

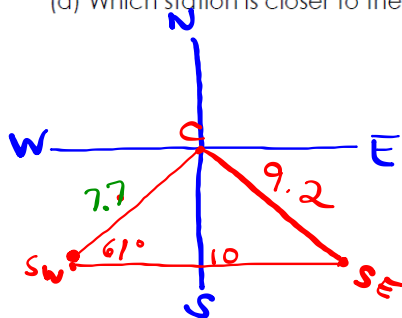
Applications Process

1. Try it on your own.
2. Solve and check your answer.
3. Not right? Check your math.
4. Still not right? Re-read the problem and reconsider your setup. Solve using the new setup. Discuss with a classmate.
5. Still not working? Go to the front board (or blog) and see how I set it up. Then solve using my setup.

Take out a blank sheet of paper. You will be turning in p.13-14.

2nd Bk: By the end of class tomorrow, 4th Bk- Beginning of class on Monday.

1. Two ranger stations ^{are} located 10 km apart on the southwest and southeast corners of a national park. They receive a distress call from a camper. Electronic equipment allows SW ranger to determine that the camper is at a location that makes an angle of 61° with the southern boundary. Another beacon allows the SE ranger see that the camper is 9.2 km to the northwest of his position.
- (a) Which station is closer to the camper? (b) What is the difference in the distances?

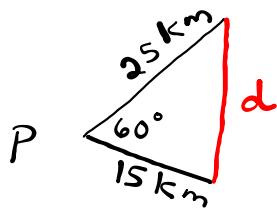


The SW station is closer to the camper be 1.5 km.

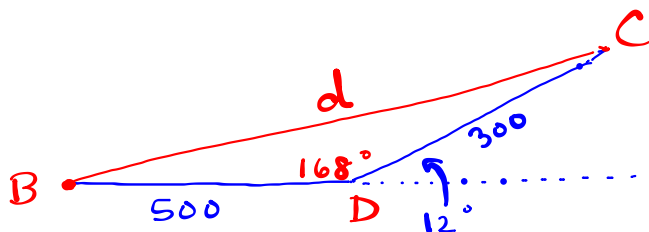
① $\frac{10}{\sin C} = \frac{9.2}{\sin 61^\circ}$
 $\sin C = \frac{10 \sin 61^\circ}{9.2}$
 $C = 71.9^\circ$

② $\frac{e}{\sin 47.1^\circ} = \frac{9.2}{\sin 61^\circ}$
 $e = \frac{9.2 \sin 47.1^\circ}{\sin 61^\circ}$
 $e = 7.7 \text{ Km}$

2. Ships A and B leave port at the same time and sail on straight paths making an angle of 60° with each other. How far apart are the ships at the end of 1 hour if the speed of ship A is 25 km/h and that of ship B is 15 km/h?



3. A plane flies 500 miles on a straight path. The plane then turns left 12 degrees on a new heading and goes another 300 miles. How far is the plane from its original location?



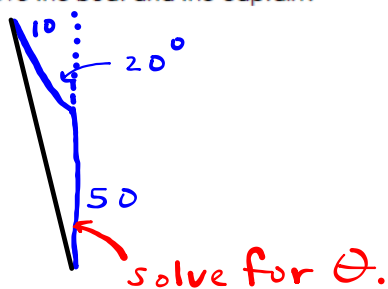
$$d^2 = 500^2 + 300^2 - 2(500)(300)\cos 168^\circ$$

$$d = \sqrt{ANS}$$

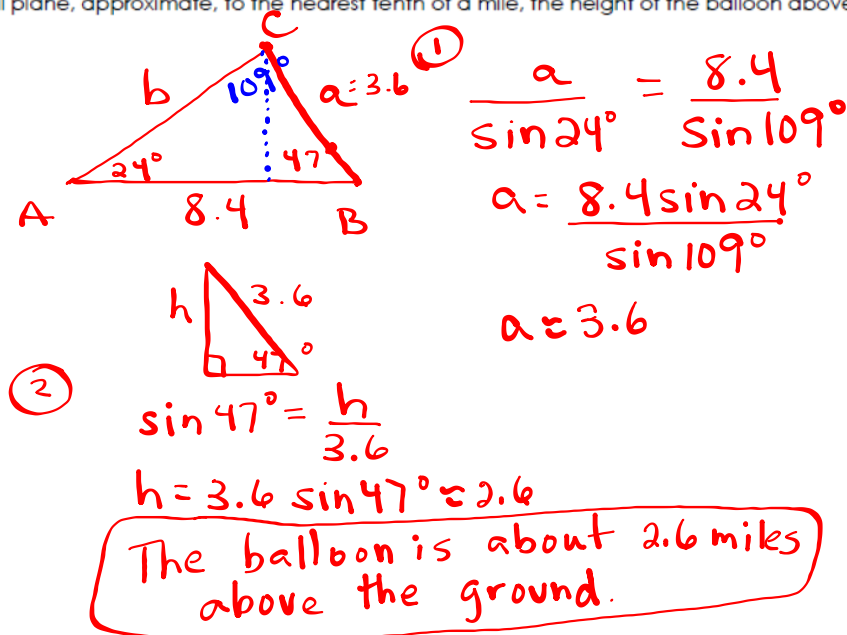
$$d \approx 795.9$$

The plane is 795.9 miles from its original location.

