

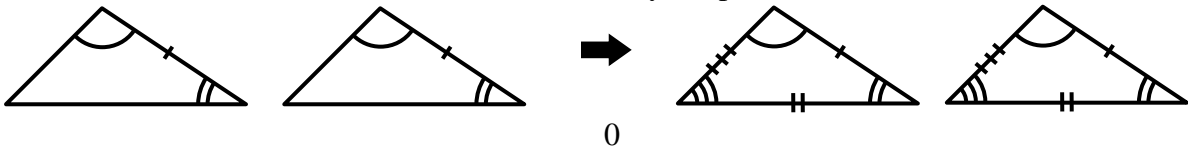
Class Drill for Section 7.2: The Angle Side Angle Congruence Theorem

Justify the steps in the proof of the following theorem. (Your justifications may refer to any prior theorem and to Axioms <N1> through <N10>.) See the proof in the textbook for drawings.

Theorem 54 the ASA Congruence Theorem for Neutral Geometry

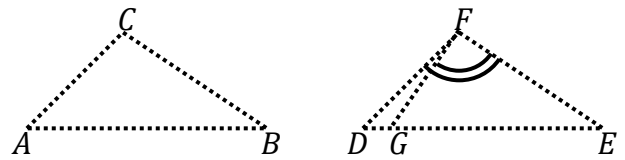
In Neutral Geometry, if there is a one-to-one correspondence between the vertices of two triangles, and two angles and the included side of one triangle are congruent to the corresponding parts of the other triangle, then all the remaining corresponding parts are congruent as well, so the correspondence is a congruence and the triangles are congruent.

Remark: The statement of the theorem can be illustrated by the picture below.

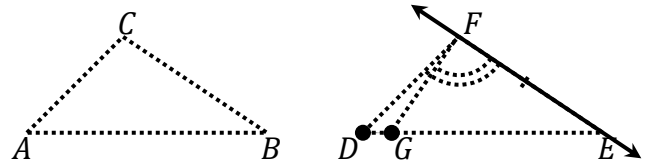


<p>Proof</p> <p>(1) Suppose that $\triangle ABC$ and $\triangle DEF$ are given such that $\angle ABC \cong \angle DEF$ and $\overline{BC} \cong \overline{EF}$ and $\angle BCA \cong \angle EFD$.</p>	
<p>(2) There exists a point G on ray \overrightarrow{ED} such that $\overline{EG} \cong \overline{BA}$. (Justify.)</p> <p>(We suspect that G is the same point as D, but we have not yet proven that, so we should not draw it that way.)</p>	
<p>(3) $\triangle GEF \cong \triangle ABC$. (Justify.)</p>	
<p>(4) $\angle EFG \cong \angle BCA$. (Justify.)</p>	

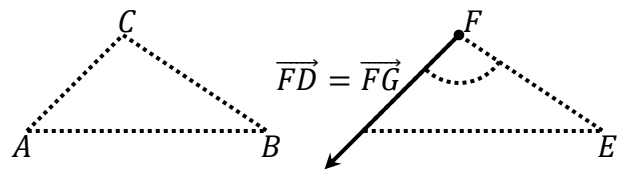
(5) $\angle EFG \cong \angle EFD$. (Justify.)



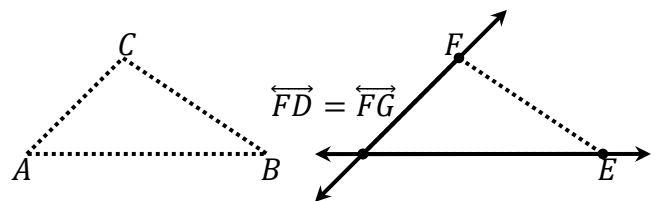
(6) Points D and G are on the same side of line \overleftrightarrow{EF} . (Justify.)



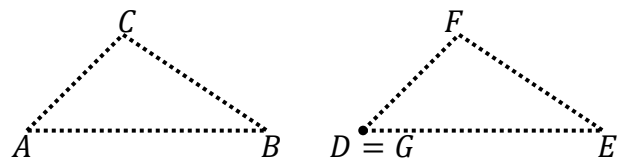
(7) Ray \overrightarrow{FD} must be the same ray as \overrightarrow{FG} . (Justify.)



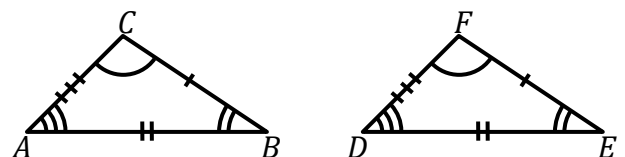
(8) Line \overleftrightarrow{DF} can only intersect line \overleftrightarrow{DE} at a single point. (Justify.)



(9) Points D, G must be the same point. (Justify.)



(10) $\triangle DEF \cong \triangle ABC$. (Justify.)



End of proof