Name_KEY_ Date_____

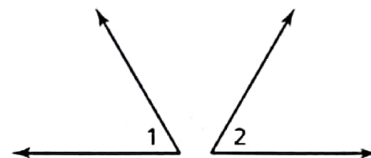## 2.5 Notetaking with Vocabulary (continued)

Core Concepts

Writing a Two-Column Proof

In a proof, you make one statement at a time until you reach the conclusion. Because you make statements based on facts, you are using deductive reasoning. Usually the first statement-and-reason pair you write is given information.

Copy or draw diagrams and label given information to help develop proofs. Do not mark or label the information in the Prove statement on the diagram.

Proof of the Symmetric Property of Angle Congruence

Given $\angle 1 \cong \angle 2$ **Prove** $\angle 2 \cong \angle 1$

statements based on facts that you know or on conclusions from deductive reasoning

STATEMENTS	REASONS
1. $\angle 1 \cong \angle 2$	1. Given
2. $m\angle 1 = m\angle 2$	2. Definition of congruent angles
3. $m\angle 2 = m\angle 1$	3. Symmetric Property of Equality
4. $\angle 2 \cong \angle 1$	4. Definition of congruent angles

definitions, postulates, or proven theorems that allow you to state the corresponding statement

The number of statements will vary.

Remember to give a reason for the last statement.

Notes:

Extra Practice

**In Exercises 1 and 2, complete the proof.**

1. **Given** $\overline{AB}$ and $\overline{CD}$ bisect each other at point M and $\overline{BM} \cong \overline{CM}$.
   Prove $AB = AM + DM$
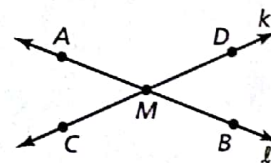
STATEMENTS	REASONS
1. $\overline{BM} \cong \overline{CM}$	1. Given
2. $\overline{CM} \cong \overline{DM}$	2. Definition of Segment Bisector
3. $\overline{BM} \cong \overline{DM}$	3. Transitive Property of Equality
4. $BM = DM$	4. Congruent Segments have Equal lengths (SCP)
5. $AB = AM + BM$	5. Segment Addition Postulate (Post. 1.2)
6. $AB = AM + DM$	6. Substitution (from #4 + #5)

2.5 Notetaking with Vocabulary (continued)

2. **Given** $\angle AEB$ is a complement of $\angle BEC$.
   **Prove** $m\angle AED = 90°$
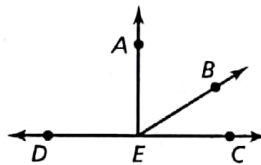
STATEMENTS	REASONS
1. $\angle AEB$ is a complement of $\angle BEC$.	1. Given
2. $m\angle AEB + m\angle BEC = 90°$	2. Definition of complementary angles
3. $m\angle AEC = m\angle AEB + m\angle BEC$	3. Angle Addition Postulate
4. $m\angle AEC = 90°$	4. Substitution (from #2 + #3)
5. $m\angle AED + m\angle AEC = 180°$	5. Definition of supplementary angles (Why are these supplementary?)
6. $m\angle AED + 90° = 180°$	6. Substitution Property of Equality (from #4 + #5)
7. $m\angle AED = 90°$	7. Subtraction Property of Equality

In Exercises 3 and 4, name the property that the statement illustrates.

3. If $\angle RST \cong \angle TSU$ and $\angle TSU \cong \angle VWX$, then $\angle RST \cong \angle VWX$.

   Transitive Property of Equality

4. If $\overline{GH} \cong \overline{JK}$, then $\overline{JK} \cong \overline{GH}$.

   Symmetric Property of Equality

5. Write a two-column proof.

   Given M is the midpoint of $\overline{RT}$.
   Prove $MT = RS + SM$
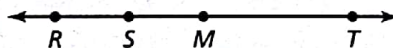
STATEMENTS	REASONS
1) M is Midpoint of $\overline{RT}$	1) Given
2) $RM = MT$	2) Definition of Midpoint
3) $RM = RS + SM$	3) Segment Addition Postulate
4) $MT = RS + SM$	4) Substitution (from #2 + #3)