Module 3 Proofs

Sunday, November 15, 2026 8:00 PM

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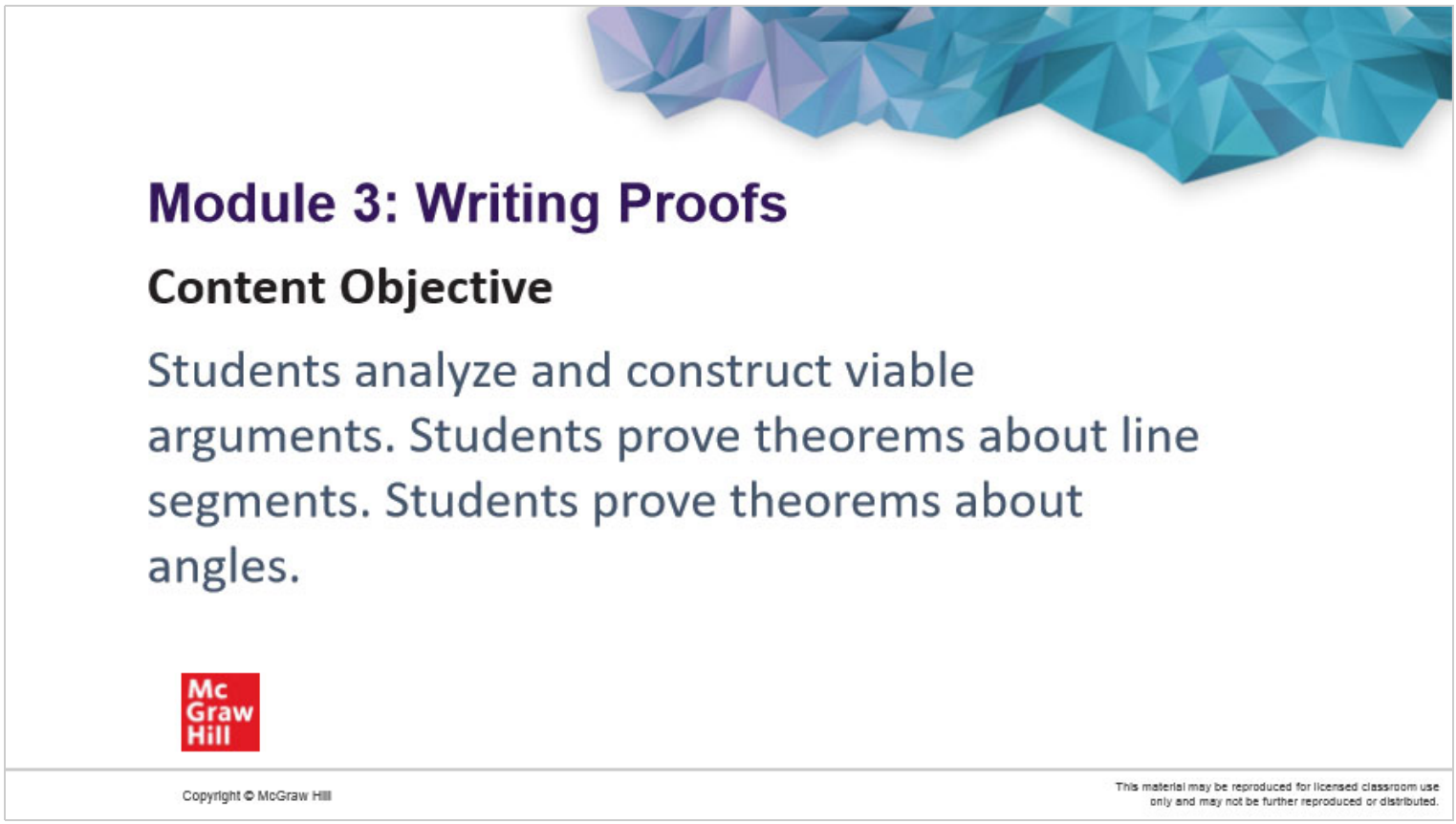
Module 3 Proofs



Florida's B.E.S.T. Standards for Mathematics

MA.912.GR.1.1

Prove relationships and theorems about lines and angles. Solve mathematical and real-world problems involving postulates, relationships and theorems of lines and angles.

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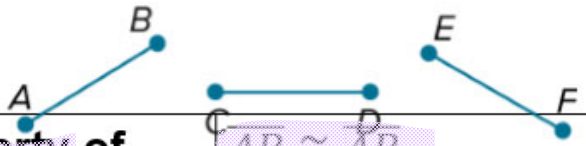
Learn

Segment Addition

Theorem 3.2: Properties of Segment Congruence	
	
Reflexive Property of Congruence Reflection	$\overline{AB} \cong \overline{AB}$ Same
Symmetric Property of Congruence Symmetry	If $\overline{AB} \cong \overline{CD}$, then $\overline{CD} \cong \overline{AB}$. flips
Transitive Property of Congruence	If $\overline{AB} \cong \overline{CD}$, and $\overline{CD} \cong \overline{EF}$, then $\overline{AB} \cong \overline{EF}$. CD = EF

