

2 - 7

**Proving Segment
Relationships**



Ruler Postulate

The points on any line or line segment can be paired with real numbers so that, given any two points A and B on a line, A corresponds to zero and B corresponds to a positive real number.

Check out these 3 points:



What do we know?

collinear

$$AB + BC = AC$$

B is between A and C

What if we move B?



nothing changes



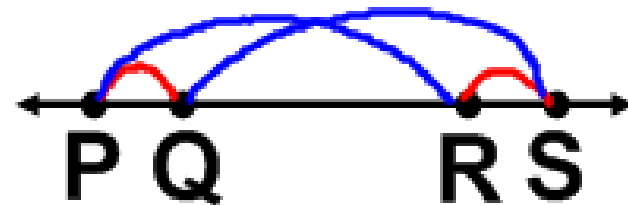
Postulate 2.9

If B is between A and C, then $AB + BC = AC$. If $AB + BC = AC$, then B is between A and C.

Prove the Segment Addition Postulate.

Given: $PQ = RS$

Prove: $PR = QS$



Statements	Reasons
1. $PQ = RS$	1. Given
2. $PQ + QR = RS + QR$	2. Addition
3. $PQ + QR = PR$ $QR + RS = QS$	3. Seg. Add. Post.
4. $PR = QS$	4. Substitution

R: $\overline{AB} \cong \overline{AB}$

S: If $\overline{AB} \cong \overline{CD}$, then $\overline{CD} \cong \overline{AB}$.

T: If $\overline{AB} \cong \overline{CD}$ and $\overline{CD} \cong \overline{EF}$, then
 $\overline{AB} \cong \overline{EF}$.

Prove Symmetric....

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

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

Statements	Reasons
1. $\overline{AB} \cong \overline{CD}$	1. Given
2. $AB = CD$	2. defn. of \cong
3. $CD = AB$	3. symmetric
4. $\overline{CD} \cong \overline{AB}$	4. defn. of \cong

Prove Reflexive....

Given: \overline{AB}

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

Statements	Reasons
1. \overline{AB}	1. Given
2. AB	2. Ruler Post.
3. $AB = AB$	3. reflexive
4. $\overline{AB} \cong \overline{AB}$	4. defn. of \cong

Prove Transitive....

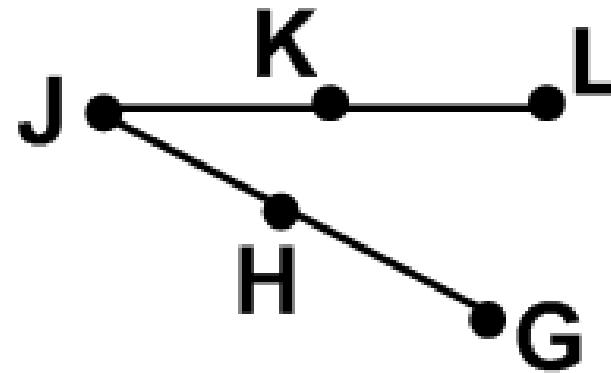
Given: $\overline{AB} \cong \overline{CD}$, $\overline{CD} \cong \overline{EF}$

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

Statements	Reasons
1. $\overline{AB} \cong \overline{CD}$	1. Given
2. $\overline{CD} \cong \overline{EF}$	2. defn. of \cong
3. $AB = CD$ $CD = EF$ $AB = EF$	3. transitive
4. $\overline{AB} \cong \overline{EF}$	4. defn. of \cong

Given: $\overline{JK} \cong \overline{KL}$, $\overline{HJ} \cong \overline{GH}$, $\overline{KL} \cong \overline{HJ}$

Prove: $\overline{GH} \cong \overline{JK}$



Statements	Reasons
1. $\overline{JK} \cong \overline{KL}, \overline{KL} \cong \overline{HJ}$	1. Given
2. $\overline{JK} \cong \overline{HJ}$	2. transitive
3. $\overline{HJ} \cong \overline{GH}$	3. Given
4. $\overline{JK} \cong \overline{GH}$	4. transitive
5. $\overline{GH} \cong \overline{JK}$	5. symmetric



Homework:

p.103 #7-9