

## 6.6 Applications Day 1

Name Key

Draw a picture. Set up the problem using the Law of Sines, and solve. Show all work. Round all answers to the nearest hundredth.

1. A surveyor marks points A and B 200 meters apart on one bank of a river. She sights a point C on the opposite bank and determines  $\angle A = 57^\circ$  and  $\angle B = 42^\circ$ . What is the distance from A to C?

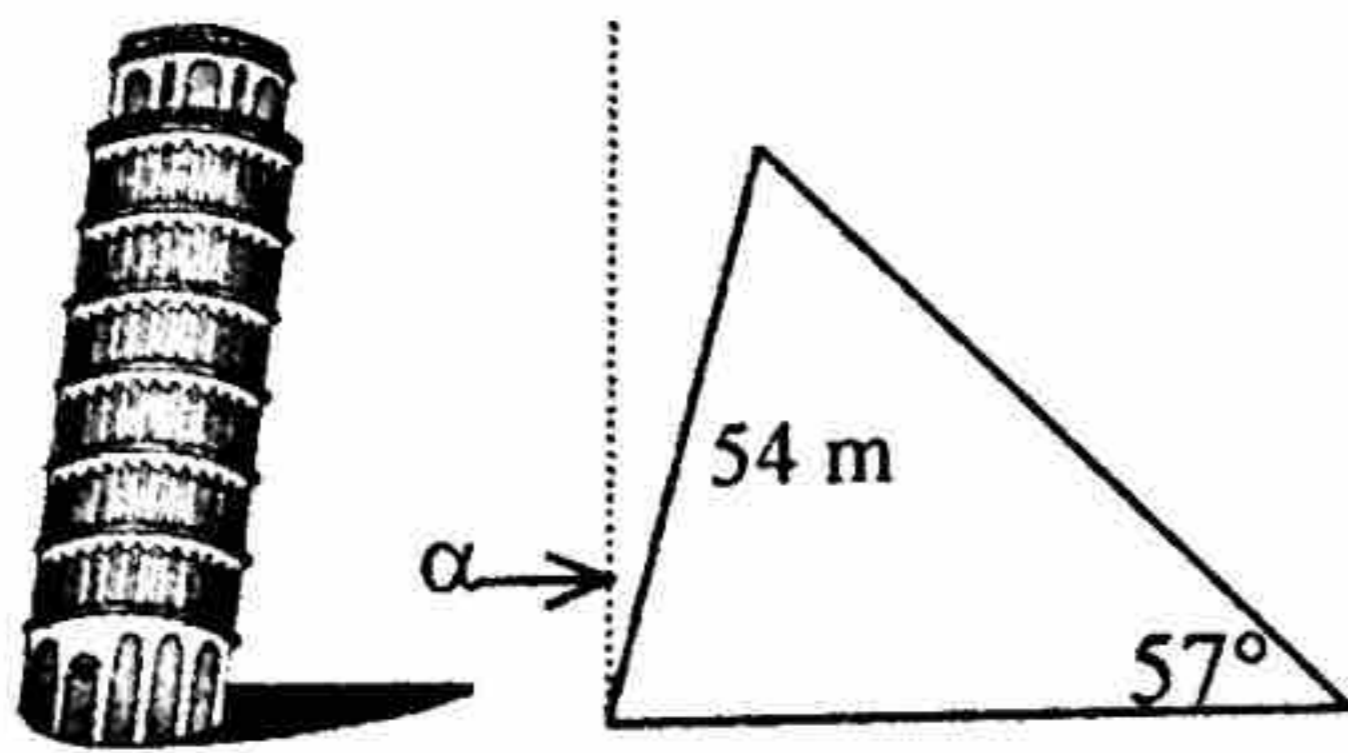
135.49m

2. A forest fire is spotted from two fire towers. The triangle determined by the two towers and the fire has angles of  $28^\circ$  and  $37^\circ$  at the tower vertices. If the towers are 3000 meters apart, which one is closer to the fire?

TOWER 1

3. A visitor to the Leaning Tower of Pisa observed that the tower's shadow was 40 meters long and the angle of elevation from the tip of the shadow to the top of the tower was  $57^\circ$ . The tower is now 54 meters tall (measured from the ground to the top along the center line of the tower). Approximate the angle  $\alpha$  that the center line of the tower makes with the vertical line.

