem. | The student has correctly identified the dimensions and the function to maximize the volume, accurately drawn the scale drawing and graph of the function, and completely described the relationship between the graph, the function, and the dimensions of the box, but with minor omissions. |
| **2** | There is evidence that the **student has a partial understanding** of the key mathematical ideas of the problem. | The student has correctly identified the dimensions and the function to maximize the volume, accurately graphed the function, but several omissions prevent a correct solution. |
| **1** | There is evidence that the **student has only a limited understanding** of the key mathematical ideas of the problem. | The student has correctly identified the dimensions and the function to maximize the volume, but the task is incomplete and major omissions prevent a correct solution. |
| **0** | **Insufficient**. There is evidence that the **student has no apparent understanding** of the key mathematical ideas of the problem **or** there is **not enough evidence presented** **to judge the student’s knowledge** of the mathematics involved in this task. | |

* Identify dimensions and function to maximize volume.
* Scale drawings.
* Graph the function.
* Write a paragraph describing the relationship between the graph, function, and dimensions.

# Mod 5 Performance Task on Quadratics:

# Quadratic and Polynomial Functions

# Choose My Way

**Teacher Directions:**

This task should be given upon the completion of all the different ways that we have studied solving quadratic functions; factoring, completing the square, solving by square roots, graphing, quadratic formula.

**Student Directions:**

We have studied several ways to solve quadratic equations. Given the following equations, which method/methods would you choose that would be most efficient to solving each and why? Make sure that you support your choices with convincing arguments, that is, sound mathematical processes.

**Equations:**

1.  2. 

3.  4. 

5.  6. 

7.  8. 

9.  10. 

# Mod 5 Performance Task on Quadratics

**Student Directions:**

We have studied several ways to solve quadratic equations. Given the following equations, which method/methods would you choose that would be most efficient to solving each and why? Make sure that you support your choices with convincing arguments, that is, sound mathematical processes.

**Equations:**

1.  2. 

3.  4. 

5.  6. 

7.  8. 

9.  10. 