

#7C Area Triangles & Bearing

Find the area of each triangle. Show ALL work!!

Name Key

1. $A = \frac{1}{2}ab\sin C$

$A = \frac{1}{2}(8)(13)\sin 123$

$A = 43.6 \text{ km}^2$

2.

$A \approx 50.7 \text{ km}^2$

3. $K = \frac{1}{4}(s-a)(s-b)(s-c)$

$s = \frac{12+10+11}{2} = 16.5$

$K = \sqrt{\frac{1}{16}(16.5)(16.5-12)(16.5-10)(16.5-11)}$

$K = \sqrt{\frac{1}{16}(2654.4)} \approx 51.5 \text{ in}^2$

4.

$A \approx 54.6 \text{ m}^2$

5.

$\frac{\sin 21}{K} = \frac{\sin 16}{7}$

$A = \frac{1}{2}(7)(9.1)\sin(143)$

$K = \frac{7\sin 21}{\sin 16}$

$K \approx 9.1$

$A \approx 19.2 \text{ cm}^2$

6.

$A \approx 5.6 \text{ ft}^2$

Given the bearing, draw the figure and calculate the indicated measure.

7. A ship leaves port headed due East for 12.7 miles then takes a bearing of 130° for 18.3 miles. How far is the ship from port?

$x^2 = 12.7^2 + 18.3^2 - 2(12.7)(18.3)\cos 140$

$x^2 = 852.25$

$x \approx 29.2 \text{ miles}$

8. A ship leaves port headed due West for 87 miles then takes a bearing of 38° for 142 miles. How far is the ship from port?

$x \approx 111.9 \text{ miles}$

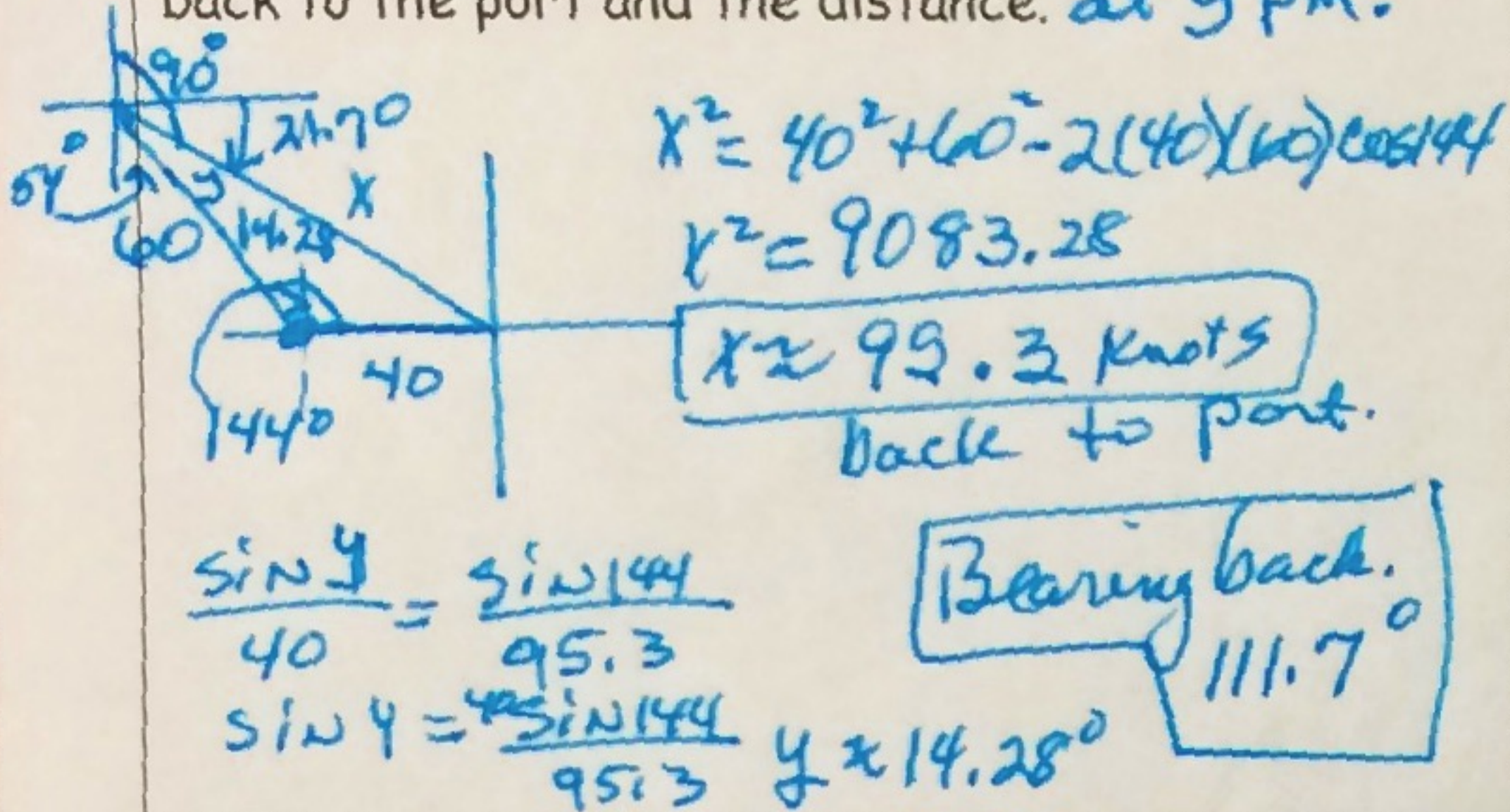
9. A rower leaves port on a bearing of 24° for 2.8 miles then takes a bearing of 140° for 3.1 miles. How far is the rower from port?