5.41°



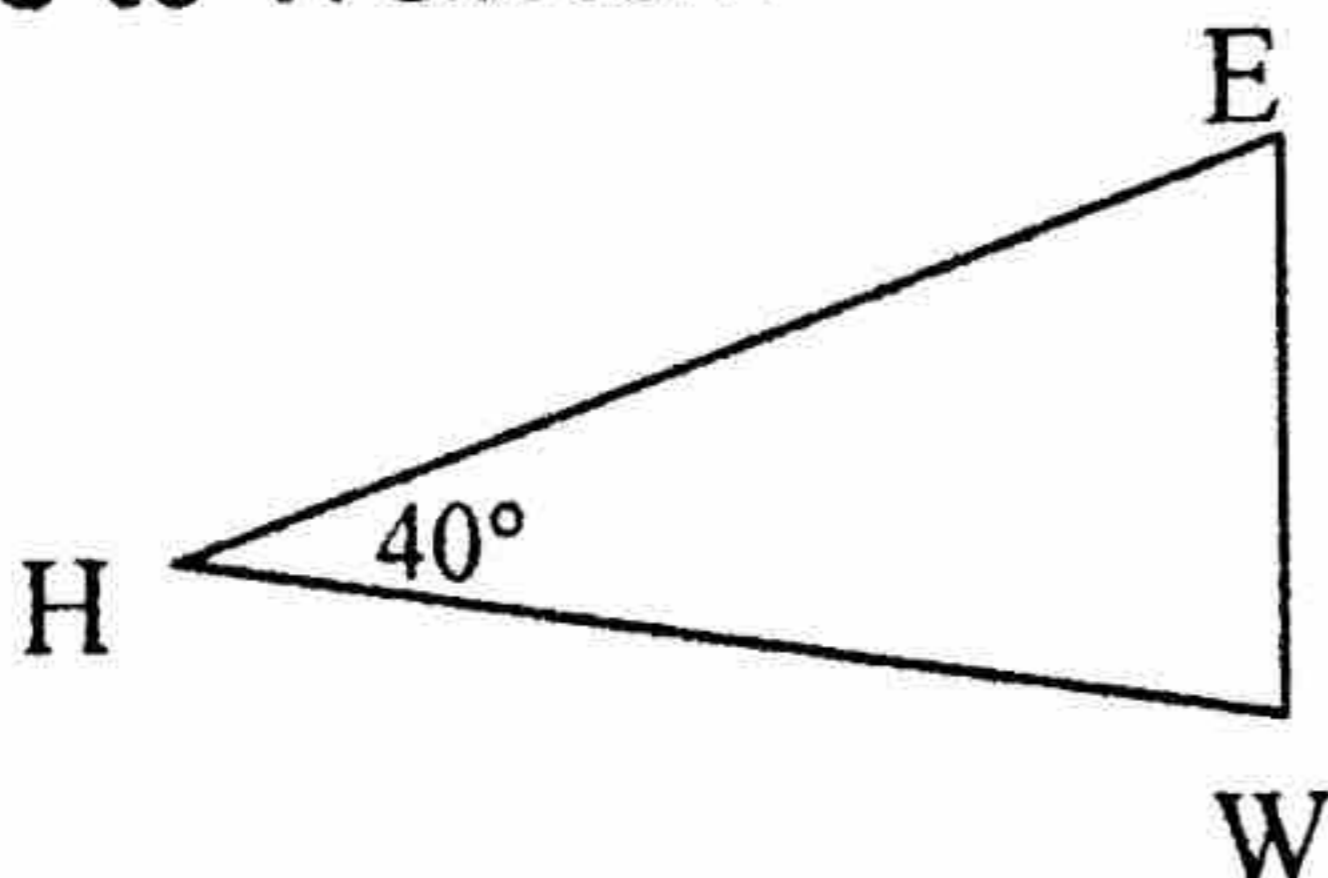
4. An airplane (A) takes off from a carrier (C) and flies in a straight line for 12 kilometers. At that instant, an observer on destroyer D, located 5 kilometers from the carrier, notes that the angle determined by the carrier, destroyer and the plane ( $\angle CDA$ ) is  $37^\circ$ . How far is the plane from the destroyer?

15.71 km

5. A plane flying in a straight line passes directly over point A on the ground and later directly over point B, which is 3 miles from A. A few minutes after the plane passes over B, the angle of elevation from A to the plane is  $43^\circ$  and the angle of elevation from B to the plane is  $67^\circ$ . How high is the plane at that moment?

4.63 mi

6. Two straight roads meet an angle of  $40^\circ$  in Harville, one leading to Eastview and the other to Wellston. Eastview is 18 miles from Harville and 20 miles from Wellston. What is the distance from Harville to Wellston?



