

Slope Applications:

Draw a diagram, label the diagram and do the appropriate calculations.

1. Shaun wants to build a skateboard ramp. He knows that the slope he would like is 0.32 and the space that he has to work in allows for a total run of 22 feet.
 - a) What would be the height of his ramp?
 - b) What angle does the ramp make with the ground?
 - c) What is the length of the ramp?
2. Sam has to build a 4-step staircase from his back deck to the yard. The deck is 50 inches off the ground and the run of the stairs is to be 72 inches.
 - a) What is the slope of the staircase?
 - b) What is the rise and run of each step?
 - c) What is the slope of each step?
3. The safety standard for using a ladder is defined as the 1/4 rule. Translated this means that for every four feet the ladder reaches up a wall, the base should be a foot away from the wall.
 - a) If the base of a ladder is placed a distance of 3.5 feet from the wall, the top would safely touch the wall at what height?
 - b) If a ladder touches the wall at a height of 12.5 meters, how far from the wall should be the base of the ladder? How long a ladder should be used if we take into account that this extension ladder should have a safety overlap of 1 meter?
4. George has been hired to build a wheel chair ramp. The building code calls for a rise of 1 inch for every 12 inches.
 - a) How long a ramp would be required if the rise is 4 feet?
 - b) How high would a ramp reach if the run of the ramp was 32 feet?
 - i) What angle does the ramp make with the ground?
 - ii) How long would the ramp be?
5. A group of friends are hiking at Jasper National Park. They have hiked up a trail that has a run of 5 km with a calculated slope of 0.54.
 - a) If we assume they start at an elevation of 2000m, at what elevation would they be after completing their hike?
 - b) What would the average angle of their climb?
 - c) What distance have they covered in their climb?
6. Many roads and highways have signs giving the percentage grade for the road. A 7% grade, for example, means that the altitude changes by 7 feet (meters) for each 100 feet (meters) of horizontal distance.
 - a) Suppose an uphill road sign indicates a road grade of 9%. What is the angle of elevation of the road?
 - b) If a road has a grade of 4%, what would be the traveler's change in elevation in

a horizontal distance of 1.6 km?

7. Karin's savings account balance changed from \$1240 in January to \$1750 in April. Find the average rate of change (slope) per month. Round your answer to the nearest dollar.
8. If Glenn bought a house in 1982 for a cost of \$94,000 and had an appraisal done in 2010 and found out the value of the house was now \$426,000. Find the annual rate of change in the value of the house in dollars per year. (round off to the nearest dollar)