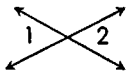
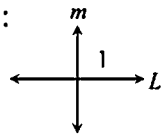
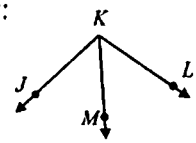
PRACTICE!

Justify each statement below using a property of equality, property of congruence, definition, postulate, or theorem.

1. If $\angle C$ is a right angle, then $m\angle C = 90°$	1. Def. of Right Angle
2. If $\angle X$ is supplementary to $\angle Y$ and $\angle X$ is supplementary to $\angle Z$, then $\angle Y \cong \angle Z$.	2. Congruent Supplements Thm
3. If  then, $\angle 1 \cong \angle 2$	3. Vertical Angles Theorem
4. If $m\angle P + m\angle Q = 90°$, then $\angle P$ and $\angle Q$ are complementary.	4. Def of Complementary <'s
5. If $\angle M$ and $\angle N$ form a right angle, then then $\angle M$ and $\angle N$ are complementary.	5. Complement Theorem
6. Given:  If $l \perp m$, then $\angle 1$ is a right angle.	6. Def. of Perpendicular
7. If $\angle W$ and $\angle X$ are supplementary, then $m\angle W + m\angle X = 180°$.	7. Def. of Supplementary <'s
8. If $\angle L$ is complementary to $\angle M$ and $\angle N$ is complementary to $\angle M$, then $\angle L \cong \angle N$.	8. Congruent Complements Thm
9. If $\angle A$ and $\angle B$ form a linear pair, then then $\angle A$ and $\angle B$ are supplementary.	9. Linear Pair Thm (Supp. Thm.)
10. If $\angle N$ and $\angle P$ are complementary, then $m\angle N + m\angle P = 90°$.	10. Def. of Complementary
11. Given the diagram to the right: $m\angle JKM + m\angle MKL = m\angle JKL$ 	11. Angle Addition Postulate
12. If $m\angle R = m\angle S$, then $\angle R \cong \angle S$.	12. Def. of Congruence

REASONS BANK

Properties of Equality:
Addition Property
Subtraction Property
Multiplication Property
Division Property
Distributive Property
Substitution Property
Reflexive Property
Symmetric Property
Transitive Property

Properties of Congruence:
Reflexive Property
Symmetric Property
Transitive Property

Definitions:
Definition of Congruence
Definition of a Right Angle
Definition of Complementary Angles
Definition of Supplementary Angles
Definition of an Angle Bisector
Definition of Perpendicular

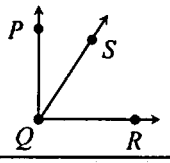
Postulates:
Angle Addition Postulate

Theorems:
Vertical Angles Theorem
Complement Theorem
Linear Pair (Supplement) Theorem
Congruent Complements Theorem
Congruent Supplements Theorem

ANGLE Proofs

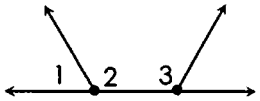
Complete the proofs below by giving the missing statements and reasons.

1 **Given:** $\angle PQR$ is a right angle
Prove: $\angle PQS$ and $\angle SQR$ are complementary



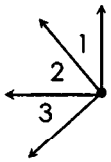
Statements	Reasons
1. $\angle PQR$ is a right angle	1. Given
2. $m\angle PQR = 90°$	2. Def. of Right Angle
3. $m\angle PQS + m\angle SQR = m\angle PQR$	3. Angle Addition Postulate
4. $m\angle PQS + m\angle SQR = 90°$	4. Transitive Property
5. $\angle PQS$ and $\angle SQR$ are complementary	5. Def. of Complementary ∠'s

2 **Given:** $\angle 2 \cong \angle 3$; $\angle 1$ and $\angle 2$ form a linear pair
Prove: $\angle 1$ and $\angle 3$ are supplementary



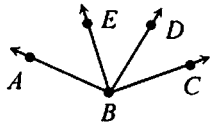
Statements	Reasons
1. $\angle 2 \cong \angle 3$	1. Given
2. $m\angle 2 = m\angle 3$	2. Def. of Congruence
3. $\angle 1$ and $\angle 2$ form a linear pair	3. Given
4. $\angle 1$ and $\angle 2$ are supplementary	4. Linear Pair Thm (Supp. Thm)
5. $m\angle 1 + m\angle 2 = 180°$	5. Def. of Supplementary ∠'s
6. $m\angle 1 + m\angle 3 = 180°$	6. Substitution Property
7. $\angle 1$ and $\angle 3$ are supplementary	7. Def. of Supplementary ∠'s

3 **Given:** $\angle 1$ and $\angle 2$ form a right angle; $m\angle 1 + m\angle 3 = 90°$
Prove: $\angle 2 \cong \angle 3$



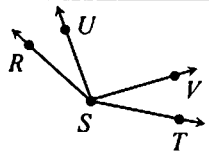
Statements	Reasons
1. $\angle 1$ and $\angle 2$ form a right angle	1. Given
2. $\angle 1$ and $\angle 2$ are complementary	2. Complement Theorem
3. $m\angle 1 + m\angle 3 = 90°$	3. Given
4. $\angle 1$ and $\angle 3$ are complementary	4. Def of Complementary ∠'s
5. $\angle 2 \cong \angle 3$	5. Congruent Complements Thm.

