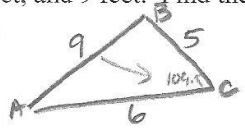


Draw a picture and solve.

1. A piece of sheet metal is to be cut using a blowtorch so that it forms a triangle with the side lengths of 6 feet, 5 feet, and 9 feet. Find the measures of the angles.

$$\frac{\sin 109.5}{9} = \frac{\sin B}{6}$$



$$9^2 = 5^2 + 6^2 - 2(5)(6)\cos C$$

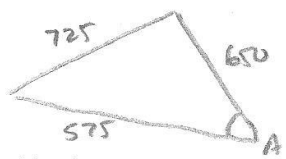
$$81 = 61 - 60\cos C$$

$$20 = -60\cos C$$

$$C = 109.5$$

$A = 31.6$
 $B = 38.9$
 $C = 109.5$

2. A triangular parcel of ground has sides of lengths 725 feet, 650 feet, 575 feet. Find the measure of the largest angle.



$$725^2 = 650^2 + 575^2 - 2(650)(575)\cos A$$

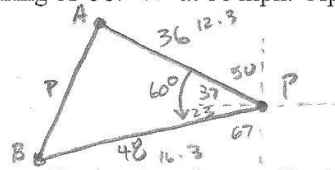
$$-227500 = -747500\cos A$$

$$.30434 = \cos A$$

$$A = 72.3^\circ$$

72.3°

4. Two ships leave a port at 9:00AM. One travels at a bearing of N53°W at 12 mph and the other travels at a bearing of S67°W at 16 mph. Approximate how far apart they are at noon that day.



$$p^2 = 36^2 + 48^2 - 2(36)(48)\cos 60$$

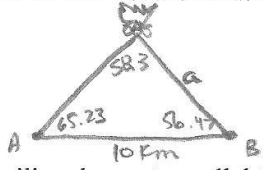
$$p^2 = 1872$$

$$p = 43.3$$

43.3 miles

5. Two rangers, one at Station A and one at Station B, observe a fire in the forest. The angle at Station A formed by the lines of sight to Station B and to the fire is 65.23°. The angle at Station B formed by the lines of sight to Station A and to the fire is 56.47°. The stations are 10 km apart.

- a. How far from Station A is the fire? 9.8 km
 b. How far from Station B is the fire? 10.7 km



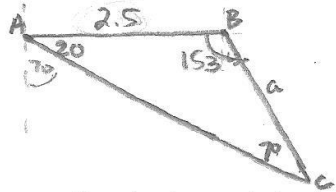
$$\frac{\sin 56.3}{10} = \frac{\sin 65.23}{a}$$

to station B

$$\frac{\sin 58.3}{10} = \frac{\sin 56.47}{b}$$

to station A

6. A boat is sailing due east parallel to the given shoreline at a speed of 10 mph. At a given time the bearing to the lighthouse is S70°E, and 15 minutes later the bearing is S63°E. Find the distance from the boat to the lighthouse.

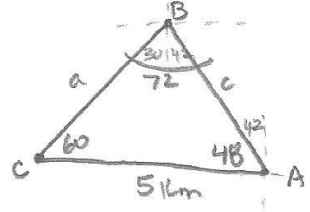


$$\frac{\sin 70}{2.5} = \frac{\sin 20}{a}$$

$$\frac{a \sin 70}{\sin 70} = \frac{2.5 \sin 20}{\sin 70}$$

7.02 miles

7. The course for a boat race starts at point A and proceeds in the direction N42°W to point B, then in the direction S30°W to point C, and finally back to A. Point C lies 5 km directly west of point A. Approximate the total distance of the race course.



$$\frac{\sin 72}{5} = \frac{\sin 48}{a}$$

$$a = 3.9$$

$$3.9 + 4.6 + 5 = 13.5$$

$$\frac{\sin 72}{5} = \frac{\sin 60}{c}$$

$$c = 4.6$$

13.5 km