

Lesson 1 Review

Nolan Arenado, All-Star third baseman for the Colorado Rockies, hit a home run last night. He made contact with the ball 4.5 feet off the ground and had an initial upward velocity of 147 feet per second. Write an function rule to find the height $h(t)$ at various times t .

Without graphing, find the height of the ball when it reaches its maximum height.

How long did it take for the ball to reach the maximum height?

A volleyball player serves the ball at a point 6 feet off the ground. The ball hits the ground barely in play 1.7 seconds after she serves. Use the information to find the initial upward velocity.

Write the equation that relates the height of the ball h , to its time in the air t .

A Rainbow Bridge is a stone arch in the Glen Canyon National Recreation Area in Utah. The rule $y = -0.015x^2 - 3.375x$ can be used to get a graph that approximates the shape of the arch. In this rule, y is the height (in feet) of the arch, and x is the horizontal distance (in feet) from the point where one side of the arch meet the ground.



Without graphing find the distance between the two points where the arch meets the grounds? Show your work.

How high the the arch at its highest point? Show your work!

Without using graphing technology, sketch the pattern of graphs you would expect for the next set of quadratics functions.

$$y = -x^2 - 6x$$

$$y = x^2 + 4x - 1$$

Describe the relationship between the first rule to the second rule of each pair of function.

a. $y = 2x^2$

$$y = -2x^2$$

b. $y = x^2$

$$y = x^2 - 8x$$

c. $y = x^2 - 3x - 4$

$$y = x^2 - 3x$$

Match the equation to the graph and be prepared to explain your answer.

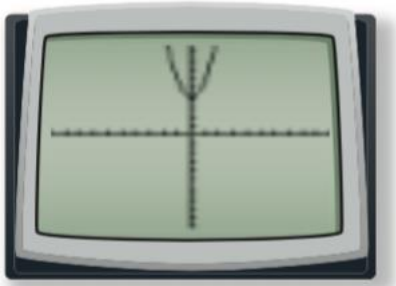
Rule I $y = x^2 - 4$

Rule II $y = 2x^2 + 4$

Rule III $y = -x^2 + 2x + 4$

Rule IV $y = -0.5x^2 + 4$

A



Rule

Explain

B



Rule

Explain

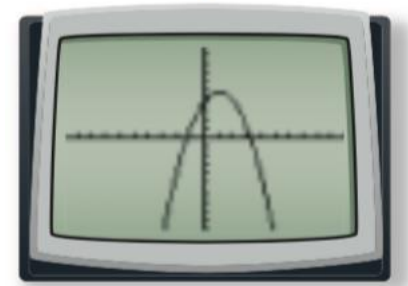
C



Rule

Explain

D



Rule

Explain

Perform the indicated operation.

a. $x(100 + 2x) + 3(x + 1) + 25$

b. $4(2x + 5) - 2x(x - 1)$

c. $(2x + 5)(x - 3)$

d. $(3x - 1)(x + 4)(x - 1)$