Zeros of a Quadratic Function Application

Student Activity

Name _____

Class _____

Open the TI-Nspire document
Zeros_of_a_Quadratic_Function_Application.

In this activity, you will use quadratic functions to solve an application. Graphs of pairs of linear functions and the related quadratic functions will be used to find solutions to the application.

1.1	1.2	1.3	► Zeros_of_a_...ion ▼

Zeros of a Quadratic Function Application

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Using the zeros of a quadratic function to solve an application
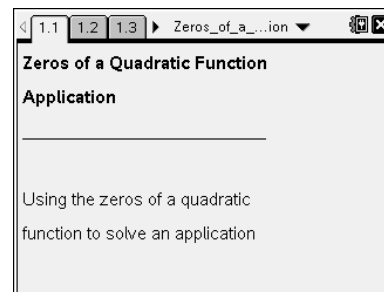
Move to page 1.2.

Press (ctrl) ▶ and (ctrl) ◀ to navigate through the lesson.

Suppose you have decided to have a rectangular swimming pool installed surrounded by a deck of uniform width. The dimensions of the space available for the project (pool and deck) are 50 feet by 36 feet. In the diagram on page 1.3, x represents the width of the deck.

Move to page 1.3.

1. What algebraic expression would be used to represent the longer side of the pool?

2. What algebraic expression would be used to represent the shorter side of the pool?

3. Using the answers from Questions 1 and 2, what quadratic expression would be used to represent the area of the pool? Showing your work, write the expression in expanded form.

Move to page 1.8.

4. The results from Questions 1–3 are shown in the diagram on page 1.8. Why is $2x$ subtracted from the length and width of the large rectangle?

The company that will be installing the pool has given you four pool size options, which are shown below. The width of the deck surrounding the pool will depend on which pool option is chosen. In order to make the decision, you decide to find the width of the deck surrounding the pool for each option.

Option	Area of Pool
1	1176 ft^2
2	912 ft^2
3	680 ft^2
4	480 ft^2

Move to page 1.12.

Page 1.12 shows the graphs of the quadratic equations for the different pool options. Use the up and down arrows to see all four graphs. These graphs can be used to determine the width of the deck for each pool option.

5. On page 1.12, what do the dashed lines labeled y_1 and y_2 represent?

6. What part of the graphs represents the width of the deck?

7. Use the graph on page 1.12 to help you complete the table below to find the deck width for each pool option.

Area of pool (ft^2)	Area of pool as a quadratic equation in simplest form (show work)	Linear factors of quadratic equation	Zeros	Deck width (ft)
1176	$4x^2 - 172x + 1800 = 1176$ $4x^2 - 172x + 624 = 0$			
912				
680				
480				