Today's Plan:

Learning Target (standard): I will use the Law of Sines to solve triangles.

Students will: Complete practice problems over previous concepts at the boards, put up homework problems on the board and make necessary corrections to their own work, take notes over new material and complete practice problems over new concepts.

Teacher will: Provide practice problems over previous concepts, check homework problems for accuracy and provide students feedback, describe and provide examples of new concepts and assign students assessment problems over new concepts.

Assessment: Board work, homework check and homework assignment

Differentiation: Students will work at the board, go over and correct homework at their seats, actively engage in lecture over new concepts, practice new concepts with the aid of other students and the teacher and complete homework assignment.

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30) $76.6\,ft$

31) $1490.5\,ft$

32) $629.9\,ft$

34) $1053.2\,ft$

36) $0.31\min \approx 19\sec$

38) $6.8 inches$

40a) $3.21 miles$

b) $3.78 miles$

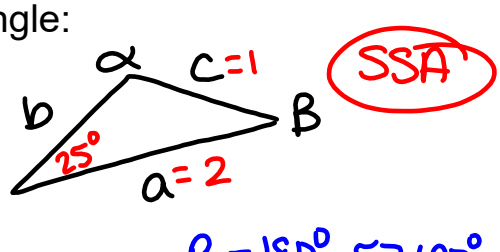
c) $3.10 miles$

Solve the triangle:

$a = 2$

$c = 1$

$\gamma = 25°$



$\frac{\sin\alpha}{a} = \frac{\sin\gamma}{c}$

$\frac{\sin\alpha}{2} = \frac{\sin 25°}{1}$

$\sin\alpha = 2\sin 25°$

$\sin\alpha = .8452$

$\sin^{-1}(.8452) = \alpha$

$\alpha = 57.697°$

$\beta_1 = 180° - 57.697° - 25°$

$\beta_1 = 97.303°$

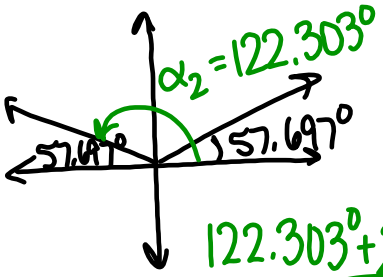
$\frac{\sin\beta_1}{b_1} = \frac{\sin\gamma}{c}$

$\frac{\sin 97.303°}{b_1} = \frac{\sin 25°}{1}$

$b_1 \sin 25° = \sin 97.303°$

$b_1 = \frac{\sin 97.303°}{\sin 25°}$

$b_1 = 2.347$



$122.303° + 25° < 180°$

2 triangles

$\alpha_1 = 57.697°$

$\beta_1 = 97.303°$

$b_1 = 2.347$

$\alpha_2 = 122.303°$

$\beta_2 = 32.697°$

$b_2 = 1.278$

$\frac{\sin\beta_2}{b_2} = \frac{\sin\gamma}{c}$

$\frac{\sin 32.697°}{b_2} = \frac{\sin 25°}{1}$

$b_2 \sin 25° = \sin 32.697°$

$b_2 = \frac{\sin 32.697°}{\sin 25°}$

$b_2 = 1.278$

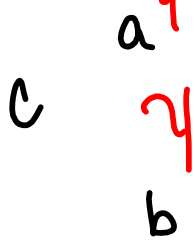
Coast Guard Station Able is located 150 miles due south of Station Baker. A ship at sea sends an SOS call that is received by each station. The call to Station Able indicates that the ship is located N55°E; the call to Station Baker indicates that the ship is located S60°E.

a) How far is each station from the ship?

b) If a helicopter capable of flying 200 miles per hour is dispatched from the nearest station to the ship, how long will it take to reach the ship?

$\gamma = 180° - 60° - 55°$

$\gamma = 65°$



a) Baker:

$$\frac{\sin 55°}{a} = \frac{\sin 65°}{150}$$

$$a \sin 65° = 150 \sin 55°$$

$$a = \frac{150 \sin 55°}{\sin 65°}$$

$a = 135.575$ mi

to Baker Station

Able:

$$\frac{\sin 60°}{b} = \frac{\sin 65°}{150}$$

$$b \sin 65° = 150 \sin 60°$$

$$b = \frac{150 \sin 60°}{\sin 65°}$$

$b = 143.333$ mi

to Able Station

b) nearest is Baker

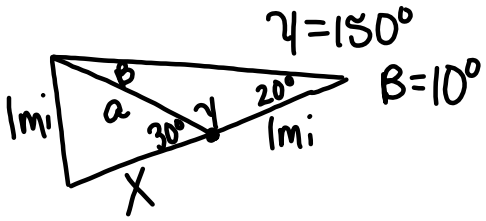
$r \cdot t = d$

$200t = 135.575$

$t = 0.678$ hr

$0.678(60) = 40.673$ min

The navigator of a ship at sea has the harbor in sight at which the ship is to dock. She spots a lighthouse that she knows is 1 mile up the coast from the mouth of the harbor, and she measures the angle between the line-of-sight observations of the harbor and lighthouse to be 20°. With the ship heading directly toward the harbor, she repeats this measurement after 5 minutes of traveling at 12 miles per hour. If the new angle is 30°, how far is the ship from the harbor?

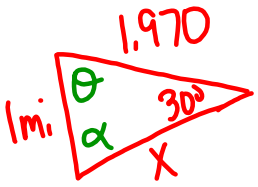


$$\frac{\sin 20^\circ}{a} = \frac{\sin 10^\circ}{1}$$

$$a\sin 10^\circ = \sin 20^\circ$$

$$a = \frac{\sin 20^\circ}{\sin 10^\circ}$$

$$a = 1.970 \text{ mi}$$

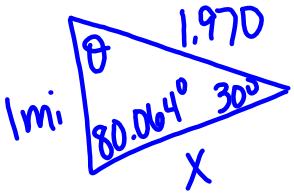


$$\frac{\sin\alpha}{1.970} = \frac{\sin 30^\circ}{1}$$

$$\sin\alpha = 1.970\sin 30^\circ$$

$$\sin\alpha = .985$$

$$\alpha = 80.064^\circ$$



$$\theta = 180^\circ - 80.064^\circ - 30^\circ$$

$$\theta = 69.936^\circ$$

$$\frac{\sin 69.936^\circ}{X} = \frac{\sin 30^\circ}{1}$$

$$X\sin 30^\circ = \sin 69.936^\circ$$

$$X = \frac{\sin 69.936^\circ}{\sin 30^\circ}$$

$$X = 1.879 \text{ mi}$$

Assignment:

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* Draw ALL appropriate diagrams! *