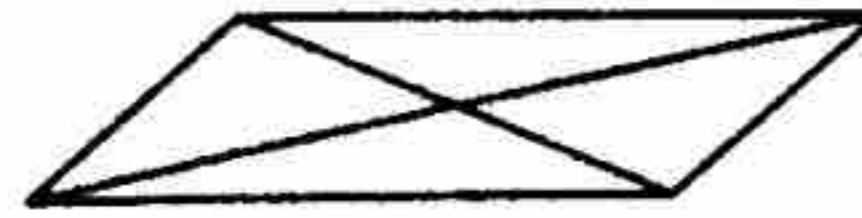
30.09 mi

**6.7 Oblique Triangle Word Problems**

Name KEY

1. The diagonals of a parallelogram are 88 cm and 66 cm. The shorter side is 20 cm. Find the acute angle formed by the two diagonals. {nearest tenth}

25.3°



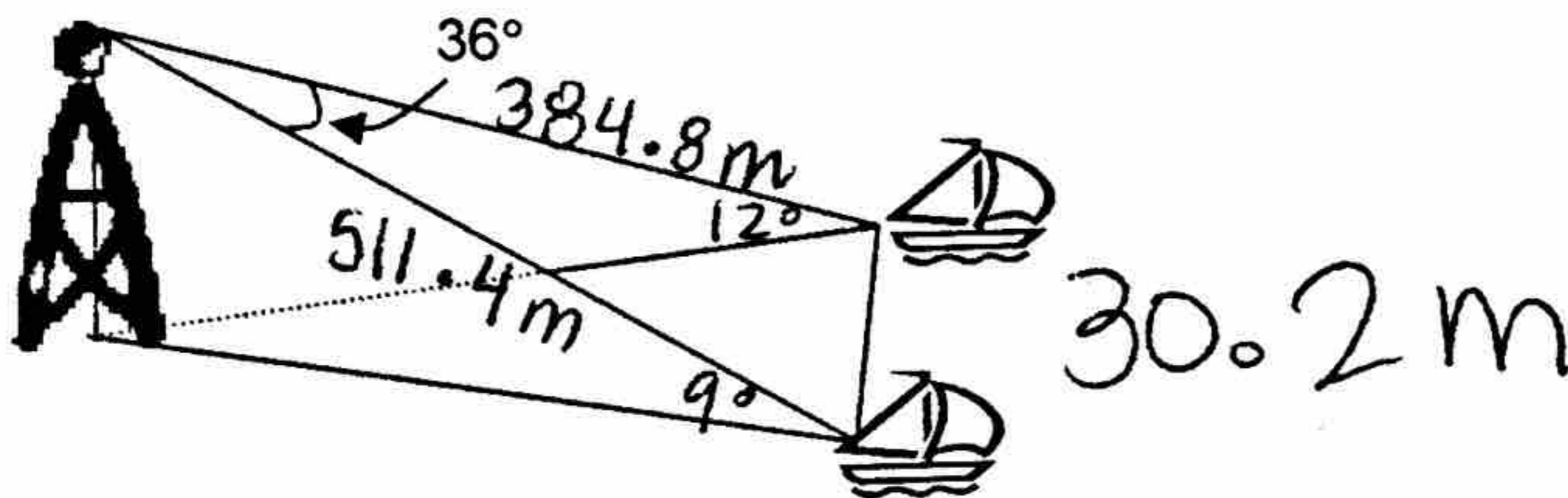
2. Maria hears the 4:00 pm whistle of Wilson Industries at 4:10, and she hears the 4:00 whistle of Ramos Manufacturing at 4:18. If the angle between Maria's lines of sight to the two plants is 56°, how far apart are they? (The speed of sound is 340 m/s.) {nearest 10<sup>th</sup>}

304,425.5m (304.4 km)

3. A guy wire bracing a transmission tower is 20 meters long and makes an angle of 50° with the ground. It is to be replaced by a 30 meter wire starting from the same point on the ground. How much farther up the tower will the new wire reach? {nearest 10<sup>th</sup>}

12.1m

4. From the top of a tower 80 meters above sea level, an observer sights a sailboat at an angle of depression of 9°. Turning in a different direction, he sights another sailboat at an angle of depression of 12°. The angle between the two lines of sight is 36°. How far apart are the boats? {nearest 10<sup>th</sup>} *separate the triangles!*



5. A pilot of a transoceanic jet flying at an altitude of 11,500 m finds that a stationary ship is in the same vertical plane as the jet's course. He measures the ship's angle of depression to be 16°. Two minutes later he finds it to be 46°. Find the speed of the jet. {nearest 10<sup>th</sup>}

14,500m/min OR 241.7m/s

6. A vertical tower stands at the top of a hill which is inclined 16° to the horizontal. At a point 95 feet down the hill, an observer finds the angle of elevation to the top of the tower to be 54°. How tall is the tower? {nearest 10<sup>th</sup>}

99.5 feet