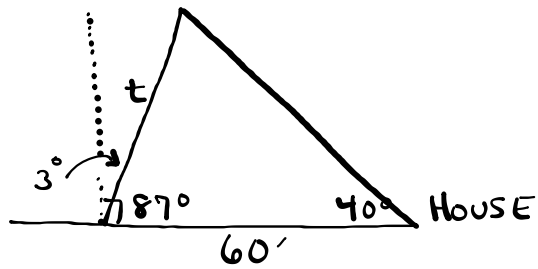
4. A boat leaves a pier heading due north for 50 miles. The captain then turns 20° toward the west and goes another 10 miles. At this point the boat breaks down. What angle (from north) does the harbor need to send a tug boat to retrieve the boat and the captain?



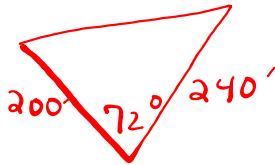
5. The angles of elevation of a balloon from the two points A and B on level ground are 24° and 47° respectively. If points A and B are 8.4 miles apart and the balloon is between the points, in the same vertical plane, approximate, to the nearest tenth of a mile, the height of the balloon above the ground.



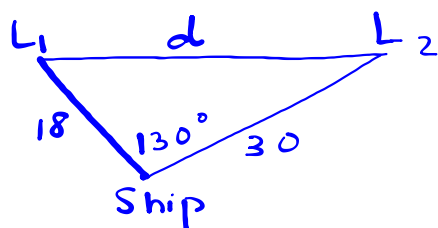
6. After a storm, a tree is leaning 3° from vertical toward the front of a house. A person standing on the front porch notices that the angle of elevation to the top of the tree is 40° . If the house is 60 feet from the base of the tree, how tall is the tree?



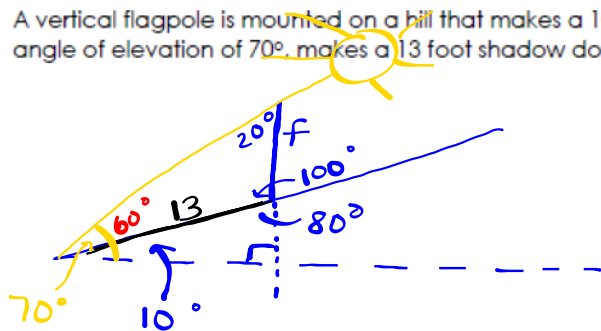
7. A vacant lot between two streets is shaped like a triangle such that the streets intersect at a 72° angle. If the sides of the lot that face these streets is 200 ft and 240 ft long. What area of the lot?



8. A ship in the bay is 18 miles from one lighthouse and 30 miles from another. What is the distance between lighthouses if the measure of the angle formed by the line of sight to the lighthouse is 130° ?



9. A vertical flagpole is mounted on a hill that makes a 10° angle with the horizontal. If the sun, shining at an angle of elevation of 70° , makes a 13 foot shadow down the hill, how tall is the flagpole?



$$\frac{f}{\sin 60^\circ} = \frac{13}{\sin 20^\circ}$$

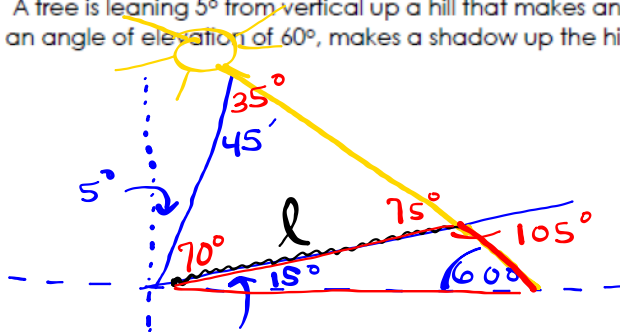
$$f = \frac{13 \sin 60^\circ}{\sin 20^\circ}$$

$$f = 32.9$$

The flagpole is 32.9 feet tall.

*Application directions next page.

10. A tree is leaning 5° from vertical up a hill that makes an angle of 15° with the horizontal. The sun, shining at an angle of elevation of 60° , makes a shadow up the hill. If the tree is 45 feet tall, how long is the shadow?



$$\frac{l}{\sin 35^\circ} = \frac{45}{\sin 75^\circ}$$

$$l = \frac{45 \sin 35^\circ}{\sin 75^\circ}$$

$$l \approx 26.7$$

The length of the shadow is
26.7 ft.