

# Chapter 4

## Congruent Triangles

# Section 5

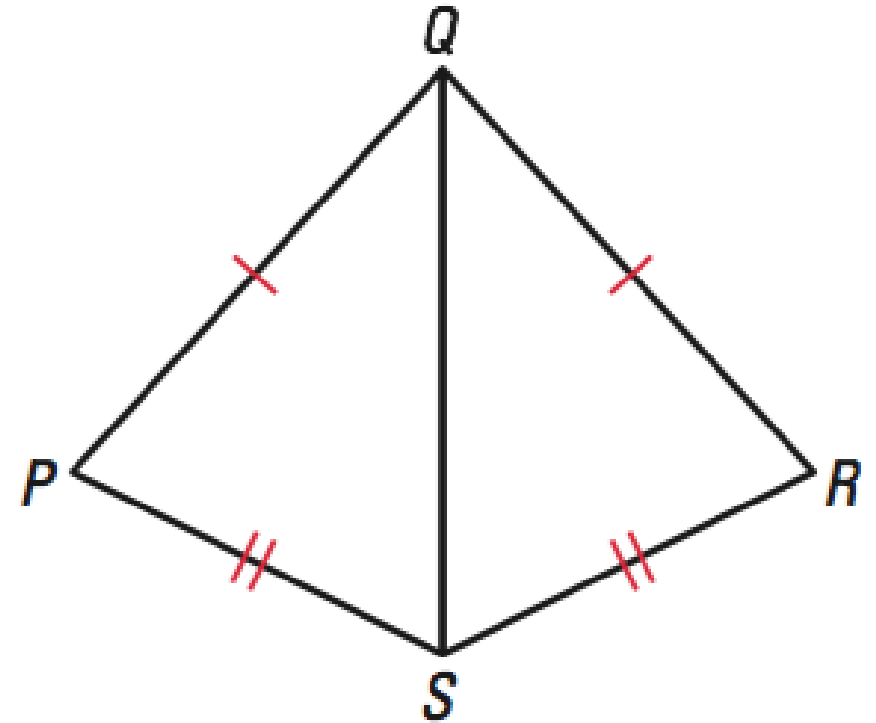
## Using Congruent Triangles

## GOAL 1: Planning a Proof

C.P.C.T.C

Knowing that all pairs of **corresponding parts of congruent triangles are congruent** can help you reach conclusions about congruent figures.

For instance, suppose you want to prove that  $\angle PQS \cong \angle RQS$  in the diagram shown at the right. One way to do this is to show that  $\triangle PQS \cong \triangle RQS$  by the SSS Congruence Postulate. Then you can use the fact that corresponding parts of congruent triangles are congruent to conclude that  $\angle PQS \cong \angle RQS$ .



## Example 1: Planning and Writing a Proof

**GIVEN** ►  $\overline{AB} \parallel \overline{CD}, \overline{BC} \parallel \overline{DA}$

**PROVE** ►  $\overline{AB} \cong \overline{CD}$

**Plan for Proof** Show that  $\triangle ABD \cong \triangle CDB$ .  
Then use the fact that corresponding parts of congruent triangles are congruent.

Statements

1)  $AB \parallel CD, BC \parallel DA$

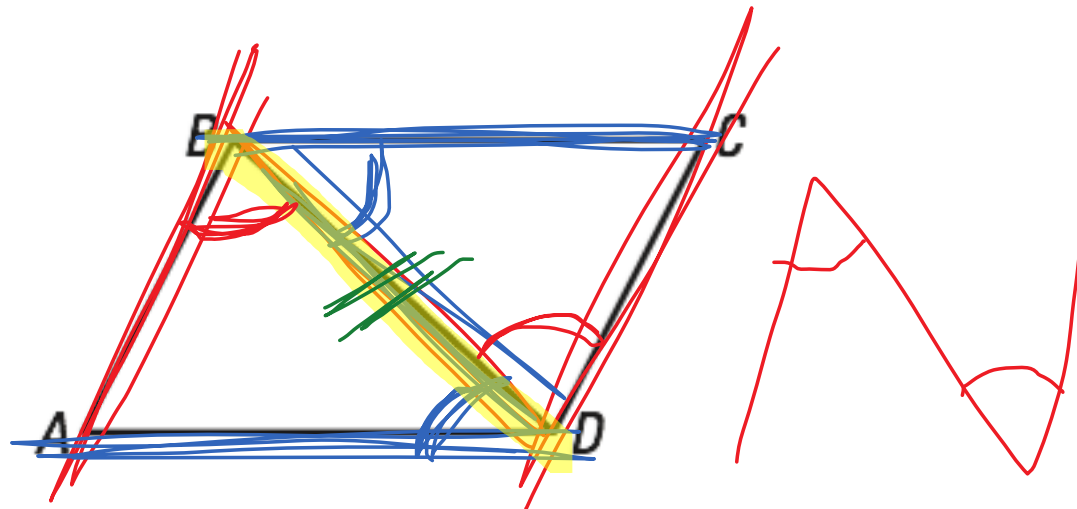
2)  $\angle ABD \cong \angle CDB$  A

3)  $\angle ADB \cong \angle CBD$  A

4)  $BD \cong DB$  S

5) Tri. ABD  $\cong$  Tri. CDB

6)  $AB \cong CD$



Reasons

1) Given

2) AI  AAS

3) AI  ASA

4) Reflexive (Overlapping sides)

