Name:_____

Law of Sines and Cosines Word Problems

1. The diagonals of a parallelogram are 56 inches and 34 inches and intersect at an angle of 120°. Find the length of the shorter side of the parallelogram.

2. Two planes leave an airport at the same time. Their speeds are 130 mph and 150 mph with the angle between their courses being 36°. How far apart are they after 1.5 hours of flying?

3. A man is flying in a hot air balloon in a straight horizontal line at a constant rate of 5 ft per second, while keeping it at a constant altitude. As he approaches the parking lot of a market, he notices that the angle of depression from his balloon to a friend's car in the parking lot is 35°. A minute and a half later, after flying directly over this friend's car (now he is on the other side of the car), he looks back to see his friend getting into the car and observes the angle of depression to be 36°. At that time, what is the distance between him and his friend?

4. A hot-air balloon is held at a constant altitude by two ropes that are anchored to the ground. One rope is 120 feet long and makes an angle of 65° with the ground. The other rope is 115 feet long. What is the distance between the points on the ground at which the ropes are attached?

5. A person standing on the street looks up to the top of a building and finds that the angle of elevation is 38°. She then walks one block further away (440 feet) and finds that the angle of elevation to the top of the building is now 28°. How far away from the building is she when makes her second observation?

6. Two ships leave the harbor at the same time. One ship is traveling at 14 miles per hour on a course with bearing of S 13° W, while the other is traveling at 12 mph on a course with a bearing of N 75° E. How far apart are they after 3 hours? (Reminder, bearing is an angle formed with the North/South line).