Student Name: _____ Date: _____

Module 3 Proofs Homework

1) **PROOF** Point *Y* is the midpoint of $\overline{XZ}$. Point *W* is collinear with *X*, *Y*, and *Z*. *Z* is the midpoint of $\overline{YW}$. Complete the two-column proof to prove that $\overline{XY} \cong \overline{ZW}$. Drag the statements and reasons to complete the proof.

Statements	Reasons
1. *Y* is the midpoint of $\overline{XZ}$. *W* is collinear with *X*, *Y*, and *Z*. *Z* is the midpoint of $\overline{YW}$.	**1.**
2.	**2.** Midpoint Thm.
3.	**3.** Def. of ≅ segments
4.	**4.** Transitive Prop. of Equality
5. $\overline{XY} \cong \overline{ZW}$	**5.**

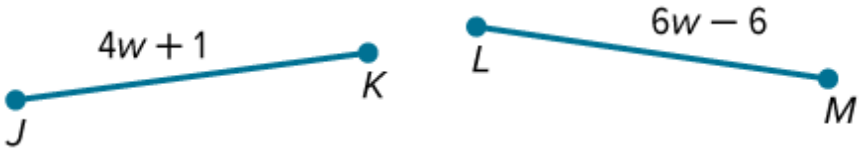
- $\overline{XY} \cong \overline{YZ}$ and $\overline{YZ} \cong \overline{ZW}$
- $XY = ZW$
- **Given**
- **Def. of ≅ segs.**
- $XY = YZ$ and $YZ = ZW$

Student Name: _____ Date: _____

Module 3 Proofs Homework

2) PROOF Complete the two-column proof to prove that $w = 3.5$. The statements are provided on the left. Drag the reasons to the corresponding statements.

Given: $\overline{JK} \cong \overline{LM}$
Prove: $w = 3.5$



Proof:

1. $\overline{JK} \cong \overline{LM}$ _____

2. $JK = LM$ _____

3. $4w + 1 = 6w - 6$ _____

4. $4w + 7 = 6w$ _____

5. $7 = 2w$ _____

6. $3.5 = w$ _____

7. $w = 3.5$ _____

Substitution Property of Equality
Subtraction Property of Equality
Definition of congruent segments
Symmetric Property of Equality
Addition Property of Equality
Given
Division Property of Equality

Student Name: _____ Date: _____

Module 3 Proofs Homework

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3) **PROOF** Point *L* is the midpoint of $\overline{JK}$. $\overline{JK}$ intersects $\overline{MK}$ at *K*. If $\overline{MK} \cong \overline{JL}$, complete the flow proof to prove that $\overline{LK} \cong \overline{MK}$. Drag the statements and reasons to complete the proof.