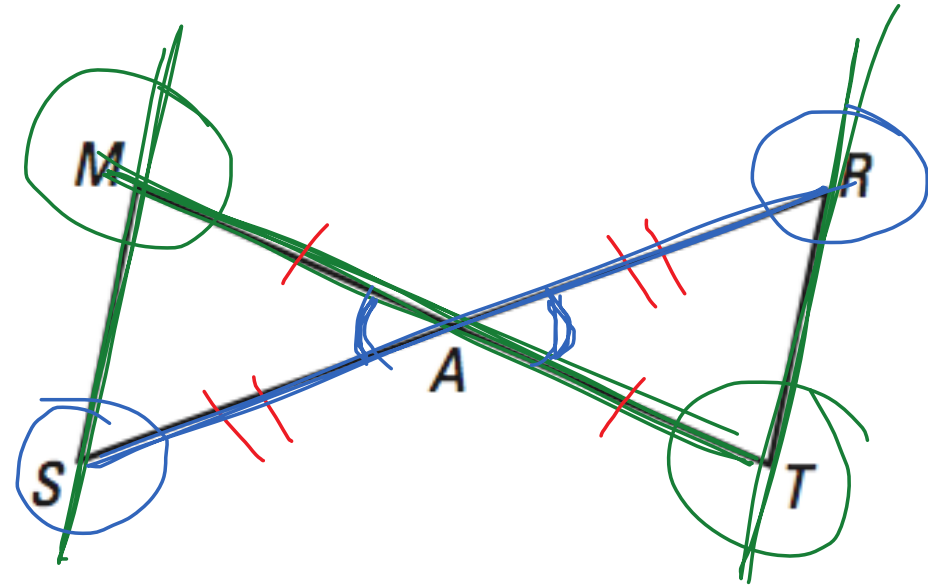
5) ASA

6) CPCTC

## Example 2: Planning and Writing a Proof

**GIVEN** ►  $A$  is the midpoint of  $\overline{MT}$ ,  
 $A$  is the midpoint of  $\overline{SR}$ .

**PROVE** ►  $\overline{MS} \parallel \overline{TR}$



Statements

- 1)  $A$  is midpt of  $MT$ ,  $A$  is midpt of  $SR$
- 2)  $MA \cong TA$ ,  $SA \cong RA$
- 3)  $\angle MAS \cong \angle TAR$
- 4)  $\triangle MAS \cong \triangle TAR$
- 5)  $\angle M \cong \angle T$  ( $\angle S \cong \angle R$ )
- 6)  $MS \parallel TR$

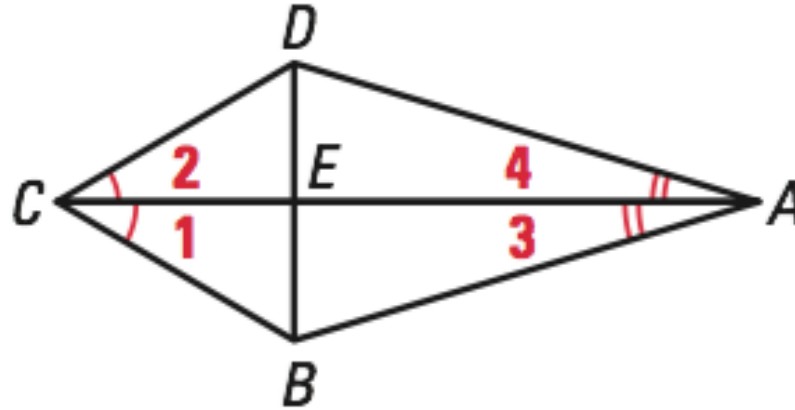
Reasons

- 1) Given
- 2) Def. of midpoint
- 3) Vertical  $\angle$ 's
- 4) SAS
- 5) CPCTC
- 6) AI CONVERSE

### Example 3: Using More than One Pair of Triangles

**GIVEN** ►  $\angle 1 \cong \angle 2$   
 $\angle 3 \cong \angle 4$

**PROVE** ►  $\triangle BCE \cong \triangle DCE$



Statements

- 1)  $\angle 1 \cong \angle 2$ ,  $\angle 3 \cong \angle 4$
- 2)  $AC \cong AC$
- 3)  $\triangle ABC \cong \triangle ADC$
- 4)  $BC \cong DC$
- 5)  $CE \cong CE$
- 6)  $\triangle BCE \cong \triangle DCE$

Reasons

- 1) given
- 2) Reflexive (O.S.)
- 3) ASA
- 4) CPCTC
- 5) Reflexive (O.S.)
- 6) SAS

EXIT SLIP