

# Geometry

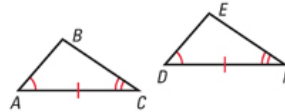
## Notes Section 4.6

### Prove Triangles Congruent by ASA and AAS

**POSTULATE 21** Angle-Side-Angle (ASA) Congruence Postulate

If two angles and the included side of one triangle are congruent to two angles and the included side of a second triangle, then the two triangles are congruent.

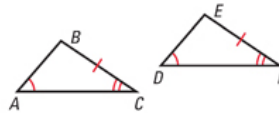
If Angle  $\angle A \cong \angle D$ ,  
 Side  $\overline{AC} \cong \overline{DF}$ , and  
 Angle  $\angle C \cong \angle F$ ,  
 then  $\triangle ABC \cong \triangle DEF$ .



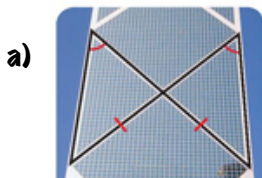
**THEOREM 4.6** Angle-Angle-Side (AAS) Congruence Theorem

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

If Angle  $\angle A \cong \angle D$ ,  
 Angle  $\angle C \cong \angle F$ , and  
 Side  $\overline{BC} \cong \overline{EF}$ ,  
 then  $\triangle ABC \cong \triangle DEF$ .



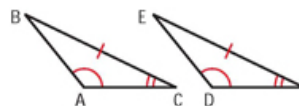
**EXAMPLE 1** Can the triangles be proven congruent with the information given in the diagram? If so, state the postulate or theorem.



**EXAMPLE 2** Complete the following proof

a) Given:  $\angle A \cong \angle D$ ,  $\angle C \cong \angle F$ ,  $\overline{BC} \cong \overline{EF}$

Prove:  $\triangle ABC \cong \triangle DEF$

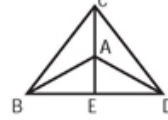


1.  $\angle A \cong \angle D$ ,  $\angle C \cong \angle F$
2.  $\overline{BC} \cong \overline{EF}$
3.  $\angle B \cong \angle E$
4.  $\triangle ABC \cong \triangle DEF$

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_

b) Given:  $CE \perp BD$ ,  $\angle CAB \cong \angle CAD$

Prove:  $\triangle ABE \cong \triangle ADE$



1.  $CE \perp BD$

2.  $m\angle AEB = m\angle AED = 90^\circ$

3.  $\angle AEB \cong \angle AED$

4.  $\angle CAB \cong \angle CAD$

5.  $\angle BAE$  and  $\angle CAB$  are supplementary angles

$\angle DAE$  and  $\angle CAD$  are supplementary angles

6.  $\angle DAE$  and  $\angle CAB$  are supplementary angles

7.  $\angle BAE \cong \angle DAE$

8.  $AE \cong AE$

9.  $\triangle ABE \cong \triangle ADE$

1. \_\_\_\_\_

2. \_\_\_\_\_

3. \_\_\_\_\_

4. \_\_\_\_\_

5. \_\_\_\_\_

6. \_\_\_\_\_

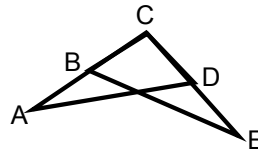
7. \_\_\_\_\_

8. \_\_\_\_\_

9. \_\_\_\_\_

c) Given:  $\angle CBF \cong \angle CDF$ ,  $BF \cong FD$

Prove:  $\triangle ABF \cong \triangle EDF$



1.  $\angle CBF \cong \angle CDF$

2.  $\angle CBF$  and  $\angle ABF$  are supplementary angles

$\angle CDF$  and  $\angle EDF$  are supplementary angles

3.  $\angle CBF$  and  $\angle EDF$  are supplementary angles

4.  $\angle ABF \cong \angle EDF$

5.  $BF \cong FD$

6.  $\angle ABF \cong \angle EDF$

7.  $\triangle ABF \cong \triangle EDF$

1. \_\_\_\_\_

2. \_\_\_\_\_

3. \_\_\_\_\_

4. \_\_\_\_\_

5. \_\_\_\_\_

6. \_\_\_\_\_

7. \_\_\_\_\_