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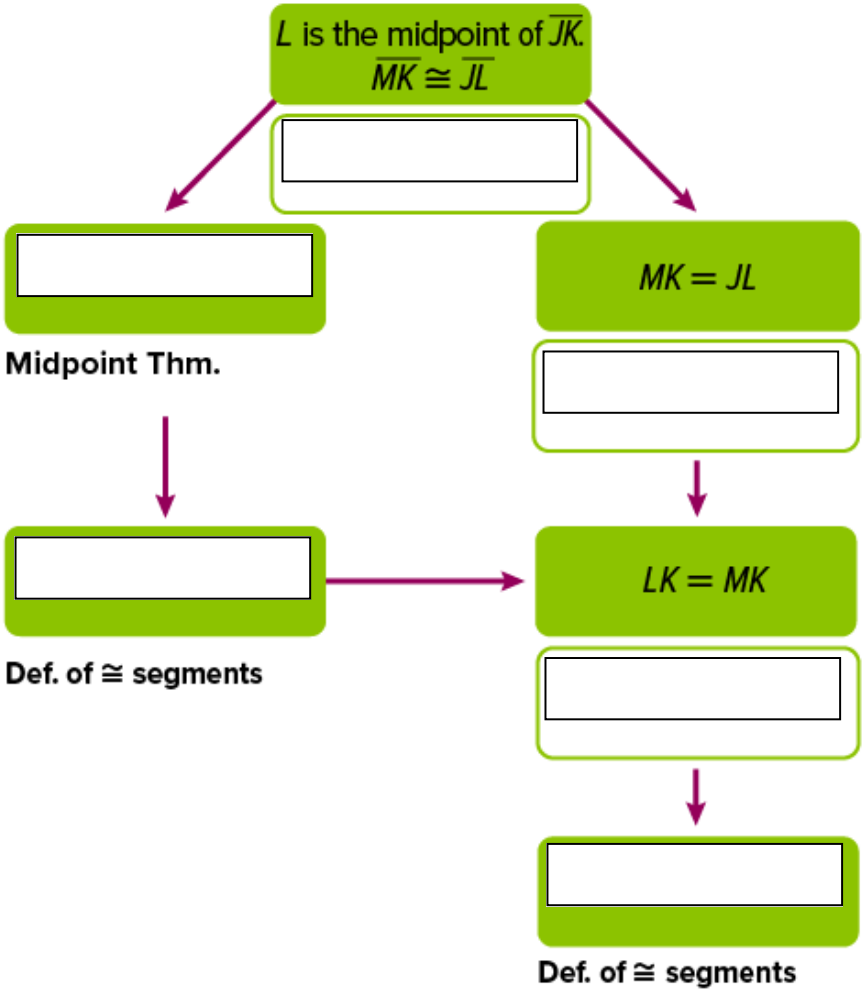
Module 3 Proofs Homework



- **Given**
- $JL = LK$
- **Transitive Prop. of =**

Module 3 Proofs Homework

- $\overline{LK} \cong \overline{MK}$
- $\overline{JL} \cong \overline{LK}$
- **Def. of ≅ segments**

4) Fill in the blanks using the available answer choices.

PROOF In the figure, point *B* is the midpoint of $\overline{AC}$ and point *C* is the midpoint of $\overline{BD}$.

Complete the paragraph proof to prove that $AB = CD$.

Given: *B* is the midpoint of $\overline{AC}$. *C* is the midpoint of $\overline{BD}$.

Prove: $AB = CD$

Proof: Because *B* is the midpoint of $\overline{AC}$ and _____ (Blank 1) is the midpoint of $\overline{BD}$, we know by the _____ (Blank 2) that $\overline{AB} \cong \overline{BC}$ and $\overline{BC} \cong \overline{CD}$. Because congruent segments have _____ (Blank 3) measures, $AB = BC$ and _____ (Blank 4). Thus, by the _____ (Blank 5), $AB = CD$.

Blank 1 options
- C
- D

Blank 2 options
- Bisector Theorem
- Midpoint Theorem
- definition of congruent segments

Blank 3 options
- different
- equal

Blank 4 options
- AC = CD
- BC = CD
- CD = BD

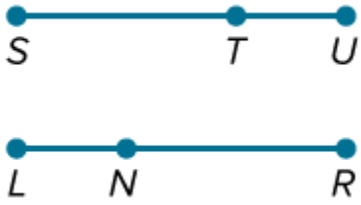
Blank 5 options
- Reflexive Property of Equality
- Transitive Property of Equality
- Symmetric Property of Equality

Student Name: _____ Date: _____

Module 3 Proofs Homework

5) PROOF Complete the two-column proof. The statements are provided on the left. Drag the reasons to the corresponding statements.

