

Quiz 2.5-2.6 Fri.

Geometry 2.7

G/P/P

Write proofs involving segment addition

Write proofs involving segment congruence

postulate

Given
Prove

Drawing

* 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.



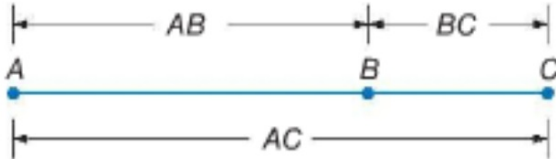
Segment addition

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

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

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...*

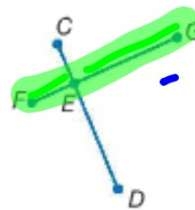
Example 1 Use the Segment Addition Postulate

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

Proof:



Statements

1. $\overline{CE} \cong \overline{FE}$, $\overline{ED} \cong \overline{EG}$
2. $CE = FE$; $ED = EG$
3. $CE + ED = CD$
4. $FE + EG = CD$
5. $FE + EG = FG$
6. $CD = FG$
7. $\overline{CD} \cong \overline{FG}$

Reasons

1. Given
2. Definition of congruence
3. Segment Addition Postulate
4. Substitution (Steps 2 & 3)
5. Segment Addition Postulate
6. Substitution (Steps 4 & 5)
7. Definition of congruence

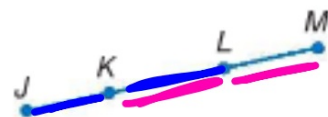
Guided Practice

Copy and complete the proof.

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

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

Proof:



Statements

a. $\overline{JL} \cong \overline{KM}$

b. $\overline{JL} = \overline{KM}$

c. $JK + KL = \underline{JL}$; $KL + LM = \underline{KM}$

d. $JK + KL = KL + LM$

e. $JK + \cancel{KL} - \cancel{KL} = \cancel{KL} + LM - \cancel{KL}$

f. $\underline{JK \cong LM}$

g. $\overline{JK} \cong \overline{LM}$

Reasons

a. Given

b. def. $\cong$

c. Segment Addition Postulate

d. Subs.

e. Subtraction Property of Equality

f. Substitution

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 $\overline{AB} \cong \overline{EF}$.

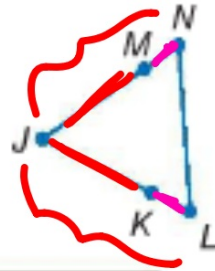
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1. **CCSS ARGUMENTS** Copy and complete the proof.

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. <u>given</u>
b. $LK = NM$, $KJ = MJ$	b. Def. of congruent segments
c. $LK + KJ = NM + MJ$	c. <u>add</u>
d. $LJ = NJ$	d. Segment Addition Postulate
e. $\overline{LJ} \cong \overline{NJ}$	e. <u>subs</u>
f. $\overline{LJ} \cong \overline{NJ}$	f. <u>def</u>

2.7

4, 5, 9-13 odd

14, 15, 27