Geometry
Unit 7 ~ Day 3 (v2)

Notes: ____________

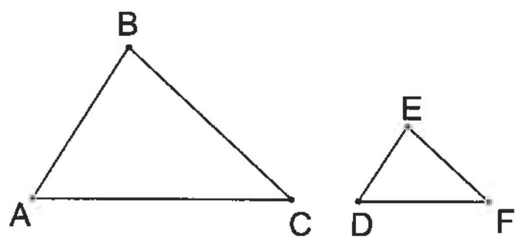
Practice Proportions and Products

1. **AA Similarity:** 2 pairs of corresponding <'s ≅

2. **SSS Similarity:** ratios of corr. sides proportional (=)

3. **SAS Similarity:** ratios of 2 pairs of corresponding sides = and the pair of included <'s ≅.

There are 3 Ways to End a Triangle Similarity Proof:



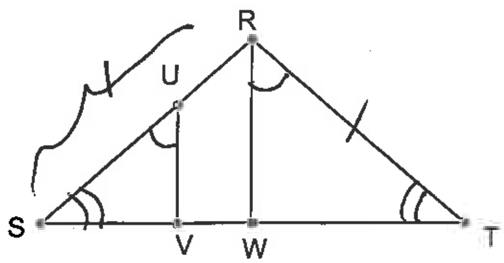
Asked to Prove:	Must Do This:
A Proportion i.e.) $\frac{AB}{DE} = \frac{AC}{DF}$	1. prove the Δ's are ≅ first. 2. Say the ratios are = because... "Ratios of corr. sides of similar polygons are =".
Equal Products Big Small Big Small i.e.) $AB \bullet DF = AC \bullet DE$ $\frac{AB}{DE} = \frac{AC}{DF}$	1. prove the Δ's similar 2. Give the proportion (by the reason above.) 3. State the products are equal (cross mult. the proportion) because: "the product of the means = product of the extremes"

postulate

$$\text{ie) } \overbrace{A : \underbrace{B = C}_{\text{means}} : D}^{\text{extremes}} \Rightarrow \frac{A}{B} = \frac{C}{D}$$

$$\Rightarrow \underbrace{(A)(D)}_{\text{product of extremes}} = \underbrace{(C)(B)}_{\text{product of means}}$$

Example:

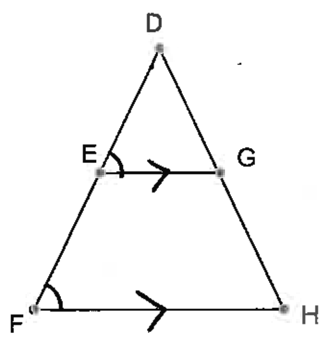


Given: $\overline{RS} \cong \overline{RT}$
$< SUV \cong < TRW$

Small Δ $\quad SU \quad SV$ ← ΔSUV
Prove: $\dfrac{SU}{TR} = \dfrac{SV}{TW}$
Big Δ. $\quad TR \quad TW$ ← ΔTRW

① $\overline{RS} \cong \overline{RT}$ $\angle SUV \cong \angle TRW$	① Given
② $\angle S \cong \angle T$	② in a Δ, < opp. ≅ sides are ≅.
③ $\Delta SUV \sim \Delta TRW$	③ AA similarity.
④ $\dfrac{SU}{TR} = \dfrac{SV}{TW}$	④ for two similar polygons, the ratios of corr. sides are =.

Example:



Given: $\overline{EG} \, / / \, \overline{FH}$

Prove: $DE \bullet FH = EG \bullet DF$
Small Big Small Big

⇓

$\dfrac{\text{Small}}{\text{Big}} \rightarrow \dfrac{DE}{DF} = \dfrac{EG}{FH}$ ← ΔDEG, ← ΔDFH

① $\overline{EG} \parallel \overline{FH}$	① Given
② $\angle DEG \cong \angle DFH$	② 2 // lines cut by trans. form corresponding <'s ≅.
③ $\angle D \cong \angle D$	③ Reflexive.
④ $\Delta DEG \sim \Delta DFH$	④ AA similarity.
⑤ $\dfrac{DE}{DF} = \dfrac{EG}{FH}$	⑤ Ratios of corr. sides of ~ Δ's are =.
⑥ $(DE)(FH) = (EG)(DF)$	⑥ In a proportion, the product of the means = product of the extremes.

Radicals Review

Perfect Squares: 1, 4, 9, 16, 25, 36, 49, 64, 81, 100, 121, 144, ... etc.

Write in simplest radical form:

1. $\sqrt{36} = \sqrt{6 \cdot 6} = \boxed{6}$

perfect square

2. $\sqrt{72} = \sqrt{36 \cdot 2} = \boxed{6\sqrt{2}}$

perfect square

3. $5\sqrt{108} = 5\sqrt{36 \cdot 3}$
$= (5)(6)\sqrt{3}$
$= \boxed{30\sqrt{3}}$

4. $\frac{2}{3}\sqrt{27} = \frac{2}{3}\sqrt{9 \cdot 3} = \frac{2}{3}(3)\sqrt{3} = \boxed{2\sqrt{3}}$

perfect square

5. $(3\sqrt{5})(2\sqrt{6}) = (3 \cdot 2)\sqrt{5 \cdot 6}$
$= \boxed{6\sqrt{30}}$

6. $(5\sqrt{7})^2 = (5\sqrt{7})(5\sqrt{7}) = 25\sqrt{49}$
$= 25(7)$
$\boxed{= 175}$

7. $\frac{\sqrt{80}}{\sqrt{125}} = \frac{\sqrt{16 \cdot 5}}{\sqrt{25 \cdot 5}}$
$= \frac{\sqrt{16}}{\sqrt{25}}$
$\boxed{= \frac{4}{5}}$

8. $\frac{2}{\sqrt{5}} \cdot \frac{\sqrt{5}}{\sqrt{5}} = \frac{2\sqrt{5}}{\sqrt{25}} = \boxed{\frac{2\sqrt{5}}{5}}$

$\sqrt{\ }$'s not allowed in the denominator