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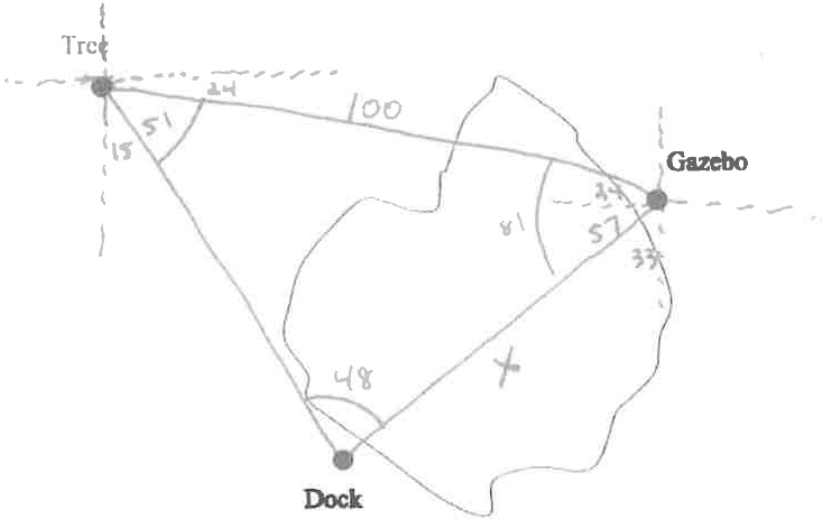
Lesson 3.[illegible] - Supplement

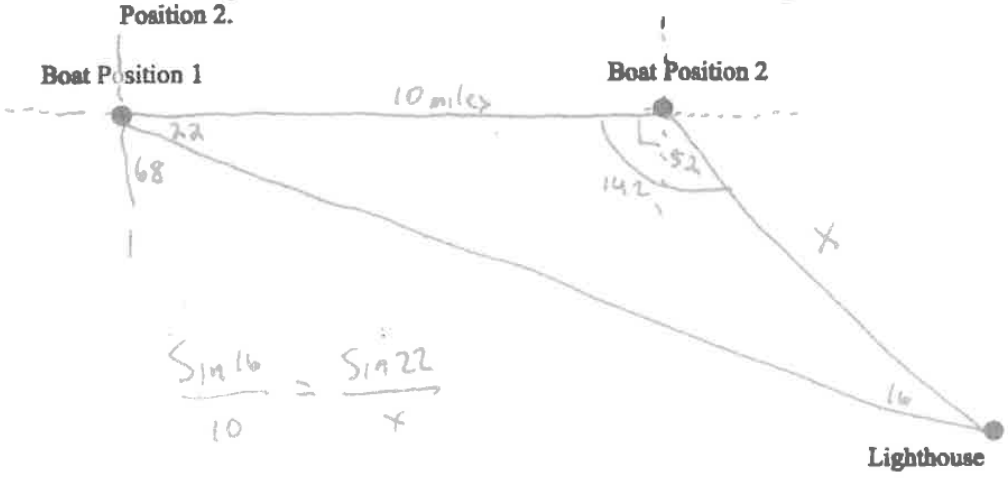
1. A footbridge is to be built across a small lake from a gazebo to a dock. From a tree 100 yards from the gazebo the bearing is E 24° S. From the tree to the dock the bearing is S 15° E. The bearing from the gazebo to the dock is S 33° W. What is the length of the bridge?



$\frac{\sin 48}{100} = \frac{\sin 51}{x}$

$x = 104.57$ ft

2. A boat is sailing due east parallel to the shoreline at a speed of 20 miles per hour. At a given time the, the bearing to a lighthouse is S 68° E, and 30 minutes later the bearing is S 52° E. Find the distance from the boat to the lighthouse at Boat Position 2.



$\frac{\sin 16}{10} = \frac{\sin 22}{x}$

$x = 13.8$ miles

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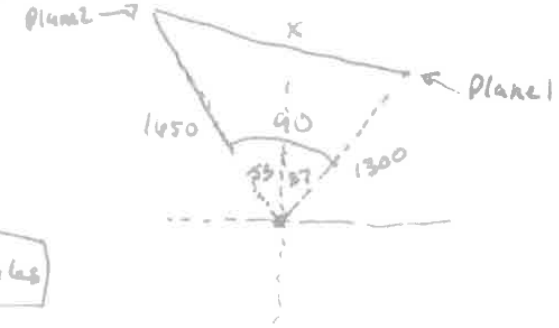
Lesson 3.11 - Supplement

