



2-7

Skills Practice

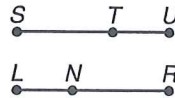
Proving Segment Relationships

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

1.  $QA = QA$  *Reflexive Property*
2. If  $\overline{AB} \cong \overline{BC}$  and  $\overline{BC} \cong \overline{CE}$ , then  $\overline{AB} \cong \overline{CE}$ .  
*Transitive Property*
3. If  $Q$  is between  $P$  and  $R$ , then  $PR = PQ + QR$ .  
*Segment Addition Postulate*
4. If  $AB + BC = EF + FG$  and  $AB + BC = AC$ , then  $EF + FG = AC$ .  
*Substitution*

Complete each proof.

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



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

Proof:

Statements	Reasons
a. $\overline{SU} \cong \overline{LR}, \overline{TU} \cong \overline{LN}$	a. <u>Given</u>
b. $SU = LR$ $TU = LN$	b. Definition of $\cong$ segments
c. $SU = ST + TU$ $LR = LN + NR$	c. <u>Segment Addition Postulate</u>
d. $ST + TU = LN + NR$	d. <u>Substitution</u>
e. $ST + LN = LN + NR$	e. <u>Substitution</u>
f. $ST + LN - LN = LN + NR - LN$	f. <u>Subtraction Property</u>
g. $ST = NR$	g. Substitution Property
h. $\overline{ST} \cong \overline{NR}$	h. <u>Definition of Congruent Segments</u>

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

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

Proof:

Statements	Reasons
a. $\overline{AB} \cong \overline{CD}$	a. Given
b. $AB = CD$	b. <u>Definition of <math>\cong</math> segments</u>
c. $CD = AB$	c. <u>Symmetric Property</u>
d. $\overline{CD} \cong \overline{AB}$	d. Definition of $\cong$ segments

## 2-7 Practice

## Proving Segment Relationships

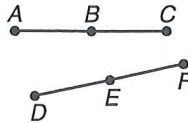
Complete the following proof.

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  $\cong$  segments

c.  $AB = BC$

c. Definition of Midpoint

$DE = EF$

d.  $AC = AB + BC$

d. Segment Addition Postulate

$DF = DE + EF$

e.  $AB + BC = DE + EF$

e. Substitution Property

f.  $AB + BC = AB + EF$

f. Substitution Property

g.  $AB + BC - AB = AB + EF - AB$

g. Subtraction Property

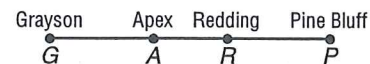
h.  $BC = EF$

h. Substitution Property

i.  $\overline{BC} \cong \overline{EF}$

i. Definition of  $\cong$  segments

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.



Given:  $\overline{GA} \cong \overline{RP}$

Prove:  $\overline{GR} \cong \overline{AP}$

Statements

Reasons

1.  $\overline{GA} \cong \overline{RP}$

1. Given

2.  $GA = RP$

2. Definition of  $\cong$  segments

3.  $GA + AR = AR + RP$

3. Addition Property

4.  $GR = GA + AR, AP = AR + RP$

4. Segment Addition Postulate

5.  $GR = AP$

5. Substitution Property

6.  $\overline{GR} \cong \overline{AP}$

6. Definition of  $\cong$  segments