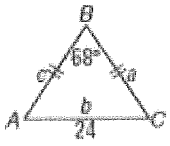
Name: _____ Hour: _____

Law of Sines Solving for a Triangle

Notes:

Directions: Round to the nearest tenth if needed.

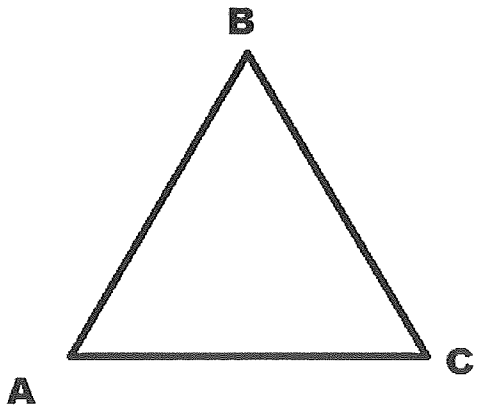
1. **Example** **Isosceles ΔABC has a base of 24 centimeters and a vertex angle of 68°. Find the perimeter of the triangle.**



The vertex angle is 68°, so the sum of the measures of the base angles is 112 and $m\angle A = m\angle C = 56$.

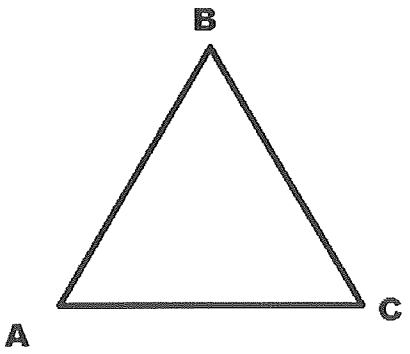
Practice: solve the triangle.

2. If $a = 25$, $m\angle A = 72$, and $m\angle B = 17$

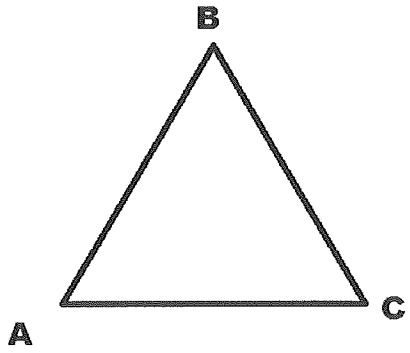


Name: _____ Hour: _____

3. If $b = 12$, $m\angle A = 89$, and $m\angle B = 80$



4. If $a = 30$, $c = 20$, and $m\angle A = 60$,



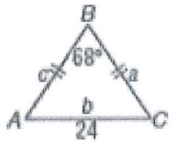
Name: Key Hour: _____

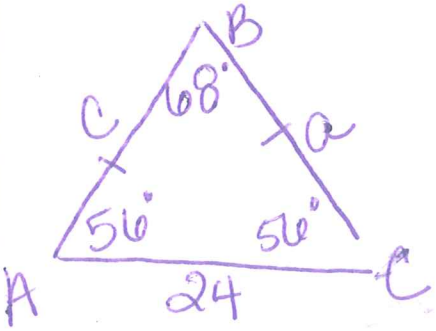
Law of Sines Solving for a Triangle

Notes:

Directions: Round to the nearest tenth if needed.

1. **Example** **Isosceles $\triangle ABC$ has a base of 24 centimeters and a vertex angle of 68°. Find the perimeter of the triangle.**
The vertex angle is 68°, so the sum of the measures of the base angles is 112 and $m\angle A = m\angle C = 56$.





Find a

$\frac{\sin(68)}{24} = \frac{\sin(56)}{a}$

$\frac{a \cdot \sin(68)}{\sin(68)} = \frac{24\sin(56)}{\sin(68)}$

$a \approx 21.5\text{cm}$

Want to find the perimeter!