4 **Given:** $\overrightarrow{BE}$ bisects $\angle ABD$; $\overrightarrow{BD}$ bisects $\angle EBC$
Prove: $\angle ABE \cong \angle DBC$



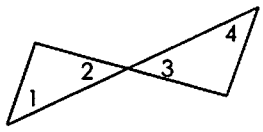
Statements	Reasons
1. $\overrightarrow{BE}$ bisects $\angle ABD$	1. Given
2. $\angle ABE \cong \angle EBD$	2. Def. of Angle Bisector
3. $\overrightarrow{BD}$ bisects $\angle EBC$	3. Given
4. $\angle EBD \cong \angle DBC$	4. Def. of Angle Bisector
5. $\angle ABE \cong \angle DBC$	5. Transitive Property

5 **Given:** $\angle RSU \cong \angle VST$
Prove: $\angle RSV \cong \angle UST$



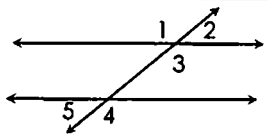
Statements	Reasons
1. $\angle RSU \cong \angle VST$	1. Given
2. $m\angle RSU = m\angle VST$	2. Def. of Congruence
3. $m\angle RSU + m\angle USV = m\angle RSV$	3. Angle Addition Postulate
4. $m\angle VST + m\angle USV = m\angle UST$	4. Angle Addition Postulate
5. $m\angle RSU + m\angle USV = m\angle UST$	5. Substitution Property
6. $m\angle RSV = m\angle UST$	6. Transitive Property
7. $\angle RSV \cong \angle UST$	7. Def. of Congruence

6 **Given:** $\angle 1$ and $\angle 2$ are complementary, $\angle 3$ and $\angle 4$ are complementary
Prove: $\angle 1 \cong \angle 4$



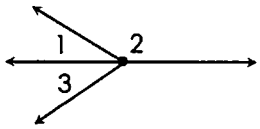
Statements	Reasons
1. $\angle 1$ and $\angle 2$ are complementary	1. Given
2. $\angle 3$ and $\angle 4$ are complementary	2. Given
3. $m\angle 1 + m\angle 2 = 90°$	3. Def. of Complementary $\angle$'s
4. $m\angle 3 + m\angle 4 = 90°$	4. Def. of Complementary $\angle$'s
5. $\angle 2 \cong \angle 3$	5. Vertical Angles Theorem
6. $m\angle 2 = m\angle 3$	6. Def. of Congruence
7. $m\angle 1 + m\angle 2 = m\angle 3 + m\angle 4$	7. Transitive Property
8. $m\angle 1 + m\angle 3 = m\angle 3 + m\angle 4$	8. Substitution Property
9. $m\angle 1 = m\angle 4$	9. Subtraction Property
10. $\angle 1 \cong \angle 4$	10. Def. of Congruence

7 **Given:** $\angle 1 \cong \angle 4$; $\angle 4$ and $\angle 5$ form a linear pair
Prove: $\angle 1$ and $\angle 5$ are supplementary



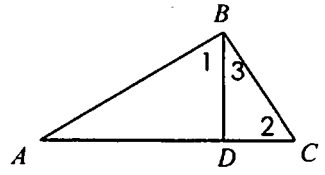
Statements	Reasons
1. $\angle 1 \cong \angle 4$	1. Given
2. $m\angle 1 = m\angle 4$	2. Definition of Congruence
3. $\angle 4$ and $\angle 5$ form a lin. pr.	3. Given
4. $\angle 4$ and $\angle 5$ are supplementary	4. Linear Pair Thm. (Supp. Thm.)
5. $m\angle 4 + m\angle 5 = 180$	5. Definition of Supplementary Angles
6. $m\angle 1 + m\angle 5 = 180$	6. Substitution
7. $\angle 1$ and $\angle 5$ are supplementary	7. Def. of Supplementary $\angle$'s

8 **Given:** $\angle 1$ and $\angle 2$ form a linear pair; $m\angle 2 + m\angle 3 = 180°$
Prove: $\angle 1 \cong \angle 3$



Statements	Reasons
1. $\angle 1$ and $\angle 2$ form a linear pair	1. Given
2. $\angle 1$ and $\angle 2$ are supplementary	2. Linear Pair (Supplement) Theorem
3. $m\angle 2 + m\angle 3 = 180$	3. Given
4. $\angle 2$ and $\angle 3$ are supplementary	4. Definition of Supplementary Angles
5. $\angle 1 \cong \angle 3$	5. Congruent Supplements Thm.

9 **Given:** $\overline{AB} \perp \overline{BC}$, $\angle 2$ and $\angle 3$ are complementary
Prove: $\angle 1 \cong \angle 2$



Statements	Reasons
1. $\overline{AB} \perp \overline{BC}$	1. Given
2. $\angle ABC$ is a right angle	2. Def. of Perpendicular
3. $m\angle ABC = 90°$	3. Definition of a Right Angle
4. $m\angle 1 + m\angle 3 = m\angle ABC$	4. Angle Addition Postulate
5. $m\angle 1 + m\angle 3 = 90°$	5. Transitive Property
6. $\angle 1$ and $\angle 3$ are complementary	6. Definition of Complementary Angles
7. $\angle 2$ and $\angle 3$ are complementary	7. Given
8. $\angle 1 \cong \angle 2$	8. Congruent Complements Thm.