

2.5 Solving Triangles

Summary of triangles & given information:

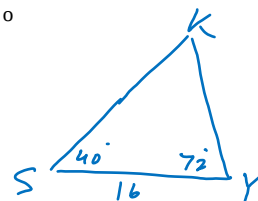
Triangle Type	Approach
AAA	Not Possible
ASA ⁴	Sine Law
AAS	Sine Law
SSS	Cosine Law
SAS	Cosine Law
SSA	Sine Law (Ambig)
Right	Trig Ratios



Remember, to solve a triangle, we are finding all angles and all sides, then checking to ensure appropriate sides and angles match up.

Example 1: Solve the triangle: $S = 40^\circ$, $k = 16\text{m}$, $Y = 72^\circ$

ASA



$$\angle K = 180^\circ - 40^\circ - 72^\circ$$

Now use Sine Law :

$$\frac{\sin K}{k} = \frac{\sin S}{s}$$

$$\frac{\sin 68^\circ}{16} = \frac{\sin 40^\circ}{s}$$

$$\therefore s = 11.1$$

$$\angle S = 40^\circ \quad s = 11.1$$

$$\angle K = 68^\circ \quad k = 16$$

$$\angle Y = 72^\circ \quad y = 16.4$$

$$\frac{\sin K}{k} = \frac{\sin Y}{y}$$

$$\frac{\sin 68^\circ}{16} = \frac{\sin 72^\circ}{y}$$

$$\therefore y = 16.4$$



Example 2: A triangle has sides 15.4 cm, 52.8 cm and 55 cm. Find all three angles to the nearest degree.

hmmmm must use
Cosine Law, unless

$$\angle A = 15.4 \quad a = 16^\circ$$

$$\angle B = 52.8 \quad b = 74^\circ$$

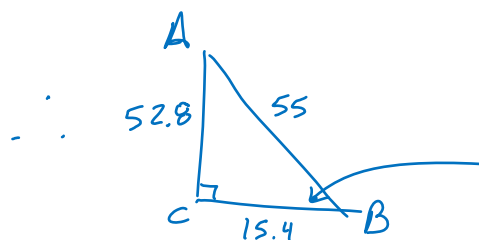
$$\angle C = 55 \quad c = 90^\circ$$

→ is it a right Δ ?

$$15.4^2 + 52.8^2 = 55^2$$

$$237.16 + 2787.84 = 3025$$

$$3025 = 3025 \quad \therefore \text{Right } \Delta !$$



$$\sin B = \frac{\text{opp}}{\text{hyp}}$$

$$= \frac{52.8}{55}$$

$$= 0.96$$

$$\therefore B = 74^\circ$$

Assignment: Worksheet: Solving Triangles