$a = 21.5\text{cm}$

$c = 21.5\text{cm}$

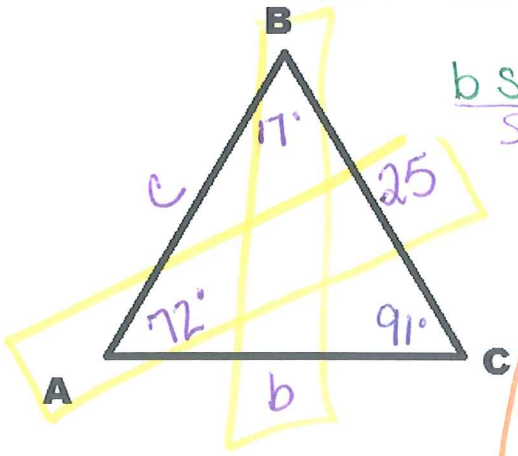
$b = 24\text{cm}$

$P = 21.5 + 21.5 + 24$

$P = 67\text{cm}$

Practice: solve the triangle.

2. **If $a = 25$, $m\angle A = 72$, and $m\angle B = 17$**



Find b

$\frac{\sin(72)}{25} = \frac{\sin(17)}{b}$

$\frac{b\sin(72)}{\sin(72)} = \frac{25 \cdot \sin(17)}{\sin(72)}$

$b = 7.7$

$b = 7.7$

$\angle C = 91°$

To find $m\angle C$ Just use $\triangle$ sum!

$\angle C + 17 + 72 = 180$

$\angle C = 91°$

$C = 26.3$

Find c

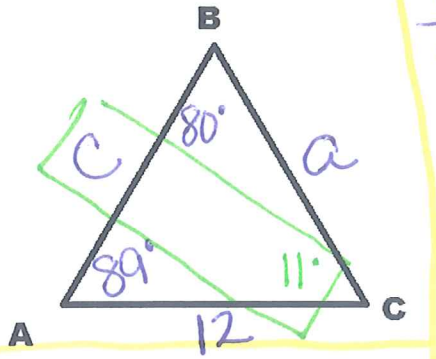
$\frac{\sin(72)}{25} = \frac{\sin(91)}{c}$

$c\sin(72) = 25\sin(91)$

$C \approx 26.3$

3. **If $b = 12$, $m\angle A = 89$, and $m\angle B = 80$**

Name: _____ Hour: _____



To find $\angle C$ use Δ sum

$\angle C = 11°$

Find a

$$\frac{\sin(80)}{12} = \frac{\sin(89)}{a}$$

$$\frac{a\sin(80)}{\sin(80)} = \frac{12\sin(89)}{\sin(80)}$$

$a = 12.2$

$\angle C = 11°$

$c = 2.3$

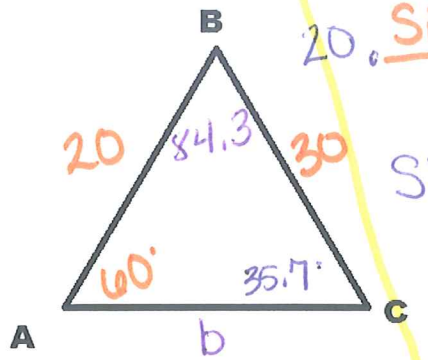
Find c

$$\frac{\sin(11)}{c} = \frac{\sin(80)}{12}$$

$$\frac{12\sin(11)}{\sin(80)} = \frac{c\sin(80)}{\sin(80)}$$

$2.3 = c$

4. **If $a = 30$, $c = 20$, and $m\angle A = 60$,**



Find $\angle C$

$$20 \cdot \frac{\sin C}{20} = \frac{\sin(60)}{30} \cdot 20$$

$$\sin C = \frac{20 \cdot \sin(60)}{30}$$

$$\angle C = \sin^{-1}\left(\frac{20\sin(60)}{30}\right)$$

$\angle C = 35.7°$

$\angle C = 35.7°$

$\angle B = 84.3°$ (Δ sum)

$b = 34.5$

$$\frac{\sin(60)}{30} = \frac{\sin(84.3)}{b}$$

$$b\sin(60) = 30\sin(84.3)$$

$b = 34.5$

Law of Sines Solving for a Triangle