# 4-5 Other Methods of Proving Triangles Congruent

The SSS, SAS, and ASA Postulates give us three methods of proving triangles congruent. In this section we will develop two other methods.

Theorem 4-3 AAS Theorem

If two angles and a non-included side of one triangle are congruent to the corresponding parts of another triangle, then the triangles are congruent.

Given: $\triangle ABC$ and $\triangle DEF$; $\angle B \cong \angle E$;
$\angle C \cong \angle F$; $\overline{AC} \cong \overline{DF}$

Prove: $\triangle ABC \cong \triangle DEF$
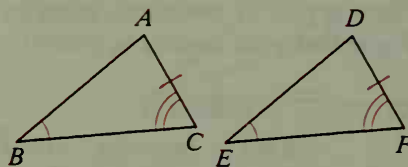
Plan for Proof: You can prove the triangles congruent if you can apply one of the SSS, SAS, or ASA Postulates. You can use the ASA Postulate if you first show that $\angle A \cong \angle D$. To do that, use the fact that the other two angles of $\triangle ABC$ are congruent to the other two angles of $\triangle DEF$.

Do you see overlapping triangles in the photograph? Sometimes you want to prove that certain overlapping triangles are congruent. For example, suppose you have the following problem:

Given: $\overline{GJ} \cong \overline{GK}$;
$\angle H \cong \angle I$

Prove: $\triangle GHJ \cong \triangle GIK$
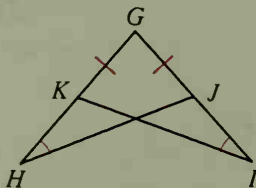
You may find it helps you visualize the congruence if you redraw the two triangles, as shown below. Now you can see that since $\angle G$ is common to both triangles, the triangles must be congruent by the AAS Theorem.