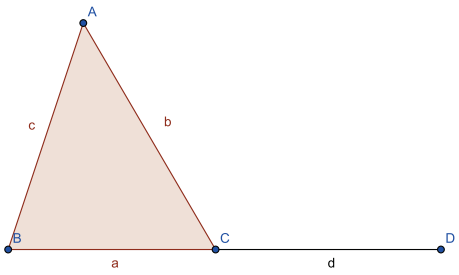
MT 453 Elements Day 6

Speaker: Erin Schubert
Scribes: Jill Cronin, Jacob Georgeson

January 30, 2009

Proposition I.17

The sum of two angles in a given triangle is less than two right angles.



Given $\triangle ABC$
Extend BC to point D. [Postulate 2]
Label the following angles: $\angle ACD = \alpha$, $\angle ACB = \beta$,
$\angle CBA = \gamma$, and $\angle BAC = \delta$.
$\alpha > \gamma$ [Proposition I.16]
$\alpha + \beta = \gamma + \beta$ [C.N. 2]
$\alpha + \beta = \lrcorner\lrcorner$ [Proposition I.13] $\gamma + \beta < \lrcorner\lrcorner$
Similarly, we can extend the other sides to get $\gamma + \delta < \lrcorner\lrcorner$ and $\delta + \beta < \lrcorner\lrcorner$.

Q.E.F.

Comment: 1. The original configuration of the triangle here is general, so it is not necessary to go through the proof again to show that $\gamma + \delta < \llcorner\llcorner$ and $\delta + \beta < \llcorner\llcorner$. We can simply assume that the proof could proceed in the same way.