

# Law of Sines and Cosines Word Problems

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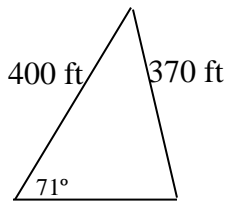
1. Juan and Romella are standing at the seashore 10 miles apart. The coastline is a straight line between them. Both can see the same ship in the water. The angle between the coastline and the line between the ship and Juan is 35 degrees. The angle between the coastline and the line between the ship and Romella is 45 degrees. How far is the ship from Juan? What area is covered between the people and ship?
2. Jack is on one side of a 200-foot-wide canyon and Jill is on the other. Jack and Jill can both see the trail guide at an angle of depression of 60 degrees. How far are they from the trail guide?
3. Tom, Dick, and Harry are camping in their tents. If the distance between Tom and Dick is 153 feet, the distance between Tom and Harry is 201 feet, and the distance between Dick and Harry is 175 feet, what is the angle between Dick, Harry, and Tom? Then find the area.
4. Three boats are at sea: Jenny one (J1), Jenny two (J2), and Jenny three (J3). The crew of J1 can see both J2 and J3. The angle between the line of sight to J2 and the line of sight to J3 is 45 degrees. If the distance between J1 and J2 is 2 miles and the distance between J1 and J3 is 4 miles, what is the distance between J2 and J3?
5. Airplane A is flying directly toward the airport which is 20 miles away. The pilot notices airplane B 45 degrees to her right. Airplane B is also flying directly toward the airport. The pilot of airplane B calculates that airplane A is 50 degrees to his left. Based on that information, how far is airplane B from the airport?
6. Flights 104 and 217 are both approaching O'Hare International Airport from directions directly opposite one another and at an altitude of 2.5 miles. The pilot on flight 104 reports an angle of depression of  $17^\circ$  to the tower, and the pilot on flight 217 reports an angle of depression of  $12^\circ$  to the tower. Calculate the distance between the planes.

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7. Matt measures the angle of elevation of the peak of a mountain as  $35^\circ$ . Susie, who is 1200 feet closer on a straight level path, measures the angle of elevation as  $42^\circ$ . How high is the mountain?
8. A triangular playground has sides of lengths 475 feet, 595 feet, and 401 feet. What are the measures of the angles between the sides, to the nearest tenth of a degree?

9. A real estate agent has just take a trigonometry class at the local community college. She is considering purchasing a piece of property and is waiting for the surveyor's report before closing the deal. If the surveyor submits a drawing as in the figure below, explain why the agent will reject the sale.



10. The surveyor admits to his mistake and revises his drawing as in the next figure. This time the real estate agent refuses to complete the deal until additional information is supplied. What additional information is the real estate agent looking for to complete her knowledge about the parcel of land? Then find the area.