$x^2 = 2.8^2 + 3.1^2 - 2(2.8)(3.1)\cos 64^\circ$

$x^2 \approx 9.8$

$x \approx 3.1 \text{ mile}$

10. A boat leaves port at noon and heads due west at 20 knots per hour. At 2PM the boat changes course to bearing of 306°. Find the boats bearing back to the port and the distance. *at 5 pm.*



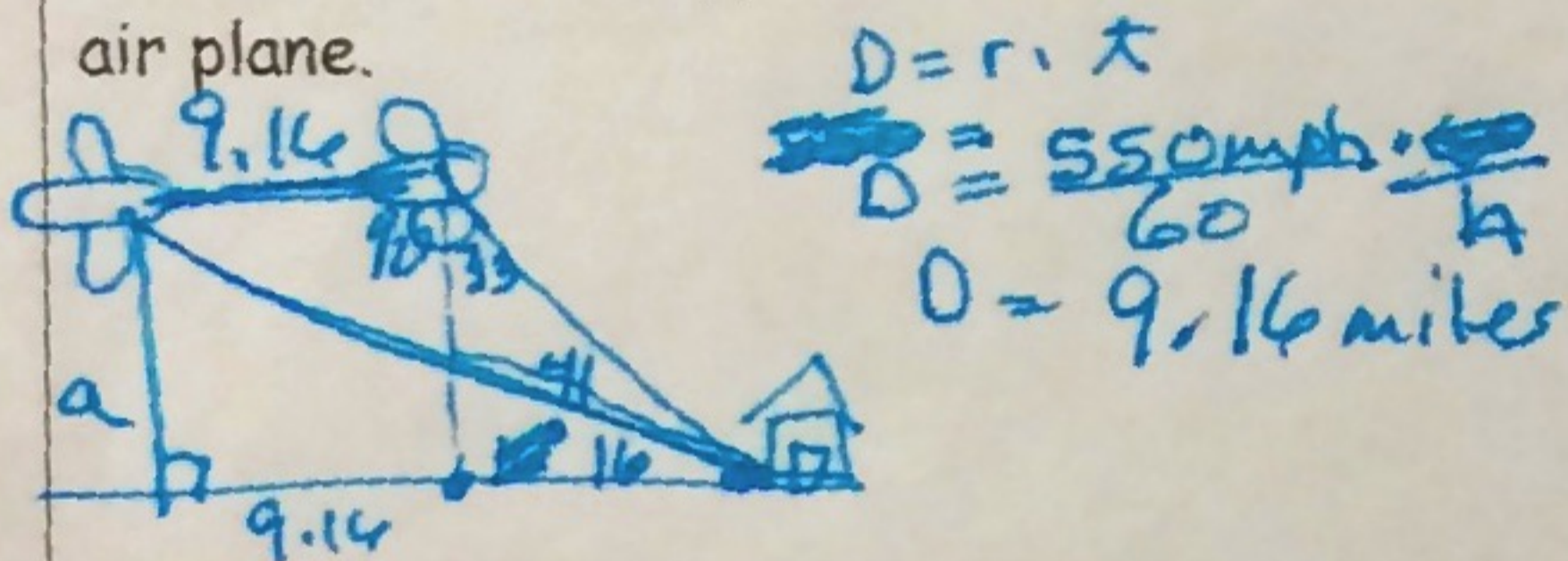
11. A jet leaves Reno, Nevada and is headed toward Miami, FL at a bearing of 100°. The distance between the two cities is about 2472 miles.

