

# Proving Statements about Segments

## Properties of Segment Congruence

Reflexive - For any segment  $AB$ ,  $\overline{AB} \cong \overline{AB}$ .

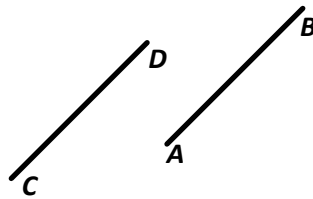
Symmetric - If  $\overline{AB} \cong \overline{CD}$ , then  $\overline{CD} \cong \overline{AB}$ .

Transitive - If  $\overline{AB} \cong \overline{CD}$  and  $\overline{CD} \cong \overline{EF}$ , then  $\overline{AB} \cong \overline{EF}$ .

1. For the following proof, name the property that justifies each statement.

Given:  $\overline{AB} \cong \overline{CD}$

Prove:  $\overline{CD} \cong \overline{AB}$



Statement

Reason

1.  $\overline{AB} \cong \overline{CD}$

2.  $AB = CD$

3.  $CD = AB$

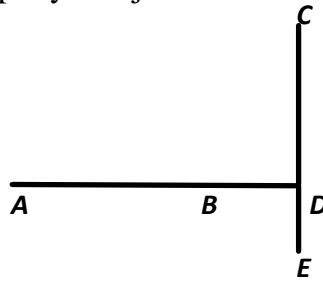
4.  $\overline{CD} \cong \overline{AB}$

2. For the following proof, name the property that justifies each statement.

Given:  $\overline{AB} \cong \overline{CD}$

$\overline{BD} \cong \overline{DE}$

Prove:  $\overline{AD} \cong \overline{CE}$



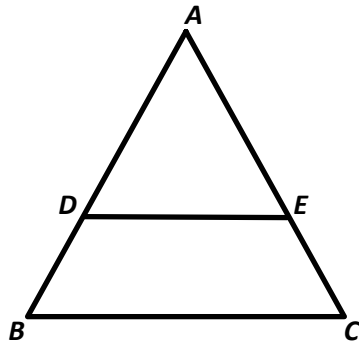
<u>Statement</u>	<u>Reason</u>
1. $\overline{AB} \cong \overline{CD}$ $\overline{BD} \cong \overline{DE}$	
2. $AB = CD$ $BD = DE$	
3. $AD = AB + BD$ $CE = CD + DE$	
4. $AB + BD = CD + DE$	
5. $AD = CE$	
6. $\overline{AD} \cong \overline{CE}$	

3. Write a two-column proof.

Given:  $\overline{AB} \cong \overline{AC}$

$\overline{DB} \cong \overline{EC}$

Prove:  $\overline{AD} \cong \overline{AE}$



4. Write a two-column proof.

Given:  $\overline{AB} \cong \overline{CD}$

$\overline{EC} \cong \overline{EB}$

Prove:  $\overline{AE} \cong \overline{DE}$

