

Unit 7 Lesson 24: Using Quadratic Equations to Model Situations and Solve Problems

1 Equations of Two Lines and A Curve (Warm up)

Student Task Statement

1. Write an equation representing the line that passes through each pair of points.
 - a. (3, 3) and (5, 5)
 - b. (0, 4) and (-4, 0)
2. Solve this equation: $x + 1 = (x - 2)^2 - 3$. Show your reasoning.

2 The Dive

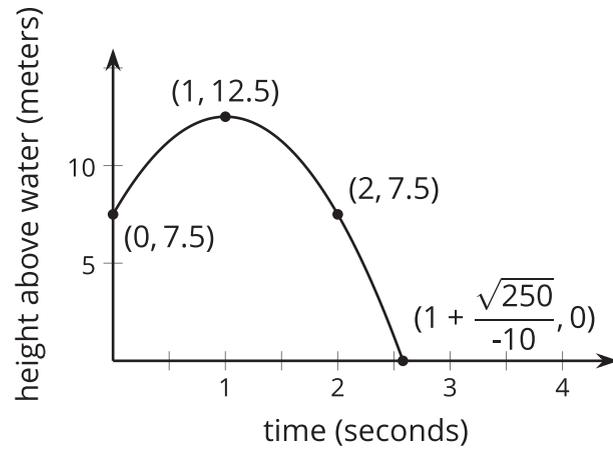
Student Task Statement

The function h , defined by $h(t) = -5t^2 + 10t + 7.5$, models the height of a diver above the water (in meters), t seconds after the diver leaves the board. For each question, explain how you know.

1. How high above the water is the diving board?
2. When does the diver hit the water?

3. At what point during her descent toward the water is the diver at the same height as the diving board?
4. When does the diver reach the maximum height of the dive?
5. What is the maximum height the diver reaches during the dive?

Activity Synthesis



3 A Linear Function and A Quadratic Function

Student Task Statement

Here are graphs of a linear function and a quadratic function. The quadratic function is defined by the expression $(x - 4)^2 - 5$.

Find the coordinates of P , Q , and R without using graphing technology. Show your reasoning.

