Other Similarity Shortcuts

"Seek simplicity, and distrust it."

- Alfred North Whitehead

1. a. Measure $BC$, $EF$, $\angle E$, $\angle C$, $\angle B$, and $\angle F$.

   b. What can we now say about the triangles? Why? $\sim \triangle ABF$

   c. How would you describe the necessary requirements for this shortcut?

   - Included $\angle$,
   - 2 pairs of proportional sides

   $\triangle ABC \sim \triangle DEF$
Side-Angle-Side Similarity (Theorem 7-1)

If an angle of one triangle is congruent to an angle of another triangle, and the sides including those angles are in proportion, then the triangles are similar.
Side-Side-Side Similarity (Theorem 7-2)

If the sides of two triangles are in proportion, then the triangles are similar.

Example 1: Can any triangles be shown similar? If so, state the similarity and reason.

a) \( \triangle A \sim \triangle B \)

b) 
\[
\begin{align*}
\frac{8}{6} &= \frac{4}{3} \\
\frac{12}{9} &= \frac{4}{3}
\end{align*}
\]

SSA doesn’t work.
Example 2: Given the side lengths shown, prove that $\overline{AE} \parallel \overline{BC}$.

\[ \frac{15}{9} = \frac{5}{3} \]
\[ \frac{25}{15} = \frac{5}{3} \]

$\triangle PNL \sim \triangle ALN$.

$\triangle ACO \sim \triangle BCA$.

$\frac{24}{18} = \frac{4}{3}$

$\angle 1 \cong \angle 2$. $\angle F = 45^\circ$.

A1 + Int + Any 6 Thm
A1A + thm.
Example 3: Given AC = 4, CD = 5, and AB = 6. Find BC if the perimeter \( \Delta BCD \) is 20.

Why is there not an ASA~ or AAS~?