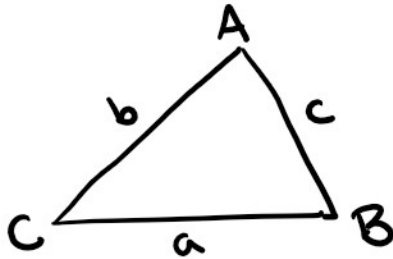


### Right Δ's

- Pythagorean Theorem
- SOHCAHTOA
- Inverse Trig. functions



### Other Methods

- Law of Sines (AAS, ASA, ASS)
- Law of Cosines (SSS, SAS)
- All Δ's have 180°

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

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

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

Steps:

① Setup Law of Sines

- Solve if any fraction is complete
- Move on to step 2 if no fraction is complete

② Setup Law of Cosines

- **SSS** use Law of Cosines formula that includes the **GREATEST ANGLE**
- **SAS** use Law of Cosines formula that includes the **GIVEN ANGLE**

③ Switch to Law of Sines

and solve for the **SMALLEST ANGLE**

④ Use the fact

that all Δ's have a total of 180° to calculate the

Case 1: SSS

a=8 b=19 c=14

$$\frac{\sin A}{8} = \frac{\sin B}{19} = \frac{\sin C}{14}$$

② since b is the greatest side length, B will be the greatest angle

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

$$19^2 = 8^2 + 14^2 - (2 \cdot 8 \cdot 14 \cdot \cos B)$$

$$361 = 64 + 196 - (224 \cos B)$$

$$361 = 260 - (224 \cos B)$$

$$\frac{101}{-224} = \frac{-224 \cdot \cos B}{-224}$$

$$\cos^{-1} - 0.45 = \cos B$$

$$116.80^\circ = B \quad \checkmark$$

$$\frac{\sin A}{8} = \frac{\sin 116.80^\circ}{19} = \frac{\sin C}{14}$$

Case 2: SAS

b=15 A=115° c=10

$$\frac{\sin 115^\circ}{a} = \frac{\sin B}{15} = \frac{\sin C}{10}$$

② since A is the given angle, we must use the A formula

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

$$a^2 = 15^2 + 10^2 - (2 \cdot 15 \cdot 10 \cdot \cos 115^\circ)$$

$$\sqrt{a^2} = \sqrt{451.79}$$

$$a = 21.26 \quad \checkmark$$

$$\frac{\sin 115^\circ}{21.26} = \frac{\sin B}{15} = \frac{\sin C}{10}$$

side length c is the smallest side, so angle C is the smallest angle

$$\frac{\sin 115^\circ}{21.26} = \frac{\sin C}{10}$$

to calculate the final missing angle

$$\frac{\sin A}{8} = \frac{\sin 116.80}{19}$$

a=8 is the smallest side length, therefore angle A is the smallest angle

$$\frac{\sin A}{8} = \frac{\sin 116.80}{19}$$

$$8 \cdot \frac{\sin A}{8} = 0.05 \cdot 8$$

$$\sin A = \sin^{-1} 0.38$$

$$\boxed{A = 22.08^\circ} \checkmark$$

$$\textcircled{4} A + B + C = 180^\circ$$

$$22.08^\circ + 116.80^\circ + C = 180^\circ$$

$$\boxed{C = 41.12^\circ}$$

$$21.26 \quad 10$$

$$10 \cdot 0.04 = \frac{\sin C}{10}$$

$$\sin^{-1} 0.43 = \sin C$$

$$\boxed{25.23^\circ = C} \checkmark$$

$$\textcircled{4} A + B + C = 180^\circ$$

$$115^\circ + B + 25.23^\circ = 180^\circ$$

$$\boxed{B = 39.77^\circ}$$