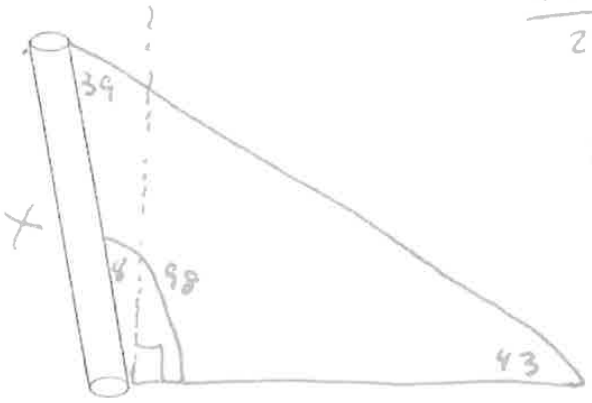
3. Two planes leave an airport at the same time. One plane is flying 650 m.p.h at a bearing N 37° E, and the other plane is flying at 825 m.p.h at a bearing of N 53° W. How far apart are the planes after flying for 2 hours?



$1300^2 + 1650^2 = x^2$

$x = 2100.6$ miles

4. A poll tilts towards the sun at an 8° angle from the vertical at it casts a 22-ft shadow. The angle of elevation from the shadow to the top of the pole is 43°. How tall is the poll?

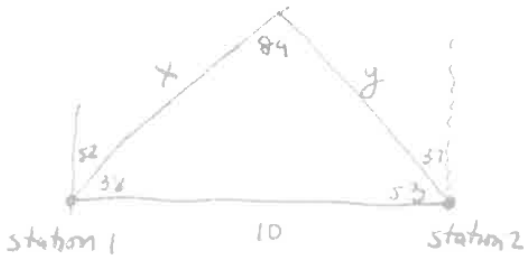


$\frac{\sin 39}{22} = \frac{\sin 43}{x}$

$x = 23.8$

22

6. **A fire is spotted from two lookout stations that are 10 miles apart. The bearing from the first lookout station to the fire is N 52° E. The bearing from the second lookout station to the fire is N 37° W. Find the distance from each lookout station to the fire.**



$\frac{\sin 84}{10} = \frac{\sin 53}{x}$

$x = 8$ miles

$\frac{\sin 84}{10} = \frac{\sin 38}{y}$

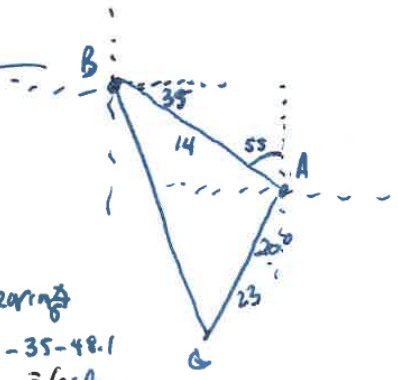
$y = 6.16$ miles

Lesson 3.10 - Supplement

7) The titanic is in the middle of the Atlantic ocean. If the ship travels 14 miles at a bearing of N 55° W it will hit an iceberg. If the ship travels 23 miles at a bearing of S 20° W it will hit a different iceberg. How far apart are the two icebergs? (round 2 decimal places) What is the bearing between the first iceberg and the second ice berg?

Distance between Icebergs is BC

Bearing from B to C



$\angle A = 35 + 70 = 105°$

$BC^2 = 14^2 + 23^2 - (2(14)(23)(\cos 105°))$

$BC^2 = 725 - (-188.29)$ 725 + 166.7

$BC^2 = 536.71$

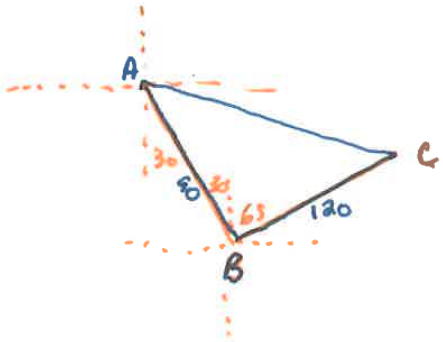
$BC = 21.17$ mi 29.86 mi

$\frac{\sin 105}{29.86} = \frac{\sin \angle B}{23}$

$\angle B = 48.1$ → Bearing $\angle$ 40 − 35 − 48.1 = 6.9

Bearing from B to C = S 6.9° E

8) The bearing from A to B is S 30° E, and the bearing from B to C is N 65° E. An automobile traveling at 60 mph needs 1.5 hr to go from A to B and 2 hr to go from B to C. Find the distance from A to C.



$AB = 90$

$BC = 120$

$\angle B = 95°$ (inside Δ)

$AC^2 = 90^2 + 120^2 - (2(90)(120)(\cos 95$

$AC^2 = 22500 + 1882.56$

$AC^2 = 24382.56$

$AC = 156.15$ mi