

## 2-7 Skills Practice

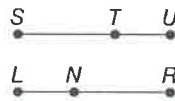
### Proving Segment Relationships

Justify each statement with a property of equality, a property of congruence, or a postulate.

- $QA = QA$  Reflexive Property of equality
- If  $\overline{AB} \cong \overline{BC}$  and  $\overline{BC} \cong \overline{CE}$  then  $\overline{AB} \cong \overline{CE}$ . Transitive property of congruence
- If  $Q$  is between  $P$  and  $R$ , then  $PR = PQ + QR$ . segment addition postulate
- If  $AB + BC = EF + FG$  and  $AB + BC = AC$ , then  $EF + FG = AC$ . Substitution or transitive

**PROOF** Complete each proof.

5. Given:  $\overline{SU} \cong \overline{LR}$   
 $\overline{TU} \cong \overline{LN}$



Prove:  $\overline{ST} \cong \overline{NR}$

**Proof:**

**Statements**

- $\overline{SU} \cong \overline{LR}, \overline{TU} \cong \overline{LN}$
- $\overline{SU} = \overline{LR}, \overline{TU} = \overline{LN}$
- $SU = ST + TU$   
 $LR = LN + NR$
- $ST + TU = LN + NR$
- $ST + LN = LN + NR$
- $ST + LN - LN = LN + NR - LN$
- $ST = NR$
- $\overline{ST} \cong \overline{NR}$

**Reasons**

- Given
- Definition of  $\cong$  segments
- Segment Addition Postulate
- Transitive / Substitution
- Substitution
- Subtraction
- Substitution Property
- definition of congruence  $\equiv$

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

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

**Proof:**

**Statements**

- $\overline{AB} \cong \overline{CD}$
- $AB = CD$
- $CD = AB$
- $\overline{CD} \cong \overline{AB}$

**Reasons**

- Given
- Definition of congruence
- Symmetric property
- Definition of  $\cong$  segments

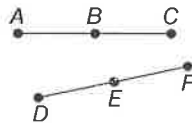
**Q.E.D.**

## 2-7 Practice

### Proving Segment Relationships

Complete the following proof.

1. Given:  $\overline{AB} \cong \overline{DE}$   
 B is the midpoint of  $\overline{AC}$ .  
 E is the midpoint of  $\overline{DF}$ .

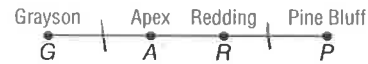


Prove:  $\overline{BC} \cong \overline{EF}$

Proof:

Statements	Reasons
a. $\overline{AB} \cong \overline{DE}$	a. Given
B is the midpoint of $\overline{AC}$	
E is the midpoint of $\overline{DF}$	
b. $AB = DE$	b. Definition of congruence
c. $\overline{AB} = \overline{BC}$	c. Definition of Midpoint
$\overline{DE} = \overline{EF}$	
d. $BC = DE$	d. Transitive
e. $BC = EF$	e. Transitive
f. $\overline{BC} \cong \overline{EF}$	f. Definition of congruence

2. TRAVEL Refer to the figure. DeAnne knows that the distance from Grayson to Apex is the same as the distance from Redding to Pine Bluff. Prove that the distance from Grayson to Redding is equal to the distance from Apex to Pine Bluff.



QED

1.  $\overline{GA} = \overline{RP}$  Given
2.  $\overline{AR} = \overline{AR}$  Reflexive
3.  $\overline{GA} + \overline{AR} = \overline{RP} + \overline{AR}$  Addition
4.  $\overline{GA} + \overline{AR} = \overline{GR}$  Segment Addition Postulate  
 $\overline{RP} + \overline{AR} = \overline{AP}$
5.  $\overline{GR} = \overline{AP}$  Substitution //