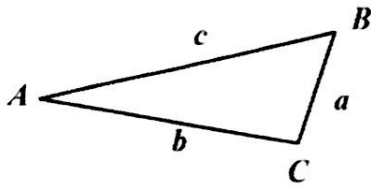


7.6 – Review Law of Sines and Cosines

Law of Sines:

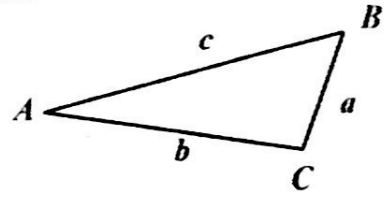


$$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

or

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

Law of Cosines:



$$c^2 = a^2 + b^2 - 2ab \cos C$$

or

$$b^2 = a^2 + c^2 - 2ac \cos B$$

or

$$a^2 = b^2 + c^2 - 2bc \cos A$$

When do you use Law of Sines?

- AAS
- ASA
- ★ **ASS** → **DONKEY THM.**
Possible 2 Triangle

When do you use Law of Cosines?

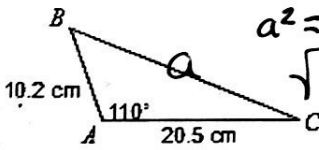
- SSS
- SAS

****Remember to solve largest side or angle to smallest.**

Examples: 1) Determine if you would use the Law of Sines or the Law of Cosines to find the missing value or solve the triangle. 2) Solve the even problems.

1. Find BC a

Law of Cosines



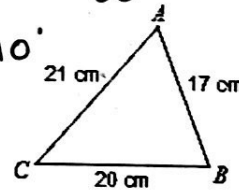
$$a^2 = 10.2^2 + 20.5^2 - 2(10.2)(20.5) \cos 110^\circ$$

$$\sqrt{a^2} = \sqrt{667.32}$$

a = 25.8 cm

2. **SSS**

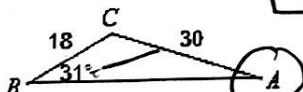
Cosines



3. Find m∠A

Sines

Possible 2 Δ's



m∠A = 18°

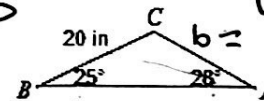
$$\frac{\sin A}{18} = \frac{\sin 31}{30}$$

$$30 \sin A = 18 \sin 31$$

$$A = \sin^{-1} \left(\frac{18 \sin 31}{30} \right)$$

4. Find AE b

Sines



b = 18 in

$$\frac{b}{\sin 25} = \frac{20}{\sin 28}$$

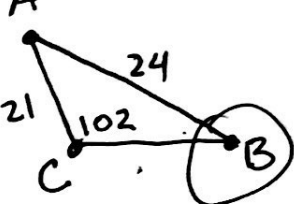
$$b \sin 28 = 20 \sin 25$$

$$b = \frac{20 \sin 25}{\sin 28}$$

5. $m\angle C = 102^\circ$, $b = 21$ mi, $c = 24$ mi

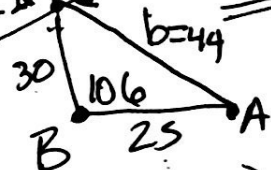
Draw Picture

SSA



Start w/ B

Possible 2 Δ's



$$C = \sin^{-1} \left(\frac{25 \sin 106}{44} \right)$$

6. $m\angle B = 106^\circ$, $c = 25$ m, $a = 30$ m

SAS

Cosines

$$b^2 = 30^2 + 25^2 - 2(30)(25) \cos 106$$

$$\sqrt{b^2} = \sqrt{1938.46}$$

b = 44 cm

m∠C = 33.1°

$$\frac{\sin C}{25} = \frac{\sin 106}{44}$$

$$44 \sin C = 25 \sin 106$$

$$C = \sin^{-1} \left(\frac{25 \sin 106}{44} \right)$$