

## 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.

## p.538 #4-28 (by4)

4) $\alpha = 25^\circ$

$a \approx 8.45$

$c \approx 16.38$

8) $\gamma = 50^\circ$

$a \approx 11.82$

$c \approx 9.19$

12) $\gamma = 50^\circ$

$a \approx 4.91$

$b \approx 4.52$

16) $\alpha = 90^\circ$

$b \approx 0.34$

$c \approx 0.94$

20)1 $\Delta$

$\gamma = 25.7^\circ$

$\beta = 34.3^\circ$

$b \approx 1.30$

24)0 $\Delta$

$\sin \beta = 2.1926 > 1$

28)2 $\Delta$

$\gamma_1 = 53.5^\circ$

$\alpha_1 = 86.5^\circ$

$a_1 \approx 6.21$

$\gamma_2 = 126.5^\circ$

$\alpha_2 = 13.5^\circ$

$a_2 \approx 1.45$

Determine whether the given information results in one, two, or no triangles. Solve any triangle(s) that result.

$b = 4$   
 $c = 6$   
 $\beta = 20^\circ$

**SSA**

$$\frac{\sin \beta}{b} = \frac{\sin \gamma}{c}$$

$$\frac{\sin 20^\circ}{4} = \frac{\sin \gamma}{6}$$

$$4 \sin \gamma = 6 \sin 20^\circ$$

$$\sin \gamma = \frac{6 \sin 20^\circ}{4}$$

$$\sin \gamma = 0.5130$$

$$\gamma = \sin^{-1}(0.5130)$$

$$\gamma = 30.866^\circ$$

$$\alpha_1 = 180^\circ - 20^\circ - 30.866^\circ$$

$$\alpha_1 = 129.134^\circ$$

$$\alpha_2 = \beta + \gamma_2 = 20^\circ + 149.134^\circ < 180^\circ$$

$$\alpha_2 = 10.866^\circ$$

**2 triangles**

$$\frac{\sin \alpha_1}{a_1} = \frac{\sin \beta}{b}$$

$$\frac{\sin 129.134^\circ}{a_1} = \frac{\sin 20^\circ}{4}$$

$$4 \sin 20^\circ = a_1 \sin 129.134^\circ$$

$$a_1 = \frac{4 \sin 129.134^\circ}{\sin 20^\circ}$$

$$a_1 = 9.072$$

$$\frac{\sin \alpha_2}{a_2} = \frac{\sin \beta}{b}$$

$$\frac{\sin 10.866^\circ}{a_2} = \frac{\sin 20^\circ}{4}$$

$$4 \sin 20^\circ = a_2 \sin 10.866^\circ$$

$$a_2 = \frac{4 \sin 10.866^\circ}{\sin 20^\circ}$$

$$a_2 = 2.205$$

$\gamma_1 = 30.866^\circ$      $\gamma_2 = 149.134^\circ$   
 $\alpha_1 = 129.134^\circ$      $\alpha_2 = 10.866^\circ$   
 $a_1 = 9.072$          $a_2 = 2.205$

Solve the triangle:

$\alpha = 110^\circ$   
 $\gamma = 30^\circ$   
 $c = 3$

**AAS**

$$\beta = 180^\circ - 110^\circ - 30^\circ$$

$$\beta = 40^\circ$$

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

$$\frac{\sin 110^\circ}{a} = \frac{\sin 30^\circ}{3}$$

$$a \sin 30^\circ = 3 \sin 110^\circ$$

$$a = \frac{3 \sin 110^\circ}{\sin 30^\circ}$$

$$a = 5.638$$

$$\frac{\sin \beta}{b} = \frac{\sin \gamma}{c}$$

$$\frac{\sin 40^\circ}{b} = \frac{\sin 30^\circ}{3}$$

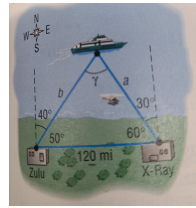
$$b \sin 30^\circ = 3 \sin 40^\circ$$

$$b = \frac{3 \sin 40^\circ}{\sin 30^\circ}$$

$$b = 3.857$$

Coast Guard Station Zulu is located 120 miles due west of Station X-Ray. A ship at sea sends an SOS call that is received by each station. The call to Station Zulu indicates that the bearing of the ship from Zulu is  $N40^\circ E$  ( $40^\circ$  east of north). The call to X-Ray indicates that the bearing of the ship from X-Ray is  $N30^\circ W$ .

- 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?



a) Zulu:

$$\frac{\sin 60^\circ}{b} = \frac{\sin 70^\circ}{120}$$

$$b \sin 70^\circ = 120 \sin 60^\circ$$

$$b = \frac{120 \sin 60^\circ}{\sin 70^\circ}$$

$$b = 110.593 \text{ mi.}$$

to Zulu

b) nearest is X-Ray

$$r \cdot t = d$$

$$200t = 97.825$$

$$t = .489 \text{ hr}$$

X-Ray:

$$\frac{\sin 50^\circ}{a} = \frac{\sin 70^\circ}{120}$$

$$a \sin 70^\circ = 120 \sin 50^\circ$$

$$a = \frac{120 \sin 50^\circ}{\sin 70^\circ}$$

$$a = 97.825 \text{ mi.}$$

to X-Ray

$$.489(60) = 29.348 \text{ minutes}$$

## Assignment:

p.539 #30,31,32-40 even

\* Draw ALL appropriate diagrams! \*