Name Date

Enrichment and Extension

5.3

Using Slope to Design Handicap Ramps

According to the Americans with Disabilities Act, the maximum rise to run ratio for all handicap ramps is 1 : 12. Also, there must be a landing, or flat rest area,   
at the top and bottom of all ramps. These landings must be at least 60 inches in length. If there is a change in direction on the ramp, there must be a flat landing that is at least 60 inches by 60 inches.

1. A ramp with a rise of 5 inches must have a run of at least how many inches? how many feet?

2. Why do you think there is a maximum slope for handicap ramps?

3. What would be the advantages and disadvantages of making a ramp that is less steep?

4. Your school is being renovated and a new handicap ramp must be built. The bottom of the new front door is 20 inches above the sidewalk. What   
is the minimum length (in feet) of a straight ramp to this door, including   
the landings at the top and bottom?

5. An existing ramp on the old part of the school has a rise of 10.5 inches   
and a run of 12 feet 3 inches, not including the landings. Does it meet   
the requirements or will it have to be changed? Explain.

6. At the main bus entrance, there is a ramp with a change in direction. It has a sloping part with a rise of 5 inches and a run of 6 feet 8 inches, a landing where there is a 90 degree turn, and another sloping part with a rise of   
7.5 inches and a run of 13 feet 9 inches. Which part of the ramp is steeper? Why might the ramp have been designed in this way?

7. Another ramp with an overall rise of 30 inches has to be built to replace   
the ramp described in Exercise 6. It must have two sloping parts that should have the same slopes as the two sloping parts of the ramp in Exercise 6. Both parts should have a rise of 15 inches, with a landing in between. Find the lengths of both sloping parts of the ramp.

8. Find a place in your school, home, neighborhood, or elsewhere that could use a ramp. Measure the rise of that area. Then design a ramp, and draw a picture or describe it in detail. Be sure to tell how long each portion of the ramp should be as well as the overall length.