

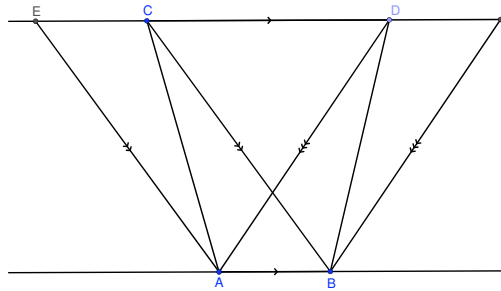
MT 453 Elements Day 12

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February 13, 2009

Proposition.I.37

Triangles which are on the same base and in the same parallels are equal to one another.



Let $\triangle CBA$ be on the same base and in the same parallels as $\triangle DAB$ namely CD and AB .

Claim: $\triangle CBA = \triangle DAB$

- 1) Produce CD in both directions to E and F . (Post 2)
- 2) Draw parallel line to CB through point A and label intersection point E . (I.31)
- 3) Draw parallel line to AD through point B and label intersection point F . (I.31)
- 4) $\diamond ECBA = \diamond FDAB$. (I.35)
- 5) CA bisects $\diamond ECBA$, $\triangle CBA = \frac{1}{2} \diamond ECBA$. (I.34)
- 6) DA bisects $\diamond FDAB$, $\triangle DAB = \frac{1}{2} \diamond FDAB$. (I.34)
- 7) $\triangle CBA = \triangle DAB$.

Q.E.D

Notes: There is a hidden common notion here that halves of equal things are equal so Euclid says the halves of equal triangles are equal.