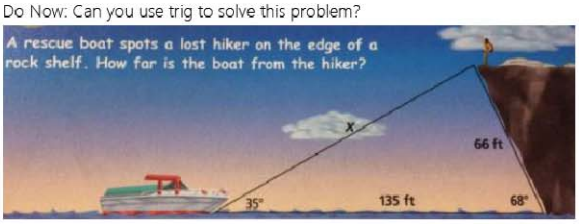
Name:_____ Date:_____
Period:____ Mr. Valentino

Aim: What is the Law of Sines?

Do Now: Can you use trig to solve this problem?



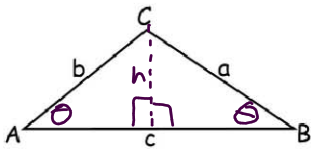
Why or why not?

No, this is not a right triangle.

LAW OF SINES

$$\frac{\sin A}{a} = \frac{\sin B}{b} = \frac{\sin C}{c} \quad \text{OR} \quad \frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

Proving the Law of Sines



$\frac{\sin A}{1} = \frac{h}{b}$ $\frac{\sin B}{1} = \frac{h}{a}$

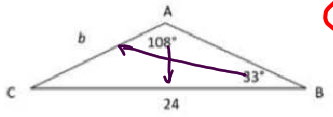
$h = b\sin A$ $h = a\sin B$

$b\sin A = a\sin B$

$\frac{b\sin A}{ab} = \frac{a\sin B}{ab}$

$\frac{\sin A}{a} = \frac{\sin B}{b}$

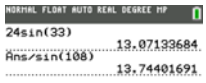
Find the length of b. Round to the nearest tenth.



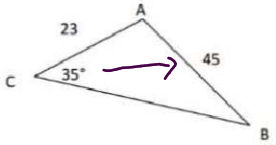
$\frac{\sin 33}{b} = \frac{\sin 108}{24}$

$\frac{b\sin 108}{\sin 108} = \frac{24\sin 33}{\sin 108}$

$b = 13.7$



Find the measure of angle B to the nearest degree.

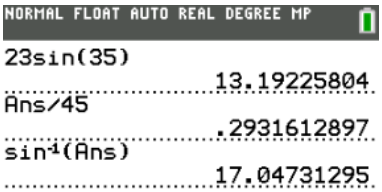


$\frac{\sin 35}{45} = \frac{\sin B}{23}$

$\frac{23\sin 35}{45} = \frac{45\sin B}{45}$

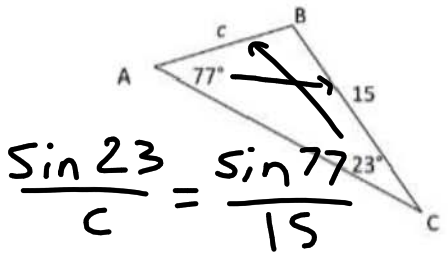
$\frac{23\sin 35}{45} = \sin B$

$B = 17°$



Practice Problems

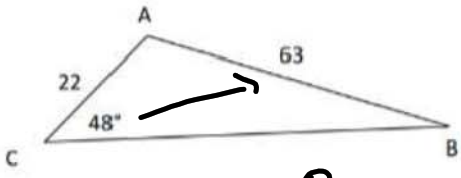
1. For ΔABC find c to the nearest hundredth.



$\frac{\sin 23}{c} = \frac{\sin 77}{15}$

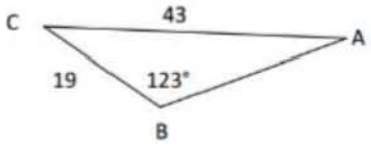
$\frac{c \sin 77}{\sin 77} = \frac{15 \sin 23}{\sin 77}$

2. For ΔABC find $m\angle B$ to the nearest whole degree.

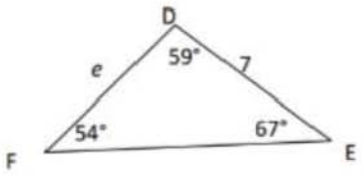


$\frac{\sin B}{22} = \frac{\sin 48}{63}$

3. For ΔABC find $m\angle A$ to the nearest whole degree.



4. For ΔDEF find e to the nearest hundredth.



5. For $\Delta ABC, a = 18, b = 6$, and $m\angle A = 28°$. Find $m\angle B$ to the nearest whole degree.

6. For $\Delta DEF, d = 54, f = 27$, $m\angle D = 20°$. Find $m\angle F$ to the nearest whole degree.