Geometry R – Mr. Bo
Unit 8 – Day 3 Notes

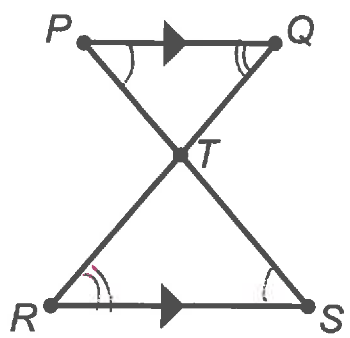
Name______________________________
Date____________________

Proving Triangles Similar

Triangle Similarity Theorems: **AA Similarity** **SAS Similarity** **SSS Similarity**

1a. Given: $\overline{PQ} // \overline{SR}$

a. Prove: $\Delta PQT \sim \Delta SRT$



S	R.
(1) $\overline{PQ} // \overline{SR}$	(1) Given
(2) $\angle P \cong \angle S$ $\angle Q \cong \angle R$	(2) 2 // lines cut by trans make alt. int $\angle$'s $\cong$.
(3) $\Delta PQT \sim \Delta SRT$	(5) AA Similarity.

b. Now that you know $\Delta PQT \sim \Delta SRT$, it must be true that $\frac{PT}{ST} = \frac{QT}{RT}$. Why?

the ratios of corr. sides of similar Δ's are =.

c. Now that you know $\frac{PT}{ST} = \frac{QT}{RT}$, then it must be true that $(PT)(RT) = (QT)(ST)$. Why?

In a proportion, the product of the means, equals the product of the extremes.

(the proportion postulate).

Small △ Big △ Small △ Big △.

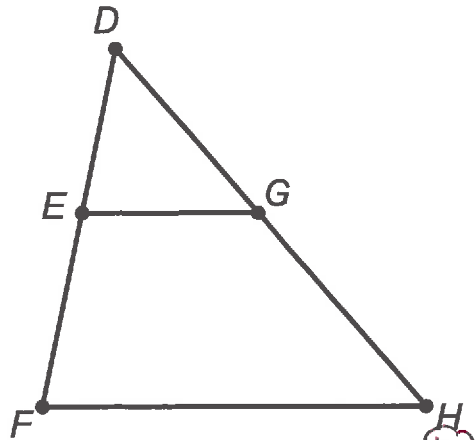
using Division we can create a proportion:

$$\frac{DE}{DF} = \frac{DG}{DH}.$$

these ratios are from corr. sides so we should use SAS similarity

2a. Given: $(DE)(DH) = (DG)(DF)$

Prove: $\Delta DEG \sim \Delta DFH$



S	R.
① $(DE)(DH) = (DG)(DF)$	① Given
② $\frac{DE}{DF} = \frac{DG}{DH}$	② Division
③ $\angle D \cong \angle D$	③ Reflexive.
④ $\Delta DEG \sim \Delta DFH$	④ SAS similarity.
part (b) → ⑤ $\frac{DE}{DF} = \frac{EG}{FH}$	⑤ Ratios corr. sides of ~ △'s are =.
part (c) → ⑥ $(DE)(FH) = (DF)(EG)$.	⑥ in a proportion, the prod. of means = prod of extremes.

b. Add the necessary steps to your proof to prove: $\frac{DE}{DF} = \frac{EG}{FH}$.

c. Add the necessary steps to your proof to prove: $(DE)(FH) = (DF)(EG)$

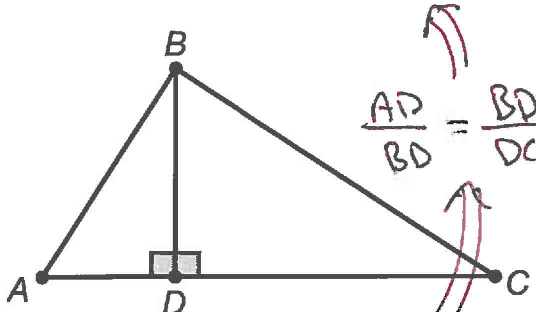
3. Given: $\angle ABD \cong \angle BCD$

$\overline{BD} \perp \overline{AC}$

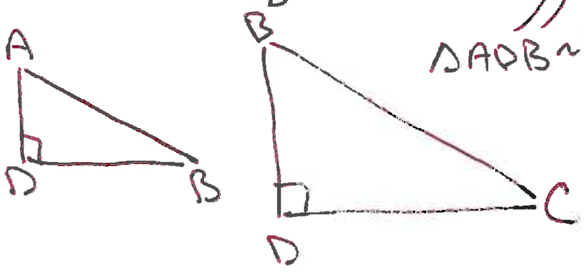
Prove: $(AD)(DC) = (BD)^2$

$(AD)(DC) = (BD)(BD)$

Small △ Big △ small △ big △.



$$\frac{AD}{BD} = \frac{BD}{DC}$$



$\Delta ADB \sim \Delta BDC$

S	R.
① $\angle ABD \cong \angle BCD$, $\overline{BD} \perp \overline{AC}$	① Given
② $\angle ADB$, $\angle CDB$ are Rt.	② ⊥ lines make Rt ∠'s.
③ $\angle ADB \cong \angle BDC$	③ Rt ∠'s ≅.
④ $\Delta ADB \sim \Delta BDC$	④ AA Similarity.
⑤ $\frac{AD}{BD} = \frac{BD}{DC}$	⑤ in similar △'s, the ratios of corr. sides are =.
⑥ $(AD)(DC) = (BD)(BD)$, $(AD)(DC) = (BD)^2$	⑥ in a proportion, the prod. of means = prod. of extremes.