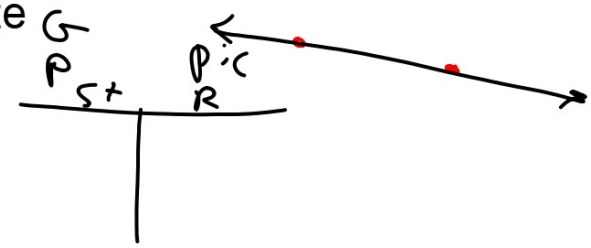
Quiz 2.5-2.6 Mon.

Geometry 2.7
Write proofs involving segment addition
Write proofs involving segment congruence

postulate
ruler postulate
segment addition postulate
2-column proof

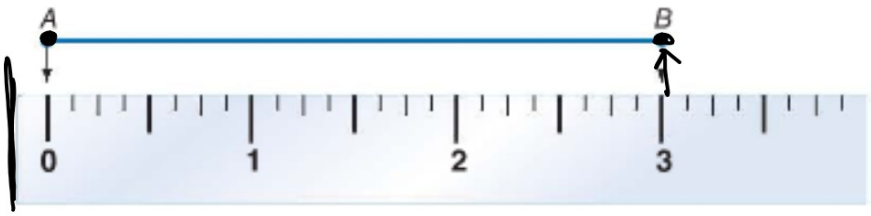
activity: scrambled proofs



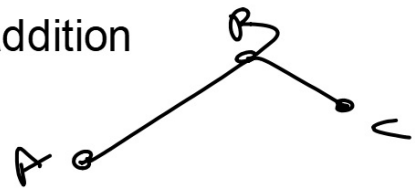
Postulate 2.8 Ruler Postulate

Words The points on any line or line segment can be put into one-to-one correspondence with real numbers.

Symbols Given any two points A and B on a line, if A corresponds to zero, then B corresponds to a positive real number.



Segment addition

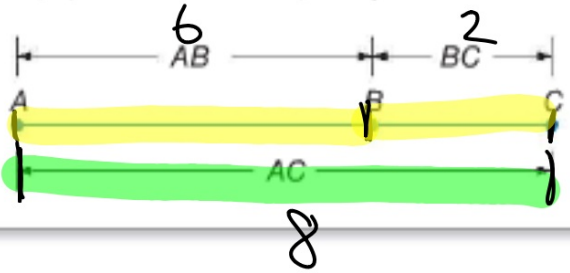


Collinear & also
The lengths have to add up!

Postulate 2.9 Segment Addition Postulate

Words If A, B, and C are collinear, then point B is between A and C if and only if $AB + BC = AC$.

Symbols



Addition property add same to both

$$\begin{array}{r} 5=5 \\ +2 \quad +2 \\ \hline 7=7 \end{array} \qquad \begin{array}{r} 3=3 \\ -1 \quad -1 \\ \hline 2=2 \end{array}$$

Proof:
Required elements:
Given
Prove
Picture
Chain of reasoning

add the same amount to both sides (addition property)
part + part = whole thing (segment addition)
Hint: before you can substitute, you need something to substitute *with...*

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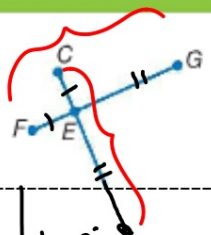
Example 1 Use the Segment Addition Postulate

Prove that if $\overline{CE} \cong \overline{FE}$ and $\overline{ED} \cong \overline{EG}$ then $\overline{CD} \cong \overline{FG}$.

Given: $\overline{CE} \cong \overline{FE}$; $\overline{ED} \cong \overline{EG}$

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



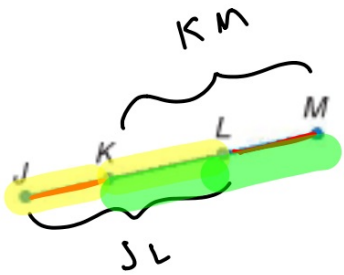
1. $\overline{CE} \cong \overline{FE}$ $\overline{ED} \cong \overline{EG}$ $CE = FE$ $ED = EG$	1. given def $\cong$
2. $CE = FE$ $ED = EG$ $CE + ED = FE + EG$	2. add
3. $CE + ED = CD$ $FE + EG = FG$	3. Seg. add
4. $CD = FG$	4. Subs.
5. $\overline{CD} \cong \overline{FG}$	5. def $\cong$

GuidedPractice

Copy and complete the proof.

1. **Given:** $\overline{JL} \cong \overline{KM}$

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



Proof:

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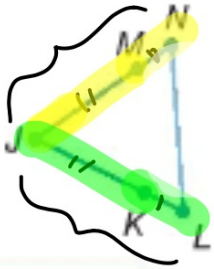
Statements	Reasons
a. $\overline{JL} \cong \overline{KM}$	a. Given
b. $JL = KM$	b. def $\cong$
c. $JK + KL = JL$; $KL + LM = KM$	c. Segment Addition Postulate
d. $JK + KL = KL + LM$	d. subs
e. $JK + KL - KL = KL + LM - KL$	e. Subtraction Property of Equality
f. $JK = LM$	f. Substitution
g. $\overline{JK} \cong \overline{LM}$	g. Definition of congruence

Theorem 2.2 Properties of Segment Congruence

Reflexive Property of Congruence	$\overline{AB} \cong \overline{AB}$
Symmetric Property of Congruence	If $\overline{AB} \cong \overline{CD}$, then $\overline{CD} \cong \overline{AB}$.
Transitive Property of Congruence	If $\overline{AB} \cong \overline{CD}$ and $\overline{CD} \cong \overline{EF}$, then $\overline{AB} \cong \overline{EF}$.

1. CCSS **ARGUMENTS** Copy and complete the proof.



Given: $\overline{LK} \cong \overline{NM}$, $\overline{KJ} \cong \overline{MJ}$

Prove: $\overline{LJ} \cong \overline{NJ}$

Proof:

Statements	Reasons
a. $\overline{LK} \cong \overline{NM}$, $\overline{KJ} \cong \overline{MJ}$	a. given
b. $LK = NM$ $KJ = MJ$	b. Def. of congruent segments
c. $LK + KJ = NM + MJ$	c. add prop
d. $JM + MN = JN$ $JK + KL = JL$	d. Segment Addition Postulate
e. $LJ = NJ$	e. Subs
f. $\overline{LJ} \cong \overline{NJ}$	f. def $\cong$