

## PROBLEM SOLVING

### EXAMPLE 6

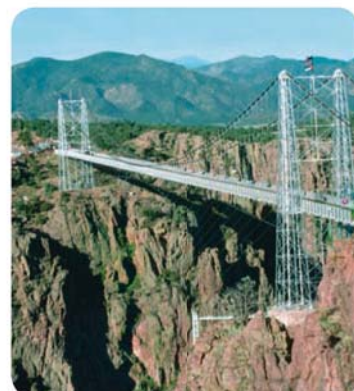
on p. 713  
for Exs. 43–45



**GRAPHING CALCULATOR** You may wish to use a graphing calculator to complete the following Problem Solving exercises.

43. **SUSPENSION BRIDGE** The time  $t$  (in seconds) it takes an object dropped from a height  $h$  (in feet) to reach the ground is given by the function  $t = \frac{1}{4}\sqrt{h}$ .
- Graph the function and identify its domain and range.
  - The Royal Gorge Bridge in Canyon City, Colorado, is the world's highest suspension bridge. It takes about 8 seconds for a stone dropped from the bridge to reach the gorge below. About how high is the bridge?

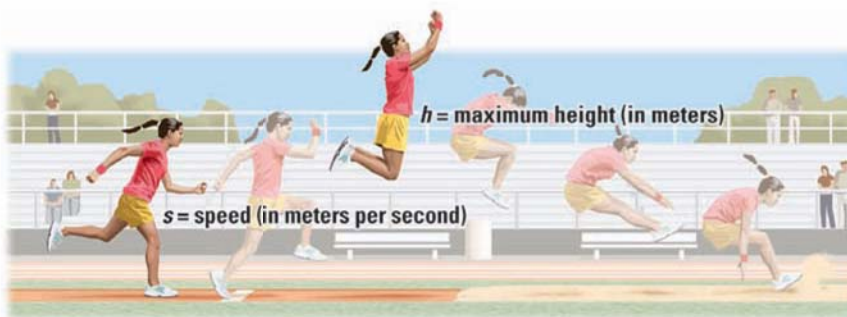
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44. **OCEANOGRAPHY** Ocean waves can be shallow water, intermediate depth, or deep water waves. The speed  $s$  (in meters per second) of a shallow water wave can be modeled by the function  $s = 3.13\sqrt{d}$  where  $d$  is the depth (in meters) of the water over which the wave is traveling.
- Graph the function and identify its domain and range.
  - A tsunami is a type of shallow water wave. Suppose a tsunami has a speed of 200 meters per second. Over approximately what depth of water is the tsunami traveling?

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45. **LONG JUMP** A function for the speed at which a long jumper is running before jumping is  $s = 10.9\sqrt{h}$  where  $s$  and  $h$  are defined in the diagram. Graph the function and identify its domain and range. To the nearest tenth, approximate the maximum height reached when the long jumper's speed before jumping is 10.25 meters per second.



46. **MULTI-STEP PROBLEM** The reading age of written materials is the age at which an average person can read and understand the materials. A function that is sometimes used to identify the reading age  $r$  (in years) of written materials is  $r = \sqrt{w} + 8$  where  $w$  is the average number of words with 3 or more syllables in samples taken from the written materials.
- Graph the function and identify its domain and range.
  - What is the average number of words with 3 or more syllables in samples taken from material that can be read and understood by a 10-year-old?