

LESSON
4.6

Study Guide

For use with pages 256–263

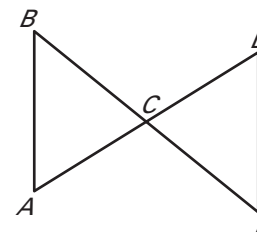
GOAL Use congruent triangles to prove corresponding parts congruent.

EXAMPLE 1 Identify congruent triangles

Explain how you can use the given information and congruent triangles to prove the statement.

GIVEN: $\overline{AB} \parallel \overline{DE}$, $\overline{AB} \cong \overline{DE}$

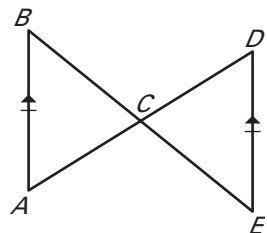
PROVE: C is the midpoint of \overline{BE} .



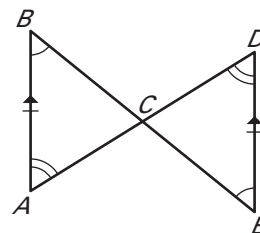
Solution

If you can show that $\triangle ABC \cong \triangle DEC$, you will know that C is the midpoint of \overline{BE} . First, copy the diagram and mark the given information. Then add the information that you can deduce. In this case, $\angle B \cong \angle E$ and $\angle A \cong \angle D$ by the Alternate Interior Angles Theorem.

Mark given information.



Add deduced information

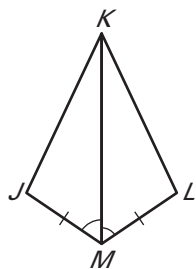


Two angle pairs and the included sides are congruent, so by the ASA Congruence Postulate, $\triangle ABC \cong \triangle DEC$. Because corresponding parts of congruent triangles are congruent, $\overline{BC} \cong \overline{CE}$. By the definition of midpoint, C is the midpoint of \overline{BE} .

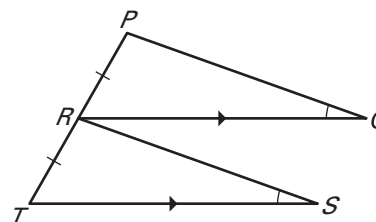
Exercises for Example 1

Tell which triangles you can show are congruent in order to prove the statement. What postulate or theorem would you use?

1. $\overline{JK} \cong \overline{LK}$



2. $\angle RPQ \cong \angle TRS$

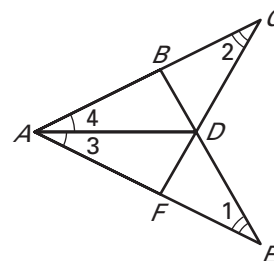


LESSON
4.6**Study Guide** *continued*
For use with pages 256–263**EXAMPLE 2** Plan a proof involving pairs of triangles

Use the given information to write a plan for a proof.

GIVEN: $\angle 1 \cong \angle 2$, $\angle 3 \cong \angle 4$

PROVE: $\triangle DEF \cong \triangle DCB$

**Solution**

In $\triangle DEF$ and $\triangle DCB$, you know $\angle 1 \cong \angle 2$. If you can show that $\angle EDF \cong \angle CDB$ and $\overline{ED} \cong \overline{CD}$, you can use the SAS Congruence Postulate.

Because $\angle EDF$ and $\angle CDB$ are vertical angles, $\angle EDF \cong \angle CDB$ by the Vertical Angles Theorem.

To prove that $\overline{ED} \cong \overline{CD}$, you can first prove that $\triangle AED \cong \triangle ACD$. You are given $\angle 1 \cong \angle 2$ and $\angle 3 \cong \angle 4$. $\overline{AD} \cong \overline{AD}$ by the Reflexive Property. You can use the ASA Congruence Postulate to prove that $\triangle AED \cong \triangle ACD$.

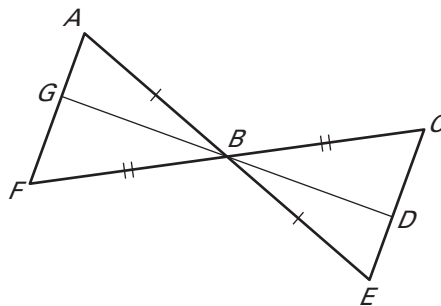
Plan for Proof: Use the ASA Congruence Postulate to prove that $\triangle AED \cong \triangle ACD$. Then state that $\overline{DE} \cong \overline{DC}$ because corresponding parts of congruent triangles are congruent. Use the ASA Congruence Postulate to prove that $\triangle DEF \cong \triangle DCB$.

Exercises for Example 2

Use the diagram and the given information to write a plan for a proof.

3. **GIVEN:** $\overline{AB} \cong \overline{EB}$, $\overline{FB} \cong \overline{CB}$

PROVE: $\overline{BG} \cong \overline{BD}$



4. **GIVEN:** $\overline{RS} \cong \overline{ST}$, $\overline{PU} \cong \overline{PQ}$

$\angle UPT \cong \angle QPR$

PROVE: $\triangle PTU \cong \triangle PRQ$

