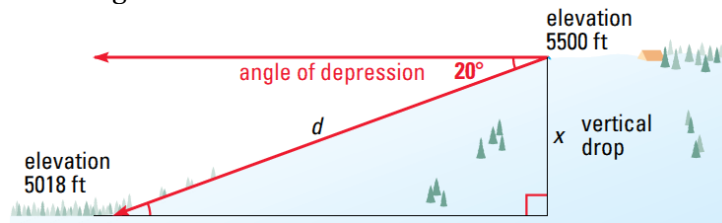


7.7 APPLICATIONS W/RIGHT TRIANGLES

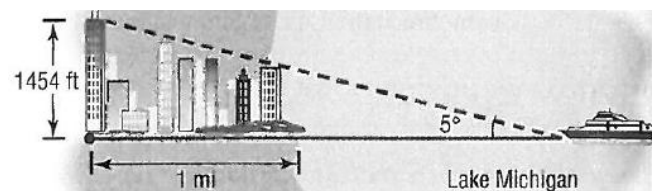
SHOW ALL WORK ON A SEPARATE SHEET OF PAPER.

Draw a diagram that represents the situation. Then set up and solve a trigonometric equation (or ratio). Round solutions to the nearest tenth; unless otherwise stated.

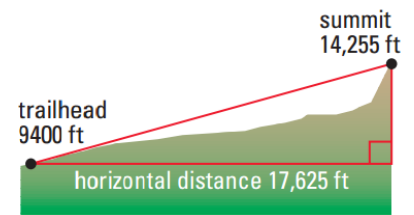
- The ground crew for a hot-air balloon can see the balloon in the sky at an angle of elevation of 11° . The pilot radios to the crew that the hot-air balloon is 950 feet above the ground. What is the horizontal distance, d , of the hot-air balloon from the ground crew?
- Suppose you stand at the top of a ski slope and look down at the bottom. The angle that your line of sight makes with a line drawn horizontally is called the angle of depression, as shown below.
 - The vertical drop is the difference in the elevations of the top and bottom of the slope. Find the vertical drop, x , of the slope in the diagram.



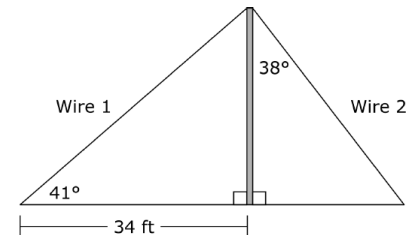
- Use a trigonometric ratio to estimate the distance, d , a person skiing would travel on this slope.
- The angle of depression from the top of the Smoketown Lighthouse 120 feet above the surface of the water to a buoy is 10° . How far is the buoy from the lighthouse?
 - From a point 65 feet from the base of a telephone pole stands a concerned mother, the angle of elevation to her son working on the pole is 55° . If he became the unlucky recipient of an electric shock, he'd fall straight down said pole. How many feet would he drop?
 - A ladder 5 feet long leans against a wall and makes an angle of 65° with the ground. Find the distance from the wall to the base of the ladder.
 - An observer 5.2 kilometers from the launch pad observes a missile ascending. At a particular, the angle of elevation is 37.6° . How high is the missile?
 - A peregrine falcon perched atop a tall building spots its lunch on the ground below. If his prey is 1000 meters from the base of the building, and the building is 200 meters tall, what is the angle of depression from the falcon to its prey?
 - A ramp for wheelchair accessibility is to be constructed with an angle of elevation of 15° and a final height of 5 feet. How long is the ramp?
 - To determine the height of a radio transmission tower, a surveyor walks a distance of 300 meters from the base of the tower. The angle of elevation is then measured and found to be 40° . If the transit – the instrument used in surveying to measure angles – is 2 meters off the ground when the sighting is taken, how high is the radio tower?
 - The Willis Tower in Chicago is 1454 feet tall and is situated about 1 mile inland from the shore of Lake Michigan, as indicated in the figure. An observer in a pleasure boat on the lake directly in front of the Willis Tower looks at the top of the tower and measures the angle of elevation as 5° . How far offshore is the boat? (1 mile = 5,280 feet)



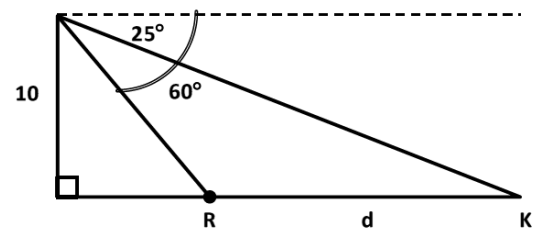
11. You are hiking up a mountain peak. You begin hiking at a trailhead whose elevation is about 9400 feet. The trail ends near the summit at 14,255 feet. The horizontal distance between these two points is about 17,625 feet. Estimate the angle of elevation from the trailhead to the summit.



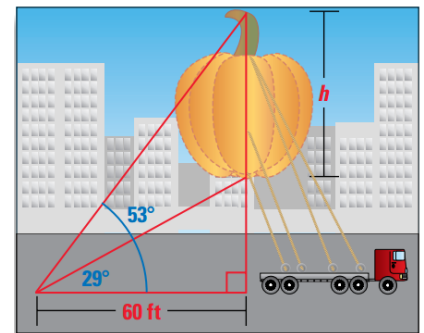
12. In the figure shown, a pole has two wires attached to it, one on each side, forming two right angles.
- How tall is the pole?
 - How far from the base of the pole does Wire 2 attach to the ground?
 - How long is Wire 1?



13. An aerial photographer is in an airplane at an altitude of 10 km and sees two towns, Racine and Kenosha, directly east of the plane. The angles of depression to Kenosha is 25° and to Racine is 60° . How far apart are the two towns?



14. You are at a parade looking up at a large balloon floating directly above the street. You are 60 feet from a point on the street directly beneath the balloon. To see the top of the balloon, you look up at an angle of 53° . To see the bottom of the balloon, you look up at an angle of 29° . What is the height of the balloon?



15. From a stationary hot-air balloon 500 feet above the ground, two sightings of a lake are made (see the figure). How long is the lake?