Given: $\overline{SU} \cong \overline{LR}$
$\overline{TU} \cong \overline{LN}$
Prove: $\overline{ST} \cong \overline{NR}$



Proof:

1. $\overline{SU} \cong \overline{LR}$, $\overline{TU} \cong \overline{LN}$	_____
2. $SU = LR$, $TU = LN$	_____
3. $SU = ST + TU$ $LR = LN + NR$	_____
4. $ST + TU = LN + NR$	_____
5. $ST + LN = LN + NR$	_____
6. $ST + LN - LN = LN + NR - LN$	_____
7. $ST = NR$	_____
8. $\overline{ST} \cong \overline{NR}$	_____

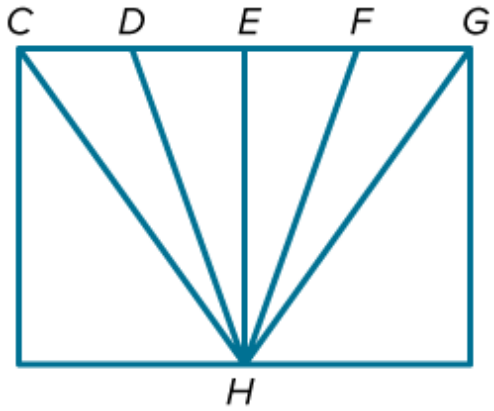
Substitution Property (3rd use)
Substitution Property (2nd use)
Segment Addition Postulate
Given
Substitution Property (1st use)
Definition of ≅ segments (2nd use)
Definition of ≅ segments (1st use)
Subtraction Property

Student Name: _____ Date: _____

Module 3 Proofs Homework

6) PROOF Complete the two-column proof to prove the given geometric relationship. Drag the missing statements and reasons into the correct order.

Given: E is the midpoint of $\overline{DF}$ and $\overline{CD} \cong \overline{FG}$.
Prove: $\overline{CE} \cong \overline{EG}$



Proof:

Statements	Reasons
1. ?	**1.** Given
2. $DE = EF$	**2.** ?
3. $CD = FG$	**3.** ?
4. $CD + DE = EF + FG$	**4.** ?
5. ?	**5.** Segment Addition Postulate
6. ?	**6.** Substitution Property
7. $\overline{CE} \cong \overline{EG}$	**7.** ?

1) _____
2) _____
3) _____
4) _____
5) _____
6) _____
7) _____

Definition of midpoint

Addition Property of Equality

$CE = CD + DE$ and $EG = EF + FG$

$CE = EG$

Module 3 Proofs Homework

E is the midpoint of $\overline{DF}$ and $\overline{CD} \cong \overline{FG}$.

Definition of ≅ segments (1st use)

Definition of ≅ segments (2nd use)

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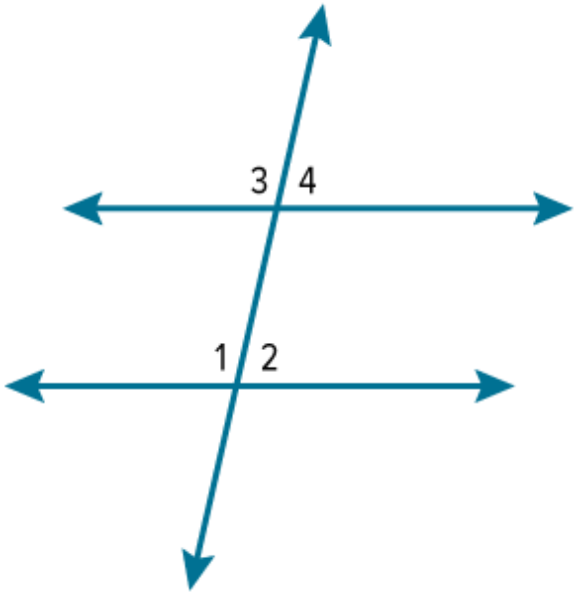
Module 3 Proofs Homework

7) PROOF Complete the two-column proof by dragging the statements and reasons.

