



8-4 Reteach to Build Understanding

Modeling with Quadratic Functions

1. Match the phrase with the correct term of the vertical motion model.

$$h(t) = -16t^2 + v_0t + h_0$$

initial height

gravitational constant

initial velocity

2. In parts (a) and (b), determine which values are the initial height and the initial velocity of each scenario.

- a. A ball is dropped from the top of 10-foot tall bleachers at an initial velocity of 2 ft/s.

initial height _____ initial velocity _____

- b. A ball is kicked with an initial velocity of 9 ft/s from a height of 1 foot.

initial height _____ initial velocity _____

3. Kiyo is designing a rectangular garden with a 2-ft wide path all the way around it. The length of the garden is 3 times as long as the width. Kiyo models the area of his garden and the path with the equation $f(x) = (x + 2)(3x + 2)$. Explain Kiyo's error.

4. Compare two different quadratic models by completing the residuals tables below. Then determine the average residual and answer parts (a)–(c).

$$g(x) = -3x^2 + 5x + 8$$

x	0	1	2	3	4
Actual Value	4	2	8	7	3
Predicted Value	8	10	6	-4	-20
Residual (Actual – Predicted)	-4	-8			

$$h(x) = -2x^2 + 7x + 4$$

x	0	1	2	3	4
Actual Value	4	2	8	7	3
Predicted Value	4	9	10	7	0
Residual Actual – Predicted					

- What is the average residual of $g(x)$?
- What is the average residual?
- Which equation more closely models the actual scenario? Explain.