

**Day 10 – Applications of the Vertex
Practice Assignment****Name:** _____**Date:** _____ **Block:** _____

Review – Find the vertex of the following equation: $y = 2x^2 - 4x + 5$.

Directions: Answer the following questions that pertain to using applications of the vertex.

1. The valley between two mountains whose peaks touch the x-axis is $y = 40.4x^2 - 404x$, where x and y are measured in feet. How deep is the valley?

2. A model rocket is launched straight upward. The path of the rocket is modeled by $h = -16t^2 + 200t$, where h represents the height of the rocket and t represents the time in seconds.

a. What is its maximum height?

b. Is it still in the air after 8 seconds? Explain why or why not.

c. Is it still in the air after 14 seconds? Explain why or why not.

3. A model for a company's revenue is $R = -15p^2 + 300p + 12,000$, where p is the price in dollars of the company's product. What price will maximize revenue? What will be the maximum revenue?

4. The photo shows the Verrazano-Narrows Bridge in New York, which has the longest span of any suspension bridge in the United States. A suspension of cable of the bridge forms a curve that resembles a parabola. The curve can be modeled with the function $y = 0.0001432(x - 2130)^2$, where x and y are measured in feet. The origin of the function's graph is at the base of one of the two towers that support the cable.

a. What is the vertex of the bridge between two towers?

b. How far apart are the towers?



5. A sports store sells about 50 mountain bikes per month at a price of \$220 each. For each \$20 decrease in price, about 10 more bikes per month are sold. Complete the table below

Price	Bikes	Revenue
220	50	

a. How many prices changes does it take to make a maximum amount of revenue?

b. At what price and how many bikes need to be sold to maximize their revenue?