Given: $\angle 1 \cong \angle 3$
Prove: $\angle 2 \cong \angle 4$



Proof:

Student Name: _____ Date: _____

Module 3 Proofs Homework

Statements	Reasons
1. $\angle 1$ and $\angle 2$ form a linear pair. $\angle 3$ and $\angle 4$ form a linear pair.	**1.**
2.	**2.** Supplement Thm.
3. $\angle 1 \cong \angle 3$	**3.**
4.	**4.**

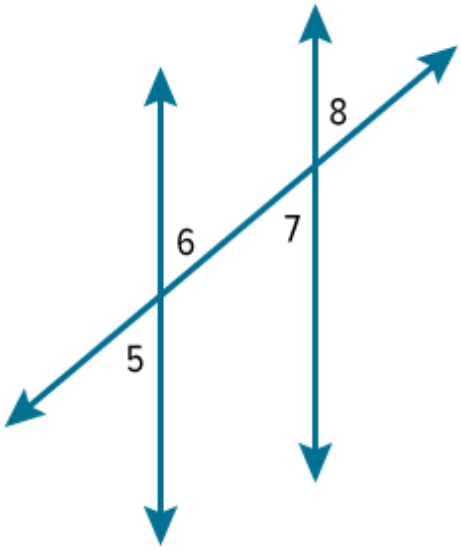
- **≅ Supp. Thm**

Module 3 Proofs Homework

- **∠1 and ∠2 are supp.**
  ∠3 and ∠4 are supp.
- $\angle 2 \cong \angle 4$
- **Def. of linear pair**
- **Given**

8) PROOF Complete the two-column proof. The statements are provided on the left. Drag the reasons to the corresponding statements.

Given: $\angle 5 \cong \angle 7$
Prove: $\angle 5 \cong \angle 8$



Proof:

1. $\angle 5 \cong \angle 7$ _____

2. $\angle 7 \cong \angle 8$ _____

3. $\angle 5 \cong \angle 8$ _____

Vertical Angles Theorem

Transitive Prop. of Congruence

Supplements Theorem

Given

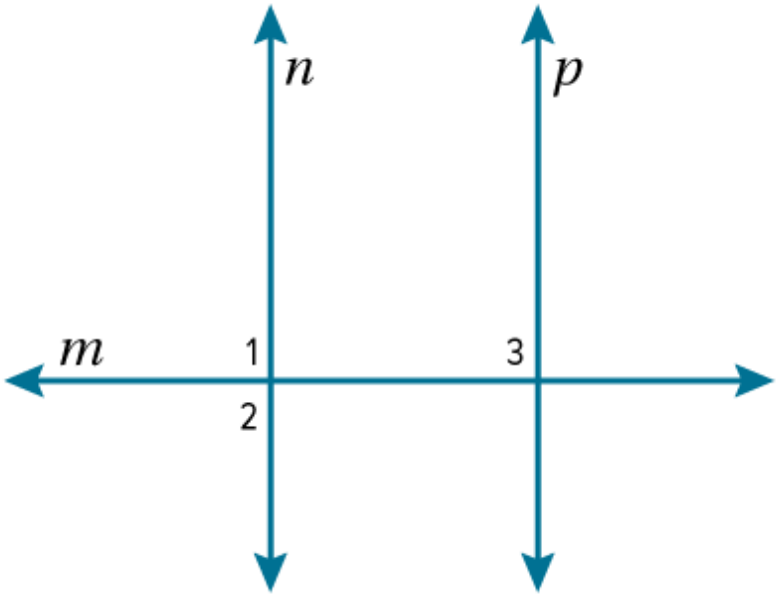
≅ Supplements Theorem

Student Name: _____ Date: _____

Module 3 Proofs Homework

9) PROOF Complete the two-column proof by dragging the statements and reasons.

Given: $\angle 1 \cong \angle 2;\ m \perp p$
Prove: $\angle 2 \cong \angle 3$



Proof:

Student Name: _____ Date: _____

Module 3 Proofs Homework

Statements	Reasons
1. $\angle 1 \cong \angle 2; m \perp p$	**1.**
2.	**2.** Def. of linear pair
3.	**3.** If $2 \cong \angle$s form a linear pair, they are right $\angle$s.
4. $\angle 3$ is a right angle.	**4.**
5.	**5.** All right $\angle$s are congruent.

