Chapter 3: Trigonometry

3.10 Ambiguous Word Problems

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\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}
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**Example #1:** Evan and Patrick are part of a team that is studying weather patterns. The team is about to launch a weather balloon to collect data. Evan’s rope is 7.8 metres long and makes an angle of 36 degrees with the ground. Patrick’s rope is 5.9 metres long. Assuming that Evan and Patrick form a triangle in a vertical plane with the weather balloon, what is the distance between Evan and Patrick, to the nearest tenth of a metre?
Example #2: Haley and Brooklyn are hiking in the mountains. They left the parking lot and walked northwest for 12.4km to a campsite. Then they turned due south and walked another 7.0 km to a glacier lake. They started to hear thunder, so they decided to go straight back to the parking lot. Haley remembered looking at the map in the parking lot and estimated the angle between the path to the campsite and the path to the glacier lake measured about 30 degrees. What direction should they follow to get back to the parking lot?
Assignment:

Textbook: p.183 #6,10,11,13

6) A landowner claims that his property is triangular, with one side that is 430m long and another side that is 110m long. The angle that is opposite one of these sides measures 35°. Determine the length of the third side of the property, to the nearest metre.

10) A farmer finishes repairing a fence post and then walks 250 yds through his corn field. He turns and walks another 300 yd east, until he can see the fence post southwest of him. He realizes that he left some of his tools at the fence post and heads directly back to it. How far does he need to walk, to the nearest meter?
11) In an extreme adventure triathlon, participants swim 1.7 km from a dock to one end of an island, run 1.5 km sue north along the length of the island, and then kayak back to the dock. From the dock, the angle between the lines of sight to the ends of the island measures $15^0$. How long is the kayak leg of the race?

13) The Huqiu Tower in China was built in 961 CE. When the tower was first built, its height was 47 m. Since then, it has tilted by $2.8^0$. It is now called China’s leaning Tower. There is a point on the ground where you can be equidistant from both the top and the bottom of the tower. How far is this point form the base of the tower? Round your answer to the nearest metre.
Practice Quiz

The *Raven’s Song*, a traditional Tsmishian cedar canoe, is paddles away from a dock, directly toward a navigational buoy that is 5 km away. After reaching the buoy, the direction of the canoe is altered and it is paddles another 3km. From the dock, the angle between the buoy and the canoe’s current position measures $12^0$. How far is the *Raven’s Song* from the dock?

Answer
either 2.1 km or 7.7 km depending on the direction the canoe turned.