Name: _____

7.10 ~ Applications w/Oblique △s

Past due on: _____ Period: _____

Use the Law of Sines, the Law or Cosines, or right triangle trig to solve each problem. Show work on a separate sheet of paper.

1. Redwood trees in California's Redwood National Park are hundreds of feet tall. The height of one of these trees is represented by h in the figure shown.

    a. Use the measurements shown to find a, to the nearest tenth of a foot.

   b. Find the height of a typical redwood tree to the nearest tenth of a foot.
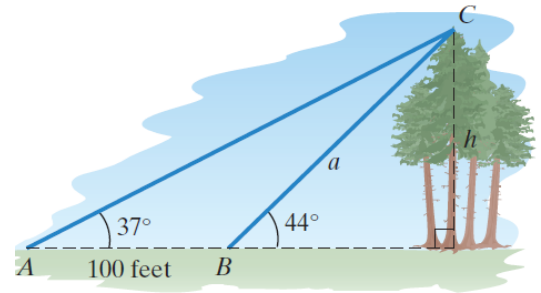
2. Sully is flying a small plane due west. To avoid the jet stream, he must change his course. He turns the plane 27° to the south and flies 60 miles. Then he makes a turn of 124° and heads back to his original course. How many miles did Sully add to the flight by changing course?
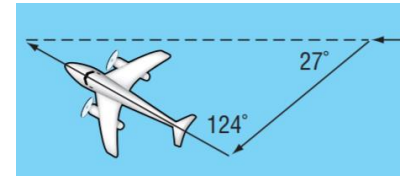
3. The figure shows a cable car that carries passengers from A to C. Point A is 1.6 miles from the base of the mountain. The angles of elevation from A and B to the mountain's peak are 22° and 66°, respectively.

    a. Determine, to the nearest tenth of a mile, the distance covered by the cable car.

    b. Find the height of the mountain to the nearest tenth of a mile.
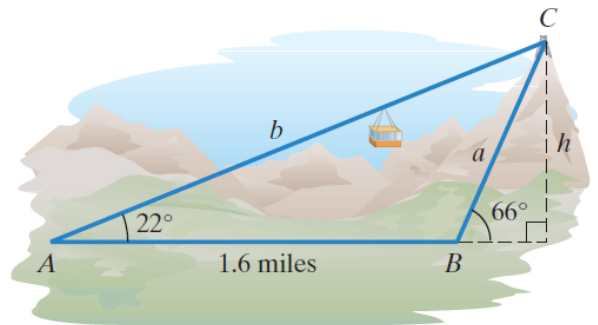
4. Two meteorologists are 25 miles apart located on an east-west road. The meteorologist at point A sights a tornado 38° east of north. The meteorologist at point B sights the same tornado at 53° west of north.

    a. Which meteorologist is closest to the tornado? How far away is he?

   b. Find the distance between the tornado and the road.
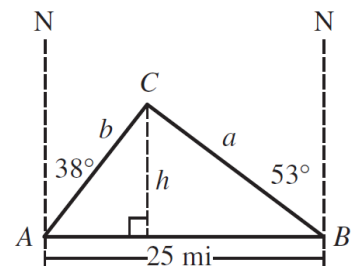
5. Two lighthouses *A* and *B* are known to be exactly 20 miles apart. A ship's captain at *S* measures ∠*ASB* to be 33°. A radio operator at *B* measures ∠*ABS* to be 52°. How far is the ship from lighthouse *B*?
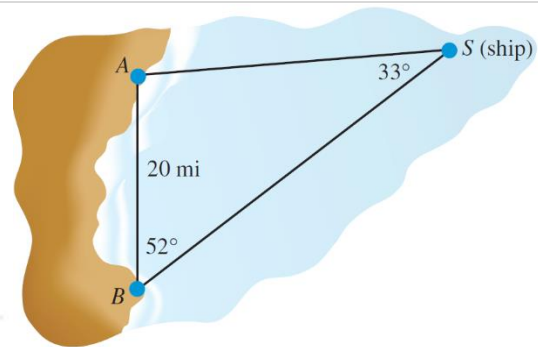
6. An airplane flies from Ft. Myers to Sarasota, a distance of 150 miles, and then turns through an angle of 50° (see the figure) and flies to Orlando, a distance of 100 miles.

   a. How far is it from Ft. Myers to Orlando?

   b. What is the angle between the routes <u>from</u> Orlando?
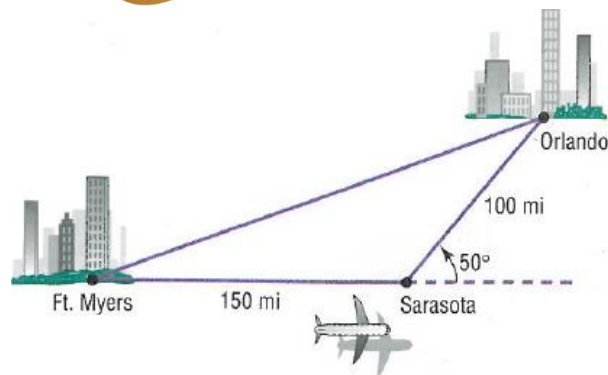
7. Because of prevailing winds, a tree grew so that it was leaning 4° from the vertical. At a point 35 meters from the tree, the angle of elevation to the top of the tree is 23°. Find the height, *h*, of the tree.
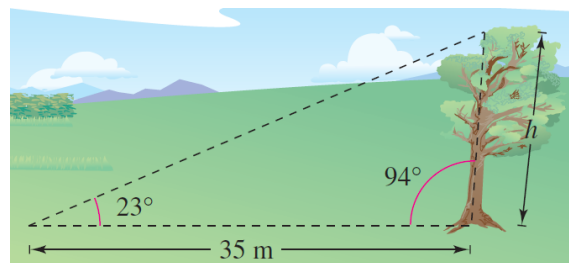
8. A bridge is to be built across a small lake from a gazebo to a dock. The bearing from the gazebo to the dock is S 41° W (see figure). From a tree 100 meters from the gazebo, the bearings to the gazebo and the dock are S 74° E and S 28° E, respectively. Find the distance from the gazebo to the dock.
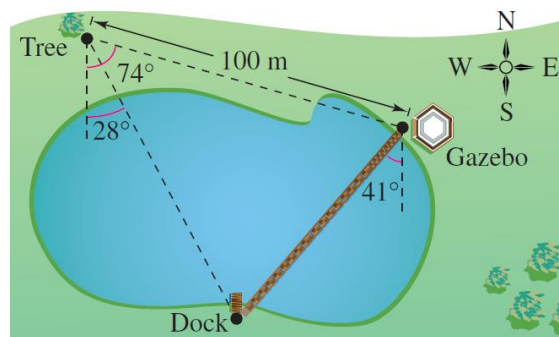
9. The highest bridge in the world is the bridge over the Royal Gorge of the Arkansas River in Colorado. Sightings to the same point at water level directly under the bridge are taken from each side of the 880-foot-long bridge, as indicated in the figure. How high is the bridge?

Chapter 7: Right Triangles & Trigonometry