

Today's Plan:

Learning Target (standard): I will use the Law of Sines and Cosines to solve triangles. I will find the area of oblique 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

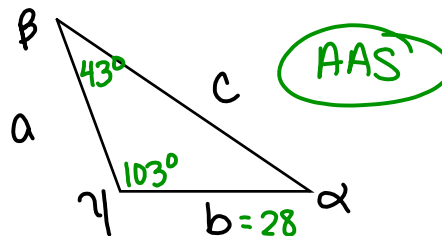
Differentiation: Students will work at the board, go over and correct homework at their seats, actively engage in lecture over new concepts, practice new concepts with the aid of other students and the teacher and complete homework assignment.

Solve the triangle:

$$b = 28 \text{ mi}$$

$$\beta = 43^\circ$$

$$\gamma = 103^\circ$$



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

$$\frac{\sin 43^\circ}{28} = \frac{\sin 103^\circ}{c}$$

$$c \sin 43^\circ = 28 \sin 103^\circ$$

$$c = \frac{28 \sin 103^\circ}{\sin 43^\circ}$$

$$c = 40.004 \text{ mi}$$

$$\alpha = 180^\circ - 43^\circ - 103^\circ$$

$$\alpha = 34^\circ$$

$$\frac{\sin \alpha}{a} = \frac{\sin \beta}{b}$$

$$\frac{\sin 34^\circ}{a} = \frac{\sin 43^\circ}{28}$$

$$a \sin 43^\circ = 28 \sin 34^\circ$$

$$a = \frac{28 \sin 34^\circ}{\sin 43^\circ}$$

$$a = 22.958 \text{ mi}$$

Solve the triangle:

$a = 23\text{cm}$
 $c = 21\text{cm}$
 $\alpha = 107^\circ$

SSA

$\frac{\sin \alpha}{a} = \frac{\sin \gamma}{c}$
 $\frac{\sin 107^\circ}{23} = \frac{\sin \gamma}{21}$
 $23 \sin \gamma = 21 \sin 107^\circ$
 $\sin \gamma = \frac{21 \sin 107^\circ}{23}$
 $\sin \gamma = .8731$
 $\gamma = 60.827^\circ$

$B = 180^\circ - 107^\circ - 60.827^\circ$
 $B = 12.173^\circ$

$\frac{\sin \alpha}{a} = \frac{\sin \beta}{b}$
 $\frac{\sin 107^\circ}{23} = \frac{\sin 12.173^\circ}{b}$
 $b \sin 107^\circ = 23 \sin 12.173^\circ$
 $b = \frac{23 \sin 12.173^\circ}{\sin 107^\circ}$
 $b = 5.071\text{cm}$

$180^\circ - 119.173^\circ - 107^\circ < 0$

1 triangle

Find the **area** the triangle:

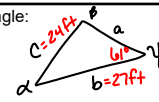
$a = 7.7\text{m}$
 $b = 9.2\text{m}$
 $c = 4\text{m}$

SSS

$S = \frac{1}{2}(a+b+c)$
 $S = \frac{1}{2}(7.7+9.2+4)$
 $S = \frac{1}{2}(20.9)$
 $S = 10.45$

$A = \sqrt{S(S-a)(S-b)(S-c)}$
 $= \sqrt{10.45(10.45-7.7)(10.45-9.2)(10.45-4)}$
 $= \sqrt{10.45(2.75)(1.25)(6.45)}$
 $= \sqrt{231.6910}$
 $A = 15.222\text{m}^2$

Solve the triangle:



$b = 27 \text{ ft}$
 $c = 24 \text{ ft}$
 $\gamma = 61^\circ$

$\frac{\sin \beta}{b} = \frac{\sin \gamma}{c}$
 $\frac{\sin \beta}{27} = \frac{\sin 61^\circ}{24}$
 $24 \sin \beta = 27 \sin 61^\circ$
 $\sin \beta = \frac{27 \sin 61^\circ}{24}$
 $\sin \beta = \frac{27(.8746)}{24}$
 $\sin \beta = 0.9839$
 $\beta = \sin^{-1}(0.9839)$
 $\beta = 79.720^\circ$

$\alpha_1 = 180^\circ - 61^\circ - 79.720^\circ$
 $\alpha_1 = 39.28^\circ$

$\frac{\sin \alpha}{a} = \frac{\sin \gamma}{c}$
 $\frac{\sin 39.28^\circ}{a_1} = \frac{\sin 61^\circ}{24}$
 $a_1 \sin 61^\circ = 24 \sin 39.28^\circ$
 $a_1 = \frac{24 \sin 39.28^\circ}{\sin 61^\circ}$
 $a_1 = \frac{24(.6331)}{.8746}$
 $a_1 = 17.373$

$\beta_2 = 180^\circ - 79.720^\circ$
 $\beta_2 = 100.280^\circ$

$61^\circ + 100.280^\circ < 180^\circ$ (ZSS)

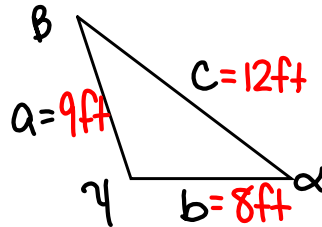
$\alpha_2 = 180^\circ - 61^\circ - 100.280^\circ$
 $\alpha_2 = 18.72^\circ$

$\frac{\sin \alpha}{a} = \frac{\sin \gamma}{c}$
 $\frac{\sin 18.72^\circ}{a_2} = \frac{\sin 61^\circ}{24}$
 $a_2 \sin 61^\circ = 24 \sin 18.72^\circ$
 $a_2 = \frac{24 \sin 18.72^\circ}{\sin 61^\circ}$
 $a_2 = \frac{24(.3209)}{.8746}$
 $a_2 = 8.807$

$\beta_1 = 79.720^\circ$
 $\alpha_1 = 39.28^\circ$
 $a_1 = 17.373$

Find the **area** the triangle:

$a = 9 \text{ ft}$
 $b = 8 \text{ ft}$
 $c = 12 \text{ ft}$



$S = \frac{1}{2}(a+b+c)$
 $= \frac{1}{2}(9+8+12)$

$S = \frac{1}{2}(29)$
 $S = \frac{29}{2}$

$A = \sqrt{S(s-a)(s-b)(s-c)}$
 $= \sqrt{\frac{29}{2}(\frac{29}{2}-9)(\frac{29}{2}-8)(\frac{29}{2}-12)}$

$= \sqrt{\frac{29}{2} \cdot \frac{11}{2} \cdot \frac{13}{2} \cdot \frac{5}{2}}$

$= \sqrt{\frac{20735}{16}}$

$A = \frac{\sqrt{20735}}{4} \text{ ft}^2$

* TEST on Solving Oblique Triangles and finding the area of oblique triangles - non-applied section Friday *

*TEST - Applied section of oblique triangles will be Monday *