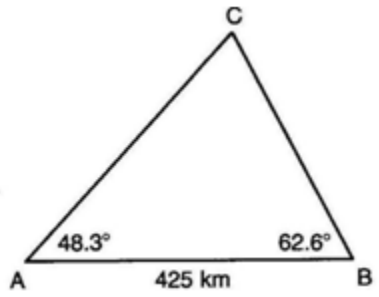
First name: _____ Last name: _____ Student ID: _____

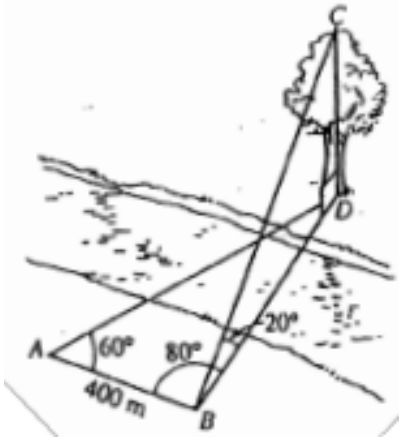
Chapter 6 Trigonometry 3 Homework

1. A boat leaves Oakville and heads due east for 5 km. At the same time, a second boat travels in a direction S60ºE from Oakville for 4 km. How far apart are the boats when they reach their respective destinations?

2. From two tracking stations 425 km apart, a satellite is sighted at C above AB, making $\angle CAB = 48.3^{\circ}$ and $\angle CBA = 62.6^{\circ}$. Find the height of the satellite.



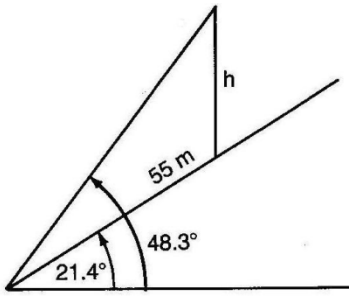
3. Chris wants to find the height of the tree that is at point D on the opposite side of a river. Chris makes the measurements shown on the diagram. What is the height of the tree, to the nearest metre?



4. From a balloon, the angle of depression of a ground marker is 27.8 °. From a point 345 m higher, the angle of depression is 46.2 °. Find the height of the balloon.

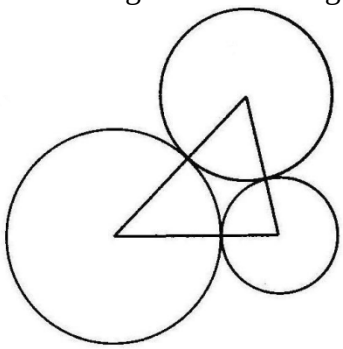
5. Two forest fire towers, A and B, are 20.3 km apart. The bearing from A to B is N70°E. The ranger in each tower observes a fire and radios the fire's bearing from the tower. The bearing from tower A is N25°E. From Tower B, the bearing is N15°W. How far is the fire from each tower?

6. A light pole on a hillside casts a shadow of 55 m down the hill. If the angle of elevation of the sun is 48.3° and the angle of inclination of the hill is 21.4°, find the height of the pole.



7. Two aircraft have radio equipment with a range of 350 km. The distances and bearings from a radio beacon are 245 km on a bearing 228° for one aircraft, and 200 km on a bearing 140° for the other. Can the two aircraft make radio contact?

8. Three circles with radii 35 cm, 50 cm, and 65 cm respectively are tangent to each other externally. Find the angles of the triangle formed by joining the centers of the circles.



9. Two aircraft leave Mirabel Airport at approximately the same time flying at 750 km/h and 850 km/h. After 2.5 h, they are 1900 km apart. Find the angle between their flight paths.

10. Two boasts leave the same port at the same time. One travels at a speed of 30 miles per hour in the direction N50^{o}E and the other travels at a speed of 26 miles per hour in a direction S70^{o}E. How far apart are the two boats after one hour?

11. In ABC, $\angle A = 74^{o}$, $a = 59.2$, and $c = 60.3$. Solve the triangle.

12. How many distinct triangles can be constructed if $\angle A = 30^o$, side $a = 34$, and side $b = 12$?

13. Sam needs to cut a triangle out of a sheet of paper. The only requirements that Sam must follow are that one of the angles must be 60°, the side opposite the 60° angle must be 40 centimeters, and one of the other sides must be 15 centimeters. How many different triangles can Sam make?

14. A fisherman leaves his home port and heads in the direction N 70°W. He travels 30 mi and reaches Egg Island. The next day he sails N10°E for 50 mi, reaching Forrest Island.

a) Find the distance between the fisherman's home port and Forrest Island.

b) Find the bearing from Forrest Island back to his home port.