- A) How far NORTH and West is Reno from Miami?
 B) If the jet is to return directly to Reno from Miami, at what bearing should it travel?

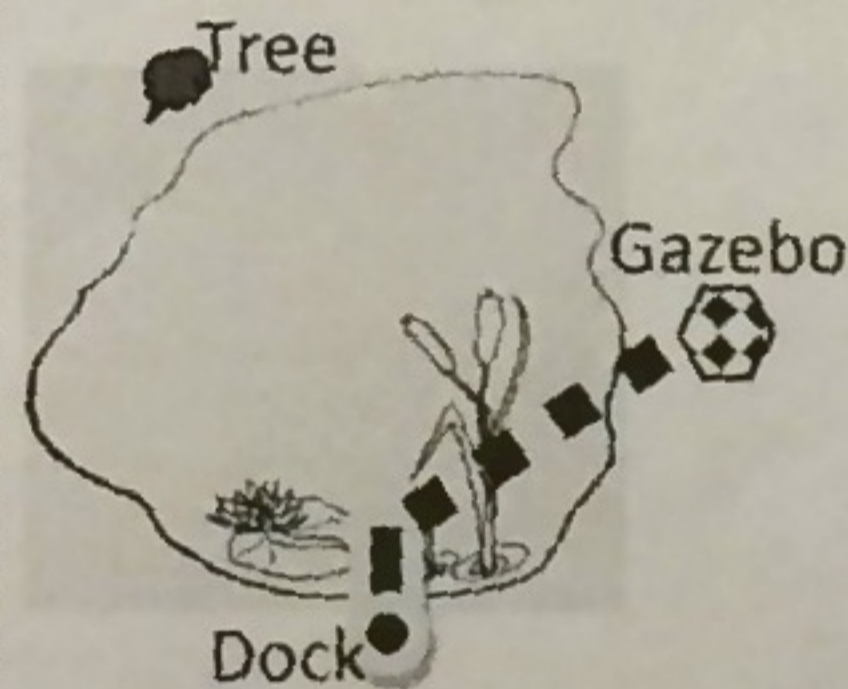
North 429.3 miles
 West 2434.4 miles

Solve each. Draw a figure, write the appropriate equation, show calculator ready, and solve.

12. A plane is observe approaching your home and you assume the speed is 550 mph. The angle of elevation of the plane is 16° at one time and 57° one minute later. Approximate the altitude of the air plane.

