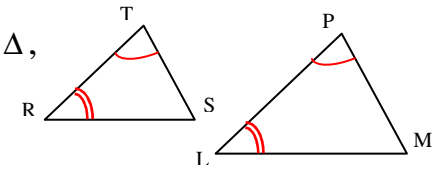
<name>
Class: Honors Geometry
Date: <date>
Topic: Lesson 8-3 (Proving Triangles Similar)

Postulate 8-1 AA~

Angle-Angle Similarity (AA~)

If $2\angle's$ of Δ are $\cong$ to $2\angle's$ of another Δ, then the $\Delta's$ are ~.

If $\angle T \cong \angle P$ & $\angle R \cong \angle L$ then $\Delta TRS \sim \Delta PLM$

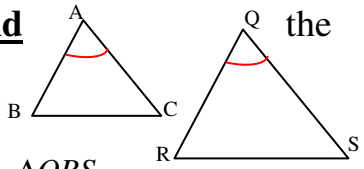


Theorem 8-1 SAS~

Side-Angle-Side Similarity (SAS~)

If an $\angle$ of 1Δ is $\cong$ to an $\angle$ of another Δ, **and** the sides incl the $\cong \angle's$ are proportional, then the $\Delta's$ are ~.

If $\angle A \cong \angle Q$ & $\frac{AB}{QR} = \frac{AC}{QS}$ then $\Delta ABC \sim \Delta QRS$

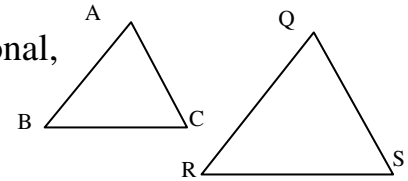


Theorem 8-2 SSS~

Side-Side-Side Similarity (SSS~)

If the corr sides of $2\Delta's$ are proportional, then the $\Delta's$ are ~.

If $\frac{AB}{QR} = \frac{AC}{QS} = \frac{BC}{RS}$ then $\Delta ABC \sim \Delta QRS$



Triangle Similarity Examples

1. $\overline{MX} \perp \overline{AB}$. Explain why $\Delta's$ are ~. Write a similarity stmt.

   Have $\angle$ info & no length info so look at AA~ & SAS~.

   $\angle AXM$ & $\angle BXK$ are right $\angle's$ and therefore are $\cong$.

   $m\angle A = m\angle B = 58, so \angle A \cong \angle B$

   We have two $\cong \angle's$ so we're done.

   Therefore $\Delta AXM \sim \Delta BXK$ by AA~ Postulate.

2. Explain why $\Delta's$ are ~. Write a similarity stmt.

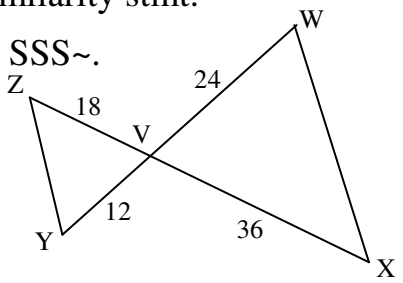
   Look for either AA~, SAS~ or SSS~.

   $\angle ZVY \cong \angle WVX$ (vert $\angle's$)

   Hmm, only $\angle$ set we have $\cong$ …

   $\frac{VY}{VW} = \frac{12}{24} = \frac{1}{2}$ & $\frac{VZ}{VX} = \frac{18}{36} = \frac{1}{2}$ so $\frac{VY}{VW} = \frac{VZ}{VX}$

   So $\Delta ZVY \sim \Delta XVW$ by SAS~ Theorem



<name>
Class: Honors Geometry
Date: <date>
Topic: Lesson 8-3 (Proving Triangles Similar)

3. *ABCD* is a parallelogram. Find *WY*.

Have lots of side len info so let's look for SAS~ or SSS~. Don't have the lens of all 3 sides so work on SAS~.

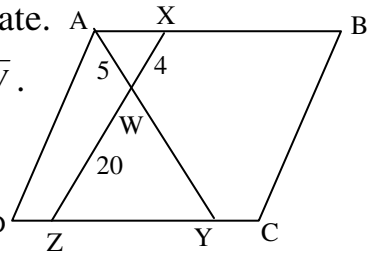
We first need to determine corresponding sides.

It's a parallelogram, so $\overline{AB} \parallel \overline{DC}$ with $\overline{AY}$ & $\overline{XZ}$ transv.

$\angle AXW \cong \angle YZW$ & $\angle WAX \cong \angle WYZ$ (alt. int. $\angle s$).

So $\Delta AXW \sim \Delta YZW$ by AA~ Postulate.

Thus, $\overline{XW}$ corr w/ $\overline{ZW}$ & $\overline{AW}$ w/ $\overline{YW}$.



We then have $\frac{AW}{WY} = \frac{XW}{ZW}$ and

$$\frac{AW}{WY} = \frac{5}{WY} \;\&\; \frac{XW}{ZW} = \frac{4}{20} = \frac{1}{5}$$

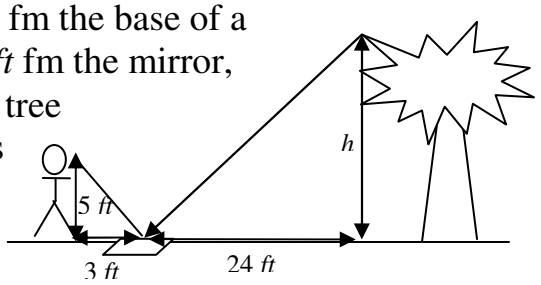
So $\frac{5}{WY} = \frac{1}{5}$; $WY = 5 \bullet 5 = 25$

Indirect Measurement

Using ~ Δ's to find measurements difficult to obtain directly. Light reflects off surf at same $\angle$ it hits the surf

Example

4. Joan places a mirror 24 *ft* fm the base of a tree. When she stands 3 *ft* fm the mirror, she can see the top of the tree reflected in it. If her eyes are 5 *ft* above the ground, how tall is the tree?



1st look for AA~, SAS~ or SSS~. Have 2 rt Δ's. Also the $\angle s$ formed at the mirror are $\cong$ (light reflection). Thus we have 2 $\cong \angle$'s so the 2 Δ's are ~ by the AA~ Postulate. The distance to the mirror legs correspond; the height legs correspond. Thus we have the following proportional statement:

$$\frac{5}{3} = \frac{h}{24};\; 3h = 5 \bullet 24;\; h = \frac{120}{3} = 40\,ft$$