November 04, 2015

# Honors Geometry

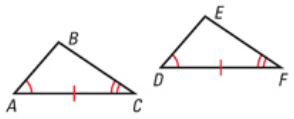
## Notes Section 4.6

### 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.

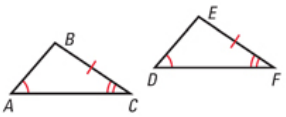
If Angle $\angle A \cong \angle D$,
Side $\overline{AC} \cong \overline{DF}$, and
Angle $\angle C \cong \angle F$,
then $\triangle ABC \cong \triangle DEF$.



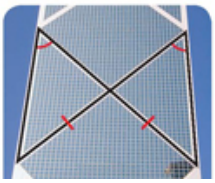

**THEOREM 4.6** **Angle-Angle-Side (AAS) Congruence Theorem**

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 $\triangle ABC \cong \triangle DEF$.



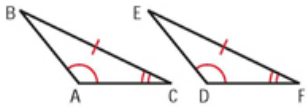

**EXAMPLE 1** Can the triangles be proven congruent with the information given in the diagram? If so, state the postulate or theorem.

a) 

b) 

c) 

**EXAMPLE 2** Complete the following proo



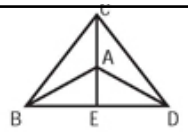

a) Given: $\angle A \cong \angle D$, $\angle C \cong \angle F$, $BC \cong EF$

Prove: $\Delta ABC \cong \Delta DEF$

| | |
|---|---|
| 1. $\angle A \cong \angle D$, $\angle C \cong \angle F$ | 1. _____ |
| 2. $BC \cong EF$ | 2. _____ |
| 3. $\angle B \cong \angle E$ | 3. _____ |
| 4. $\Delta ABC \cong \Delta DEF$ | 4. _____ |

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

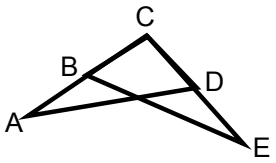
Prove: $\Delta ABE \cong \Delta ADE$




| | |
|---|---|
| 1. $CE \perp BD$ | 1. _____ |
| 2. $m\angle AEB = m\angle AED = 90°$ | 2. _____ |
| 3. $\angle AEB \cong \angle AED$ | 3. _____ |
| 4. $\angle CAB \cong \angle CAD$ | 4. _____ |
| 5. $\angle BAE$ and $\angle CAB$ are supplementary angles<br>$\angle DAE$ and $\angle CAD$ are supplementary angles | 5. _____ |
| 6. $\angle BAE \cong \angle DAE$ | 6. _____ |
| 7. $AE \cong AE$ | 7. _____ |
| 8. $\Delta ABE \cong \Delta ADE$ | 8. _____ |

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

Prove: $\Delta ABF \cong \Delta EDF$




| | |
|---|---|
| 1. $\angle CBF \cong \angle CDF$ | 1. _____ |
| 2. $\angle CBF$ and $\angle ABF$ are supplementary angles<br>$\angle CDF$ and $\angle EDF$ are supplementary angles | 2. _____ |
| 3. $\angle ABF \cong \angle EDF$ | 3. _____ |
| 4. $BF \cong FD$ | 4. _____ |
| 5. $\angle BFA \cong \angle DFE$ | 5. _____ |
| 6. $\Delta ABF \cong \Delta EDF$ | 6. _____ |