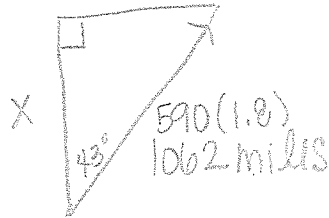


PREAP PRECALCULUS  
WS: BEARING

NAME Kty

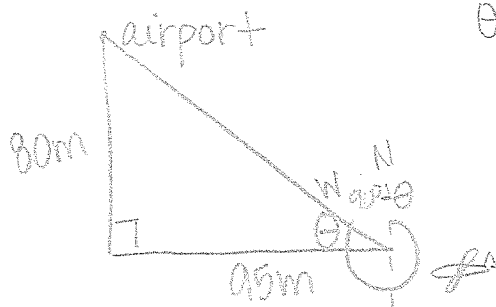
1. A jet is traveling at 590 miles per hour at a bearing of  $43^\circ$ . After flying for 1.8 hours in the same direction, how far north will the plane have traveled?  
(776.698 miles)



$$\cos 43^\circ = \frac{x}{1062}$$

$$x = 776.698 \text{ miles}$$

2. A plane is 80 miles south and 95 miles east of Cleveland Hopkins International Airport. What bearing should be taken to fly directly to the airport?  
( $310.101^\circ$ )



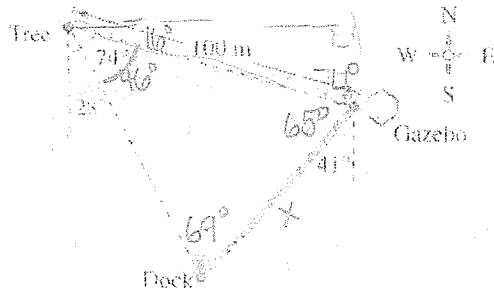
$$\theta + 270^\circ$$

$$\tan \theta = \frac{80}{95}$$

$$\theta = 40.101^\circ + 270^\circ$$

$$310.101^\circ \text{ or } N49.899^\circ W$$

3. A bridge is to be built across a small lake from a gazebo to a dock (see figure). The bearing from the gazebo to the dock is  $S 41^\circ W$ . From a tree 100 meters from the gazebo, the bearings to the gazebo and the dock are  $S 74^\circ E$  and  $S 28^\circ E$ , respectively. Find the distance from the gazebo to the dock.



(77.052 m)

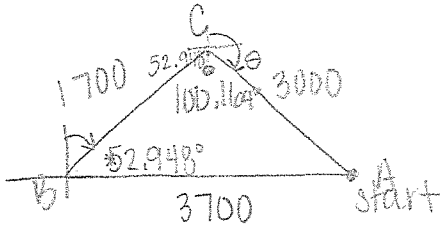
$$\frac{\sin 46^\circ}{x} = \frac{\sin 69^\circ}{100}$$

$$x = 77.052 \text{ m}$$

4. A boat race runs along a triangular course marked by buoys A, B, and C. The race starts with the boats headed west for 3700 meters. The other two sides of the course lie to the north of the first side, and their lengths are 1700 meters and 3000 meters. Draw a figure that gives a visual representation of the problem, and find the bearings for the last two legs of the race.

$$\theta = 180^\circ - 100.164^\circ - 52.948^\circ$$

$$\theta = 26.888^\circ$$



$$(N37.052^\circ E, S63.112^\circ E)$$

$$3700^2 = 1700^2 + 3000^2 - 2(1700)(3000)\cos C$$

$$C = 100.164^\circ$$

$$\frac{\sin 100.164^\circ}{3700} = \frac{\sin B}{3000}$$

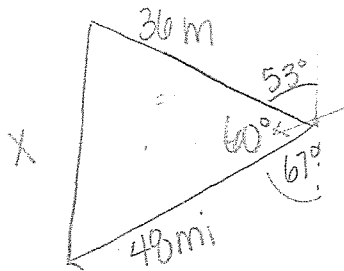
$$B = 52.948^\circ$$

- ①  $37.052^\circ$  B bearing  
 ②  $116.888^\circ$  C bearing

5. Two ships leave a port at 9 A.M. One travels at a bearing of N  $53^\circ$  W at 12 miles per hour, and the other travels at a bearing of S  $67^\circ$  W at 16 miles per hour. Approximate how far apart they are at noon that day.

$$(43.267 \text{ mi})$$

$$9 \text{ AM} - \text{noon} = 3 \text{ hr.}$$

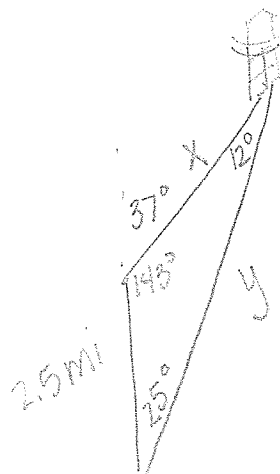


$$X^2 = 36^2 + 48^2 - 2(36)(48)\cos 60^\circ$$

$$X = 43.267 \text{ miles}$$

6. The bearing of a lighthouse from a ship was found to be N  $37^\circ$  E. After the ship sailed 2.5 miles due south, the new bearing was N  $25^\circ$  E. Find the distance between the ship and the lighthouse at each location.

$$(7.236 \text{ mi}, 5.082 \text{ mi})$$



$$\frac{\sin 12^\circ}{2.5} = \frac{\sin 143^\circ}{y} \quad y = 7.236 \text{ mi}$$

$$\frac{\sin 12^\circ}{2.5} = \frac{\sin 25^\circ}{X} \quad X = 5.082 \text{ mi}$$