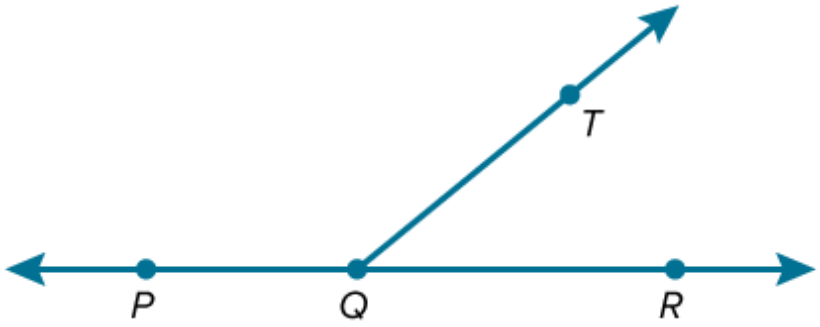
- **$\angle 1$ and $\angle 2$ are rt. $\angle$s.**
- **$\perp$ lines form 4 rt. $\angle$s.**
- **Given**
- $\angle 2 \cong \angle 3$
- **$\angle 1$ and $\angle 2$ form a linear pair.**

Student Name: _____ Date: _____

Module 3 Proofs Homework

10) PROOF Complete the two-column proof for the given theorem by dragging the missing statements and reasons into the correct order.

Supplement Theorem
Given: $\angle PQT$ and $\angle TQR$ form a linear pair.
Prove: $\angle PQT$ and $\angle TQR$ are supplementary.



Proof:

Statements	Reasons
1. $\angle PQT$ and $\angle TQR$ form a linear pair.	**1.** ?
2. ?	**2.** Given from figure
3. ?	**3.** Def. of straight angle
4. $m\angle PQT + m\angle TQR = m\angle PQR$	**4.** ?
5. ?	**5.** Substitution
6. $\angle PQT$ and $\angle TQR$ are supplementary.	**6.** ?

1) _____
2) _____
3) _____
4) _____
5) _____
6) _____

$m\angle PQT + m\angle TQR = 180°$

$\angle PQR$ is a straight angle.

Angle Add. Post.

Def. of supp. angles

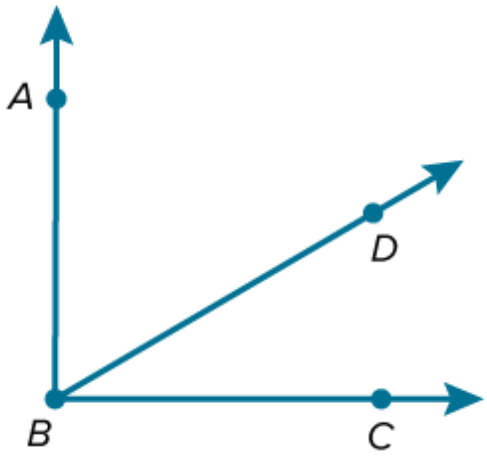
Module 3 Proofs Homework

Given

$m\angle PQR = 180°$

11) PROOF Complete the two-column proof for the given theorem by dragging the missing statements and reasons into the correct order.

Complement Theorem
Given: $\angle ABC$ is a right angle.
Prove: $\angle ABD$ and $\angle CBD$ are complementary.



Proof:

Statements	Reasons
1. ?	**1.** Given
2. $m\angle ABC = 90°$	**2.** ?
3. ?	**3.** Angle Add. Post.
4. ?	**4.** Substitution
5. $\angle ABD$ and $\angle CBD$ are complementary.	**5.** ?

1) _____

2) _____

3) _____

4) _____

5) _____

$m\angle ABC = m\angle ABD + m\angle CBD$

$\angle ABC$ is a right angle.

Def. of comp. angles

$m\angle ABD + m\angle CBD = 90°$

Def. of rt. angle