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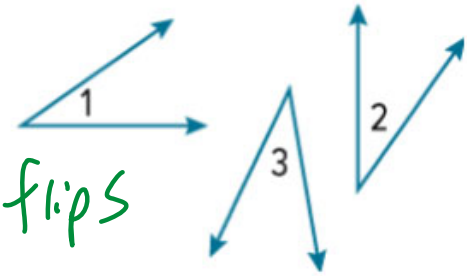
Learn
Congruent Angles

Theorem 3.5: Properties of Angle Congruence	
Reflexive Property of Congruence $\angle 1 \cong \angle 1$ Reflection Same	
Symmetric Property of Congruence If $\angle 1 \cong \angle 2$, then $\angle 2 \cong \angle 1$. Symmetry flips	
Transitive Property of Congruence If $\angle 1 \cong \angle 2$ and $\angle 2 \cong \angle 3$, then $\angle 1 \cong \angle 3$. $2 = 3$	

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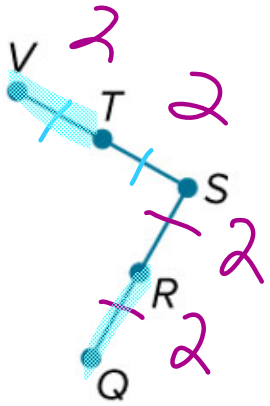
Example 2
Prove Segment Congruence

Write a two-column proof.



Given: R is the midpoint of $\overline{QS}$.
T is the midpoint of $\overline{VS}$.
$\overline{QR} \cong \overline{VT}$

Prove: $\overline{RS} \cong \overline{TS}$
$2 = 2$

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Example 2
Prove Segment Congruence

Proof:

Statements	Reasons
1. R is the midpoint of $\overline{QS}$. T is the midpoint of $\overline{VS}$.	1. Given
2. $\overline{QR} \cong \overline{RS}$, $\overline{VT} \cong \overline{TS}$	2. Definition of Midpoint
3. $QR = VT$	3. Given
4. $\overline{QR} \cong \overline{TS}$	4. Transitive Prop.
5. $RS = QR$	5. Symmetric Property of Congruence
6. $RS = TS$	6. Transitive Property of Congruence

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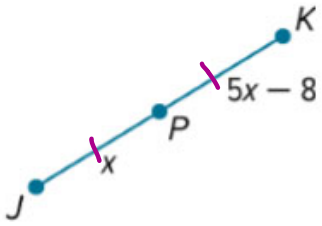
Example 4
Flow Proofs

Write a flow proof to prove that $x = 2$.

Given: P is the midpoint of $\overline{JK}$.
Prove: $x = 2$



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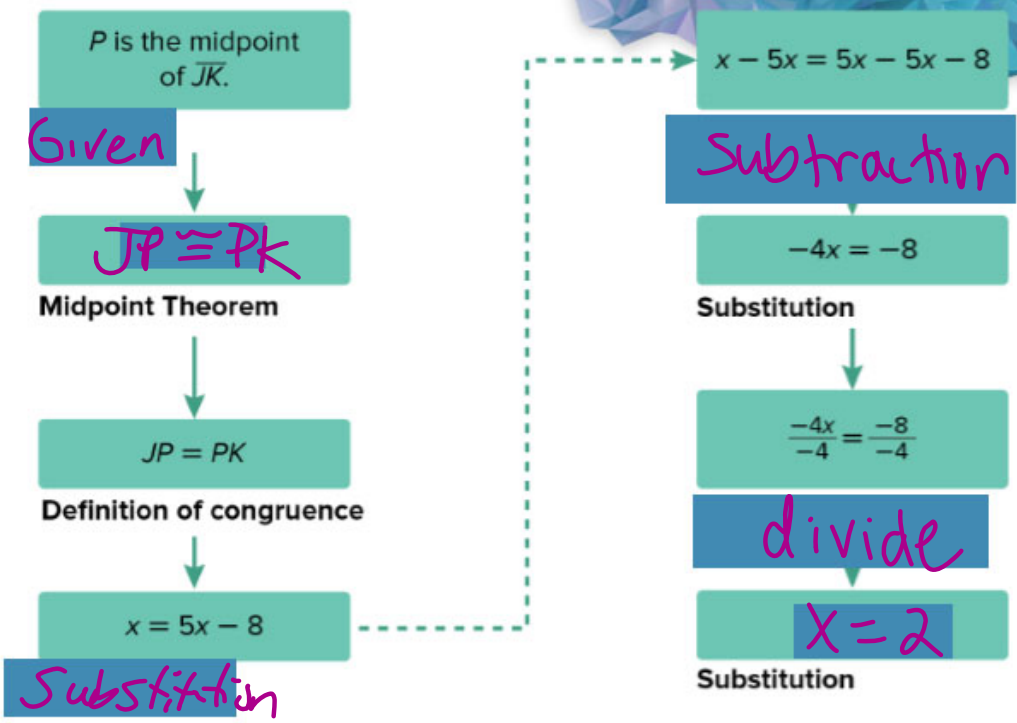
Example 4
Flow Proofs

Proof:



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Example 4
Flow Proofs

Check

Write each statement and reason in the correct box to complete the flow proof.

