**In Exercises 3–8 first draw a diagram.**

**3.** A kite is flying at an angle of elevation of about 40°. All 80 m of string have been let out. Ignoring the sag in the string, find the height of the kite to the nearest 10 m.

**4.** An advertising blimp hovers over a stadium at an altitude of 125 m. The pilot sights a tennis court at an 8° angle of depression. Find the ground distance in a straight line between the stadium and the tennis court. (*Note*: In an exercise like this one, an answer saying *about . . . hundred meters* is sensible.)

**5.** An observer located 3 km from a rocket launch site sees a rocket at an angle of elevation of 38°. How high is the rocket at that moment?

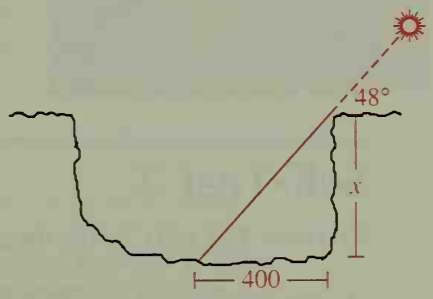
**6.** To land, an airplane will approach an airport at a 3° angle of depression. If the plane is flying at 30,000 ft, find the ground distance from the airport to the point directly below the plane when the pilot begins descending. Give your answer to the nearest 10,000 feet.

B

**7.** Martha is 180 cm tall and her daughter Heidi is just 90 cm tall. Who casts the longer shadow, Martha when the sun is 70° above the horizon, or Heidi when the sun is 35° above the horizon? How much longer?

**8.** Two buildings on opposite sides of a street are 40 m apart. From the top of the taller building, which is 185 m high, the angle of depression to the top of the shorter building is 13°. Find the height of the shorter building.

**9.** Scientists can estimate the depth of craters on the moon by studying the lengths of their shadows in the craters. Shadows' lengths can be estimated by measuring them on photographs. Find the depth of a crater if the shadow is estimated to be 400 m long and the angle of elevation of the sun is 48°.




**10.** A road has a 10% grade.
- **a.** What is the angle of elevation of the road?
- **b.** If the road is 2 km long, how much does it rise?

**11.** A road 1.6 km long rises 400 m. What is the angle of elevation of the road?

**12.** The force of gravity pulling an object down a hill is its weight multiplied by the sine of the angle of elevation of the hill.
- **a.** With how many pounds of force is gravity pulling on a 3000 lb car on a hill with a 3° angle of elevation?
- **b.** Could you push against the car and keep it from rolling down the hill?