

# Geometry

## Chapter 4 Section 4-3 (4-4)

# Angle-Side-Angle

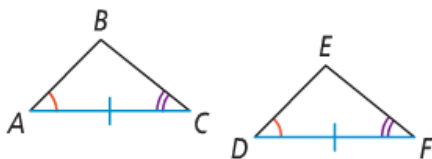
### Postulate 4-3 Angle-Side-Angle (ASA) Postulate

#### Postulate

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

If ...

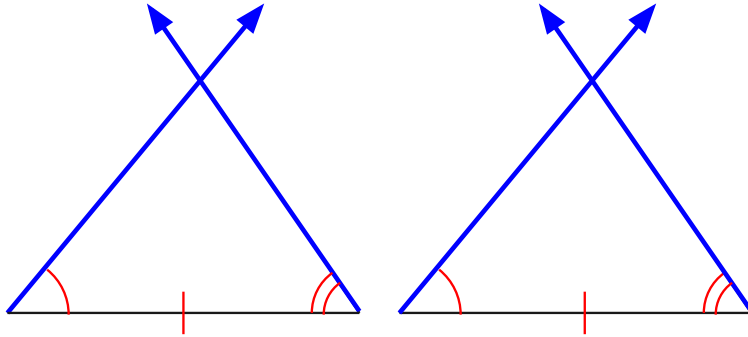
$$\begin{aligned} \angle A &\cong \angle D, \overline{AC} \cong \overline{DF}, \\ \angle C &\cong \angle F \end{aligned}$$



Then ...

$$\triangle ABC \cong \triangle DEF$$

# Angle-Side-Angle



# Angle-Angle-Side

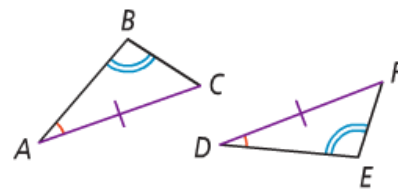
## Theorem 4-2 Angle-Angle-Side (AAS) Theorem

### Theorem

If two angles and a nonincluded side of one triangle are congruent to two angles and the corresponding nonincluded side of another triangle, then the triangles are congruent.

If ...

$$\begin{aligned} \angle A &\cong \angle D, \angle B \cong \angle E, \\ \overline{AC} &\cong \overline{DF} \end{aligned}$$

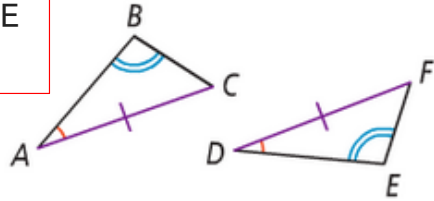


Then ...

$$\triangle ABC \cong \triangle DEF$$

# Proof of Angle-Angle-Side Theorem

Given:  $\overline{AC} \cong \overline{DF}$ ,  $\angle A \cong \angle D$ ,  $\angle B \cong \angle E$   
 Prove:  $\triangle ABC \cong \triangle DEF$



$\overline{AC} \cong \overline{DF}$ ,  $\angle A \cong \angle D$ ,  $\angle B \cong \angle E$

Given

$\angle C \cong \angle F$

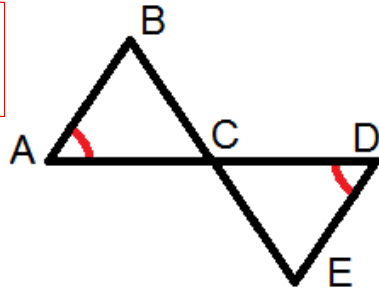
Third Angle Theorem

$\triangle ABC \cong \triangle DEF$

Angle-Side-Angle

## Proofs

Given:  $\angle A \cong \angle D$ , C is the midpoint of BE  
 Prove:  $\triangle ABC \cong \triangle DEC$



$\angle A \cong \angle D$ , C is the midpoint of BE

Given

$\angle ACB \cong \angle DCE$

Vertical Angles

$\overline{BC} \cong \overline{CE}$

Def of midpoint

$\triangle ABC \cong \triangle DEC$

Angle-Angle-Side

# Proofs

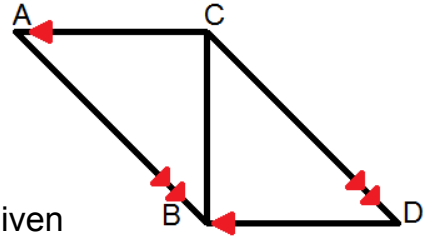
Given:  $AC \parallel BD$ ,  $AB \parallel CD$   
Prove:  $\triangle ABC \cong \triangle DCB$

$AC \parallel BD$ ,  $AB \parallel CD$

$\angle ACB \cong \angle CBD$ ,  $\angle ABC \cong \angle DCB$

$\overline{CB} \cong \overline{CB}$

$\triangle ABC \cong \triangle DCB$



Given

Alternate Interior Angles

Reflexive

Angle-Side-Angle

# Proofs

Given:  $AC \parallel BD$ ,  $AB \parallel CD$   
Prove:  $\angle A \cong \angle D$

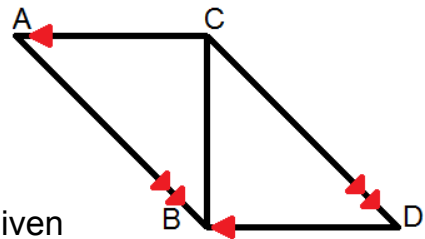
$AC \parallel BD$ ,  $AB \parallel CD$

$\angle ACB \cong \angle CBD$ ,  $\angle ABC \cong \angle DCB$

$\overline{CB} \cong \overline{CB}$

$\triangle ABC \cong \triangle DCB$

$\angle A \cong \angle D$



Given

Alternate Interior Angles

Reflexive

Angle-Side-Angle

Corresponding Parts of  $\triangle$

# Homework

**Pages 238-240 #11, 14, 15, 19, 25-27**  
**Page 247 #9, 10, 16, 19**