Given: $FG = HK$
Prove: $x = 7$



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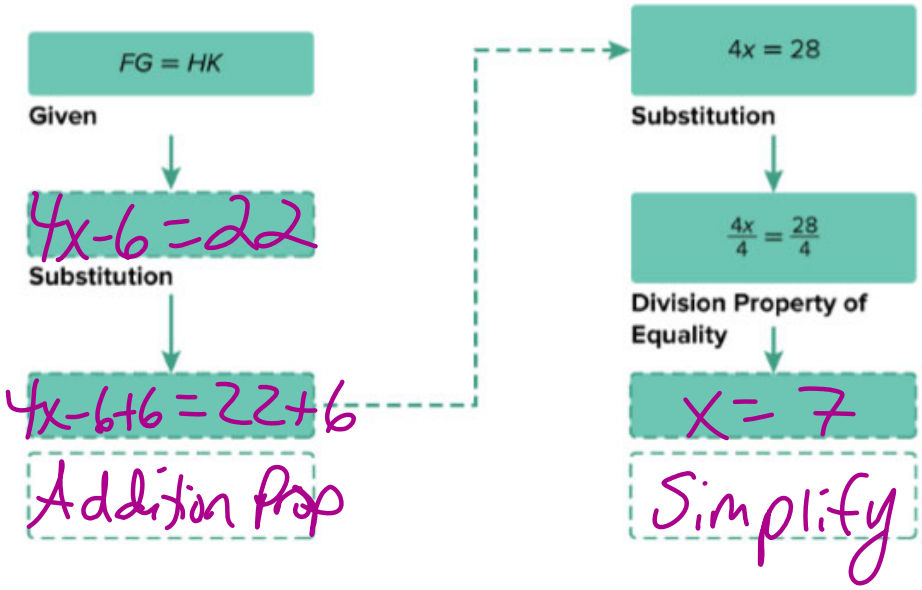
Example 4
Flow Proofs

Proof:



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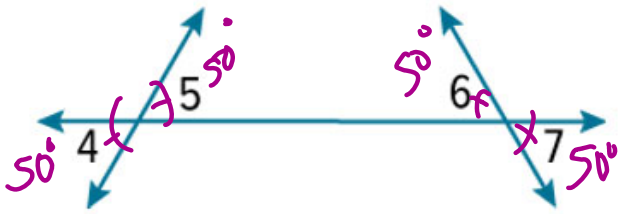
Example 4
Vertical Angles

Check

Complete the proof.

Given: ∠4 ≅ ∠7

Prove: ∠5 ≅ ∠6



Statements	Reasons
1. ∠4 ≅ ∠7	1. Given
2. ∠5 ≅ ∠4 and ∠7 ≅ ∠6	2. vertical angles ≅
3. ∠5 ≅ ∠7	3. transitive
4. ∠5 ≅ ∠6	4. transitive

5 = 7

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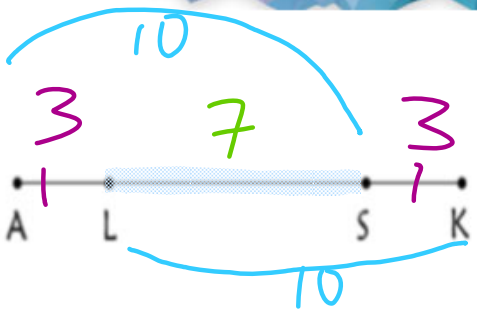
Prove the following by writing a paragraph proof.

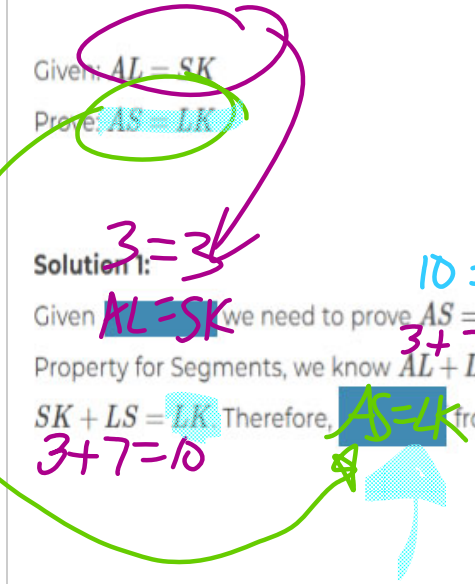
Given: $AL = SK$

Prove: $AS = LK$



Solution 1:

Given $AL = SK$, we need to prove $AS = LK$. We know from the diagram that $LS = LS$ by the Reflexive Property. Using the Addition Property for Segments, we know $AL + LS = SK + LS$. From the Segment Addition Postulate, we know that $AL + LS = AS$ and $SK + LS = LK$. Therefore, $AS = LK$ from the Substitution Property.



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