PROBLEM SOLVING WORKSHOP
LESSON 4.5

Using ALTERNATIVE METHODS

TEKS 2A.6.B, 2A.8.A, 2A.8.C, 2A.8.D

Another Way to Solve Example 5, page 269

MULTIPLE REPRESENTATIONS In Example 5 on page 269, you solved a quadratic equation by finding square roots. You can also solve a quadratic equation using a table or a graph.

PROBLEM

SCIENCE COMPETITION For a science competition, students must design a container that prevents an egg from breaking when dropped from a height of 50 feet. How long does the container take to hit the ground?

METHOD 1

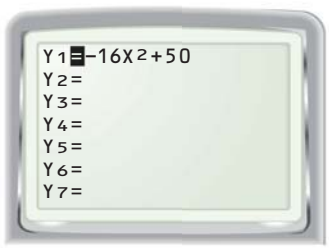
Using a Table One alternative approach is to write a quadratic equation and then use a table of values to solve the equation. You can use a graphing calculator to make the table.

STEP 1 **Write** an equation that models the situation using the height function $h = -16t^2 + h_0$.

$h = -16t^2 + h_0$ **Write height function.**

$0 = -16t^2 + 50$ **Substitute 0 for h and 50 for h_0.**

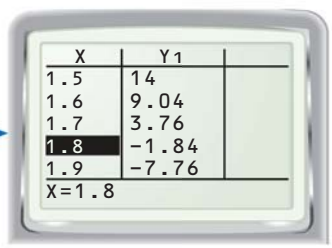
STEP 2 **Enter** the function $y = -16x^2 + 50$ into a graphing calculator. Note that time is now represented by x and height is now represented by y.



STEP 3 **Make** a table of values for the function. Set the table so that the x-values start at 0 and increase in increments of 0.1.

STEP 4 **Scroll** through the table to find the time x at which the height y of the container is 0 feet.

The table shows that $y = 0$ between $x = 1.7$ and $x = 1.8$ because y has a change of sign.



▶ The container hits the ground between 1.7 and 1.8 seconds after it is dropped.