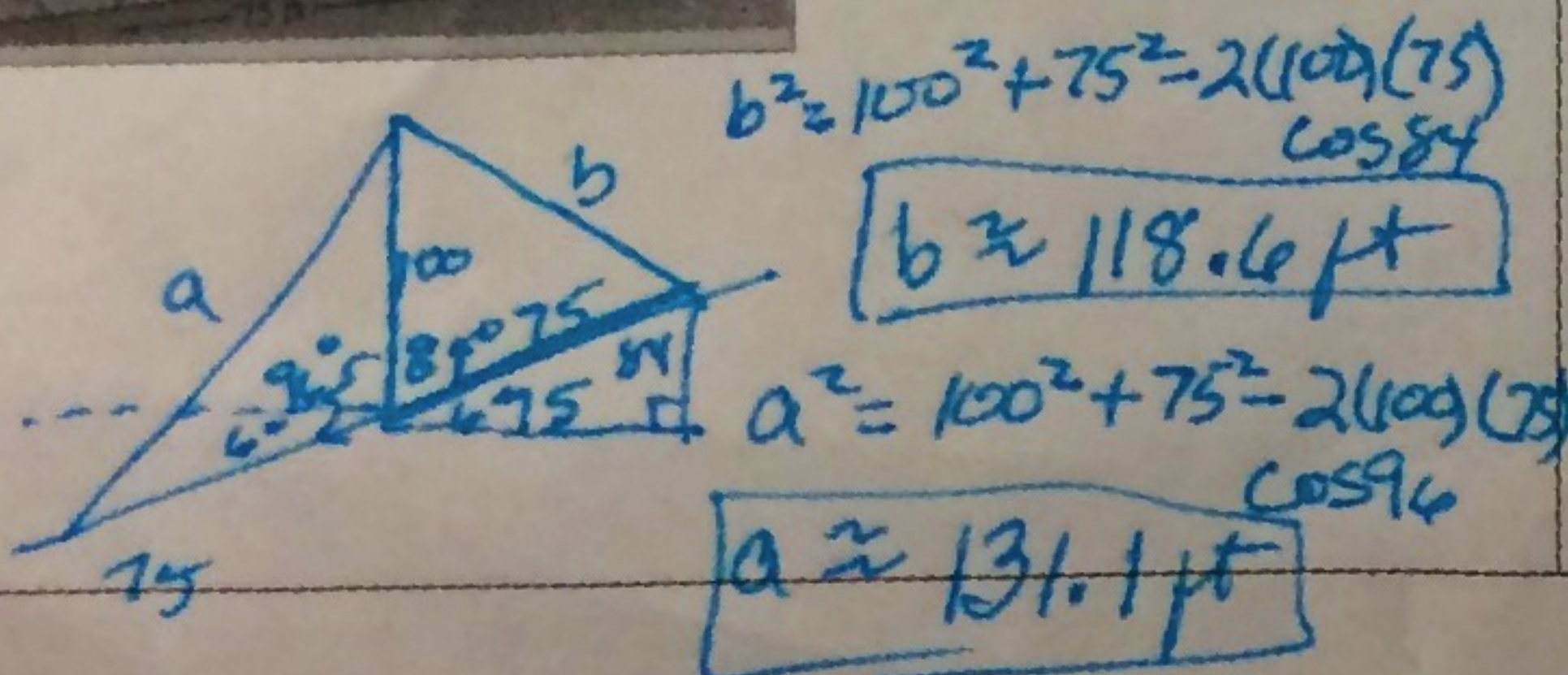


13. A bridge is to be built across a small pond from a gazebo to a dock. The bearing from the gazebo to the dock is S 41° W. From a tree 100 meters from the gazebo, the bearings to the gazebo and the dock are S 75° E and S 28° E, respectively. Find the distance from the gazebo to the dock.



78.3 m

14. A 100 foot vertical tower is to be erected on the side of a hill that makes a 6° angle with the horizontal. Find the length of each of the guy wires that will be anchored 75 feet uphill and downhill from the base of the tower.



15. A baseball player in center field is playing approximately 330 feet from the television camera that is behind home plate. A batter hits a fly ball that goes to the wall 420 feet from the camera. The camera turns 8° to follow the play. Approximately how far does the center fielder have to run to make the catch?



104 ft.