A Intro:

--- fill in w/ A, S (8 possibilities)

\[ \frac{A}{A} \frac{A}{A} \frac{A}{A} \]

Insuff. info No Specific triangle.

Solve by

\[ \frac{A}{A} \frac{S}{A} \frac{A}{A} \]

Law of Cainses

\[ \frac{S}{A} \frac{S}{A} \frac{S}{S} \]

Bad boy - Los 3 possible outcomes: May be

0 triangles 1 triangle 2 triangles

B What IS the Law of Sines (LOS)?

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

Short-hand: for 3 equations

[1] \[ \frac{\sin A}{a} = \frac{\sin B}{b} \] and/or

[II] \[ \frac{\sin A}{a} = \frac{\sin C}{c} \] and/or

[III] \[ \frac{\sin B}{b} = \frac{\sin C}{c} \]
Also \[ \frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C} \]

Examples: ASA

\[ \angle A = 23^\circ, \angle B = 110^\circ, c = 50 \]

\[ \angle C = 47^\circ \]

\[ \frac{b}{\sin 110^\circ} = \frac{50}{\sin 47^\circ} \]

\[ b = \frac{50 \sin 110^\circ}{\sin 47^\circ} \]

On calc.

\[ b \approx 64.2433 \approx 64 \]

\[ \frac{a}{\sin 23^\circ} = \frac{50}{\sin 47^\circ} \]

\[ a = \frac{50 \sin 23^\circ}{\sin 47^\circ} \]

\[ a \approx 26.71 \approx 27 \]

Example - Ambiguous Case, ASS.

1. Too short - No triangle
2. Just right - 1 triangle, rt. triangle
2 Possible triangles 
\[ \triangle ABC \text{ and } \triangle ABC' \]

Here \( s_2 \) was longer than \( h \), the distance from \( B \) to the "base" \( \overline{AC} \), and shorter than \( s_1 \).

\[ \text{The final case is when } s_2 \text{ is longer than } s_1 \]

Here \( s_2 \) is way longer than \( s_1 \), so there is only one possible triangle.

\[ \text{We shall study more of these tomorrow.} \]