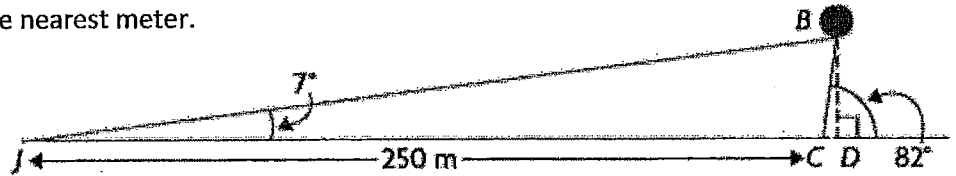


Analysis

Review Trigonometry Applications

Name \_\_\_\_\_

1. Colleen and Jose observed a tethered balloon advertising the opening of a new fitness center. They were 250 meters apart, joined by a line that passed directly below the balloon, and were on the same side of the balloon. Jose observed the balloon at an angle of elevation of  $7^\circ$  while Colleen observed the balloon at an angle of elevation of  $82^\circ$ . Determine the height of the balloon to the nearest meter.

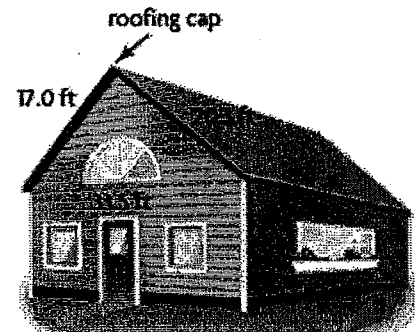


2. A ladder 20 feet long leans against the side of a house. Find the height from the top of the ladder to the ground if the angle of elevation of the ladder is  $60^\circ$ .

3. The roof of a house consists of two slanted sections, as shown. A roofing cap is being made to fit the crown of the roof, where the two slanted sections meet.

a) Determine the measure of the angle needed for the roofing cap, to the nearest tenth of a degree.

b) Determine the angle of elevation for each roof section, to the nearest tenth of a degree.



4. Standing on top of a 235 foot tall building, you spot your friend on the ground who is 94 feet away from the building.

a) What is the angle of depression you had to look to spot your friend?

b) What is the distance between you and your friend?

5. The entrance of the old town library is 2.5 feet above the ground level. A ramp from the ground level to the library entrance is scheduled to be built. The angle of elevation from the base of the ramp to its top is to be  $30^\circ$ . Find the length of the ramp

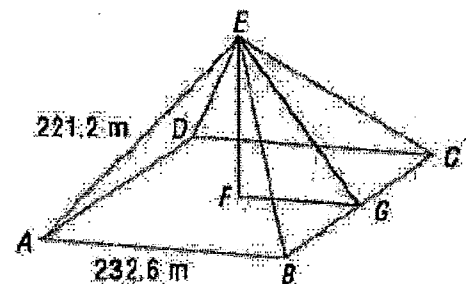
6. Mark is a landscaper who is creating a triangular planting garden. The homeowner wants the garden to have two equal sides and contain an angle of  $135^\circ$ . Also, the longest side of the garden must be exactly 5 meters.
- a) How long is the plastic edging that Mark needs to surround the garden?

b) Determine the area of the garden.

7. The Great Pyramid at Giza in Egypt has a square base with sides of 232.6 meters long. The distance from the top of the pyramid to each corner of the base was originally 221.2 meters.

a) Determine the angle each face makes with the base.

b) Determine the size of the apex angle of a face of the pyramid.

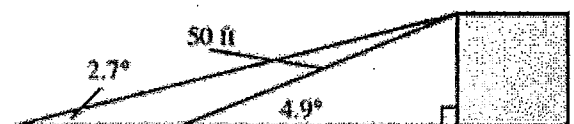


8. A steel cable zip-line is being constructed for competition on a reality television show. One end of the zip-line is attached to a platform on top of a 150 foot pole. The other end of the zip-line is attached to the top of a 5 foot stake. The angle of elevation from the top of the stake to the top of the platform is  $23^\circ$ .

a) How long is the zip-line?

b) How far is the stake from the pole?

9. A 50-foot ramp makes an angle of  $4.9^\circ$  with the horizontal. To meet new accessibility guidelines, a new ramp must be built so it makes an angle of  $2.7^\circ$  with the horizontal. How long is the new ramp?

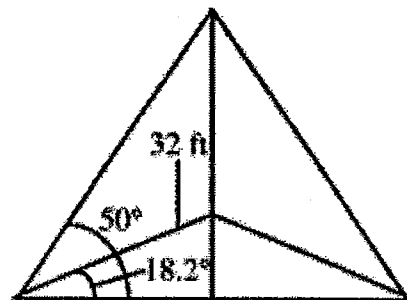


10. The angle of elevation from the bottom of the world's longest slide, located in Peru, Vermont, is approximately  $45^\circ$ . The slide covers a horizontal distance of 821 feet. Find the length of the slide.

11. The roof of a house is being reconstructed to accommodate heavy snows. The current 32-foot roofline makes an  $18.2^\circ$  angle with the horizontal. The owner has decided to construct the new roof so that it makes a  $50^\circ$  angle with the horizontal.

a) What will be the length of the new roofline?

b) How much higher will the new roof be?



12. A plane is flying at an elevation of 35,000 feet within sight of the Gateway Arch in St. Louis, Missouri. The pilot would like to estimate her distance from the Arch. She finds that the angle of depression to a point on the ground below the arch is  $22^\circ$ .

a) What is the distance between the plane and the arch?

b) What is the distance between a point on the ground directly below the plane and the arch?  
(along the ground)

13. A man is lying on the beach, flying a kite. He holds the end of the kite string at ground level and estimates the angle of elevation of the kite to be  $50^\circ$ . If the string is 450 feet long, how high is the kite above the ground?

