MT 453 Elements Proposition I.11

Presenter: Tobias
Scribe: Annie, Artist: Sarah
September 10, 2018

Proposition I.11

To draw a straight line at right angles to a given straight line from a given point on it

Steps:
1. Let $AB$ be the given straight line and $C$ the point on it
2. Take a point $D$ on $AC$
3. Make $CE$ equal to $DC$ [Proposition I.3]
4. Construct an equilateral triangle called $\triangle FDE$ on $DE$ [Proposition I.1]
5. Connect $F$ and $C$ to create $FC$

Claim: $FC$ is at right angles to $DC$ and $CE$

Proof:
Because $DC = CE$, $CF = CF$, by construction, $DF = EF$
By Proposition I.8, we know $\angle DCF = \angle ECF$
By Definition 10, two equal adjacent angles on a straight line are both right angles.
Q.E.F.