

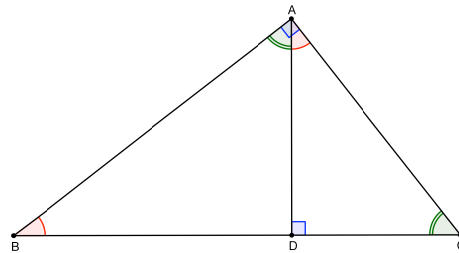
MT 453 Elements Day 30

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April 1, 2009

Proposition VI.8

If in right triangle a perpendicular drawn from the right angle to the base, the triangles adjoining the perpendicular are similar both to the whole and to one another.



Let $\triangle ABC$ be a right triangle. Draw AD perpendicular to BC .

Claim: 1) $\triangle ABD, \triangle ADC \sim \triangle ABC$ and 2) $\triangle ABD \sim \triangle ADC$.

Part I:

$\angle ADB = \angle BAC = \perp$; AB is common in both triangles; $\angle BAD = \angle C$.

$\therefore \triangle ABD$ is similar to $\triangle ABC$

Similarly, $\triangle ADC$ is similar to $\triangle ABC$ (VI.4)

Part II:

$\angle BAD = \angle C$; $\angle CAD = \angle B$; $\angle BDA = \angle CDA = \perp$

$\therefore \triangle BDA$ is similar to $\triangle ADC$ (VI.4).

Q.E.D

Porism: The perpendicular is a mean proportional between the segments of the bases.