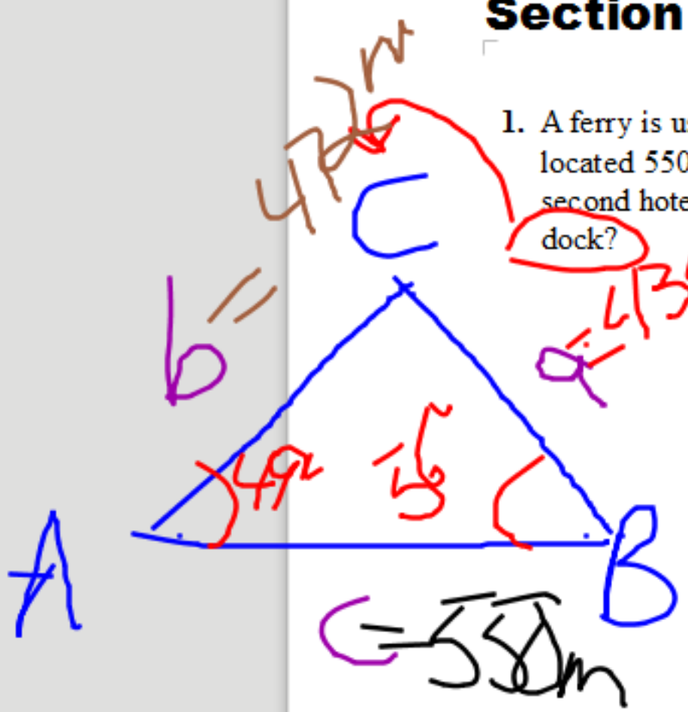
Name: _____ Date: _____ ...BLM 1-11

Section 1.5 Make Decisions Using Trigonometry

1. A ferry is used to transport guests from the dock to two hotels across a large lake. The hotels are located 550 m apart. The first hotel is at a 49° angle between the dock and the second hotel. The second hotel is at a 56° angle between the dock and the first hotel. How far is each hotel from the dock?



$$\frac{a}{\sin A} = \frac{c}{\sin C}$$

$$\frac{a}{\sin 49^\circ} = \frac{550}{\sin 75}$$

2. Jayveer and Seema are standing 325 m apart, watching a hot air balloon above them. Jayveer measures the angle of elevation to the balloon to be 54°. Seema measures the angle of elevation to the balloon to be 38°.
   a) How far is each person from the balloon, to the nearest metre?
   b) What is the height of the balloon, to the nearest metre?

$$\frac{a\sin 75^\circ}{\sin 75^\circ} = \frac{550\sin 49^\circ}{\sin 75^\circ}$$

$$a = 429.7 \Rightarrow 430\text{m}$$

3. From one end of a bridge above a railroad track, the angle of depression to the tracks is 37°. If that point is 112 m from the track and the bridge is 122 m long, how far from the other end of the bridge is the track, to the nearest metre?

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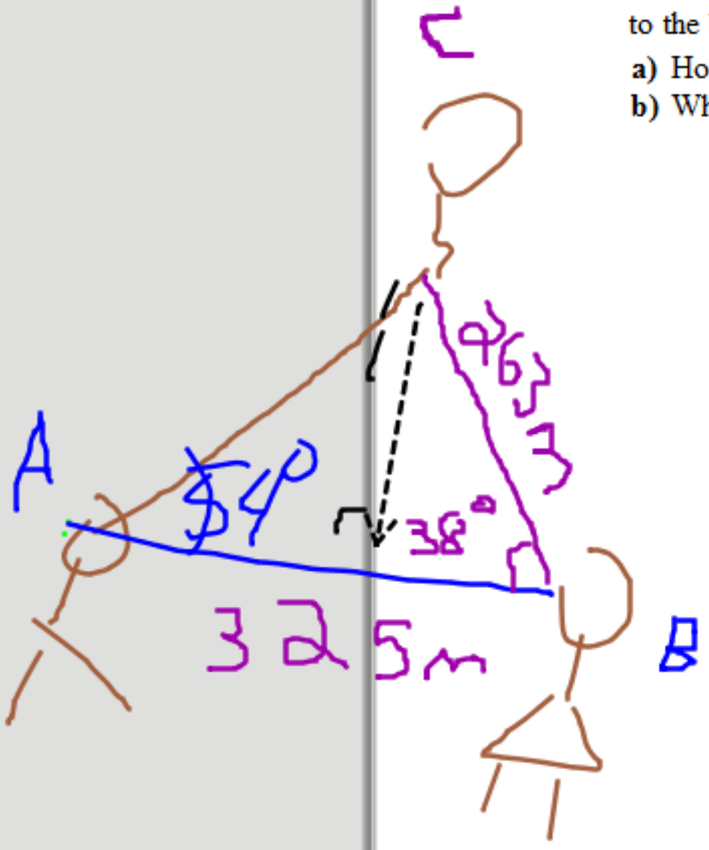

$\frac{a}{\sin A} = \frac{c}{\sin C}$

$\frac{a}{\sin 54} = \frac{325}{\sin 88}$

$\frac{a \sin 88}{\sin 88} = \frac{325 \sin 54}{\sin 88}$

$a = 263.1$

A = 54°
B = 38°
C = 88°

a = ab
b =
c = 325 m

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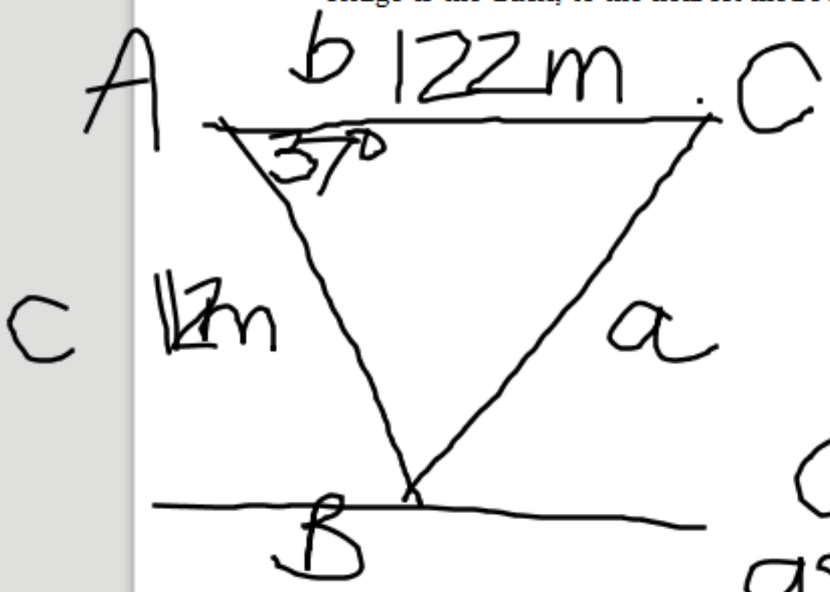

$\angle A = 37°$ $a = 75m$

$\angle B =$ $b = 122$

$\angle C =$ $c = 112$

$a^2 = b^2 + c^2 - 2bc(\cos A)$

$a^2 = 122^2 + 112^2 - 2(122)(112)(\cos 37°)$

$a^2 = 5602.8887$

$a = 74.85$

$a = 75m$

4. A funnel used to pour oil into an engine is in the shape of a cone. The sides of the cone are 15 cm long and the angle between the sides is 17.9°. What is the diameter of the cone?