



Geometry

Unit 3—Formal Proofs

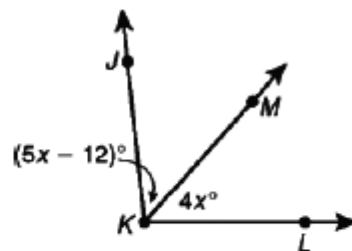
Day 15—algebraic proofs

Name: _____

Period: _____

When writing algebraic proofs in geometry, you can also use definitions, postulates, properties, and pieces of given information to justify the steps.

- $m\angle JKM = m\angle MKL$ Definition of congruent angles
- $(5x - 12)^\circ = 4x^\circ$ Substitution Property of Equality
- $x - 12 = 0$ Subtraction Property of Equality
- $x = 12$ Addition Property of Equality



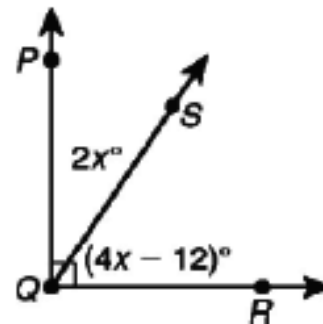
Properties of Congruence	Symbols	Examples
Reflexive	figure $A \cong$ figure A	$\angle CDE \cong \angle CDE$
Symmetric	If figure $A \cong$ figure B , then figure $B \cong$ figure A .	If $\overline{JK} \cong \overline{LM}$, then $\overline{LM} \cong \overline{JK}$.
Transitive	If figure $A \cong$ figure B and figure $B \cong$ figure C , then figure $A \cong$ figure C .	If $\angle N \cong \angle P$ and $\angle P \cong \angle Q$, then $\angle N \cong \angle Q$.

State the reason for each of the steps below:



Statement	Reason
Step 1: $CE = CD + DE$	_____
Step 2: $6x = 8 + (3x + 7)$	_____
Step 3: $6x = 15 + 3x$	_____
Step 4: $3x = 15$	_____
Step 5: $x = 5$	_____

State the reason for each of the steps below:



Statement	Reasons
Step 1: $m\angle PQR = m\angle PQS + m\angle SQR$	_____
Step 2: $90^\circ = 2x^\circ + (4x - 12)^\circ$	_____
Step 3: $90 = 6x - 12$	_____
Step 4: $102 = 6x$	_____
Step 5: $17 = x$	_____