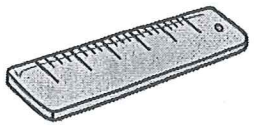
Name: Key

2-7 Proving Segment Relationships Notes

Objectives:

- Students will write proofs involving segment addition and segment congruence

Postulate 2.8: Two 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.

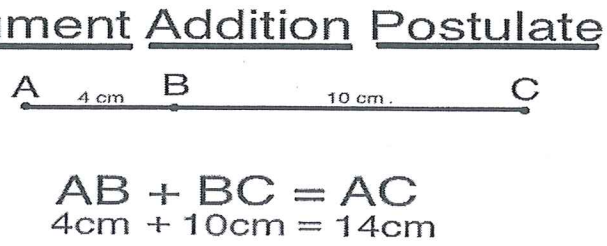


(You can use a ruler to measure the distance from point A to point B)

Postulate 2.9: Segment Addition Postulate

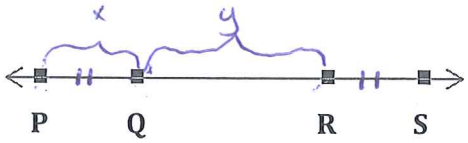
If B is between A and C, then $AB + BC = AC$

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



Example 1: Proof with Segment addition.

Prove the following:



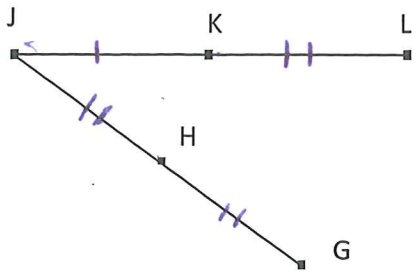
Given: PQ = RS

Prove: PR = QS

Statements	Reasons
1. PQ = RS	1. Given
2. $PQ + QR = QR + RS$	2. Addition Property
3. PQ + QR = PR QR + RS = QS	3. Segment Addition Postulate
4. $PR = QS$	4. Substitution Property

Theorem 2.2	Segment Congruence
Reflexive Property	$\overline{AB} \cong \overline{AB}$
Symmetric Property	If $\overline{AB} \cong \overline{CD}$, $\overline{CD} \cong \overline{AB}$
Transitive Property	If $\overline{AB} \cong \overline{CD}$ and $\overline{CD} \cong \overline{EF}$, then $\overline{AB} \cong \overline{EF}$

Example 2: Proof with Segment Congruence



Prove the following:

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 Property
3. ~~$\overline{HJ} \cong \overline{GH}$~~	3. Given
4. $\overline{JK} \cong \overline{GH}$	4. Transitive
5. $\overline{GH} \cong \overline{JK}$	5. Symmetric Property

Example 3

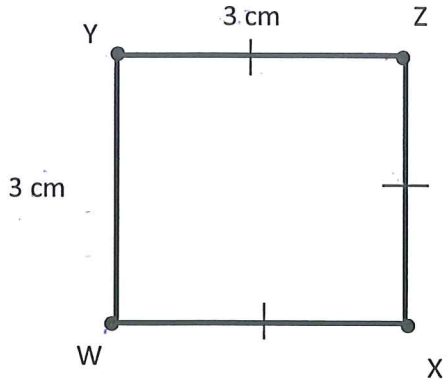
Prove the following:

Given: $WY = YZ$

$\overline{YZ} \cong \overline{XZ}$

$\overline{XZ} \cong \overline{WX}$ } Given

Prove: $\overline{WX} \cong \overline{WY}$



Statements	Reasons
1. $WY = YZ$	1. Given
2. $\overline{WY} \cong \overline{YZ}$	2. Definition of $\cong$ segments
3. $\overline{YZ} \cong \overline{XZ}$ $\quad \overline{XZ} \cong \overline{WX}$	3. Given
4. $\overline{WY} \cong \overline{WX}$	4. Transitive Property
5. $\overline{WX} \cong \overline{WY}$	5. Symmetric Property