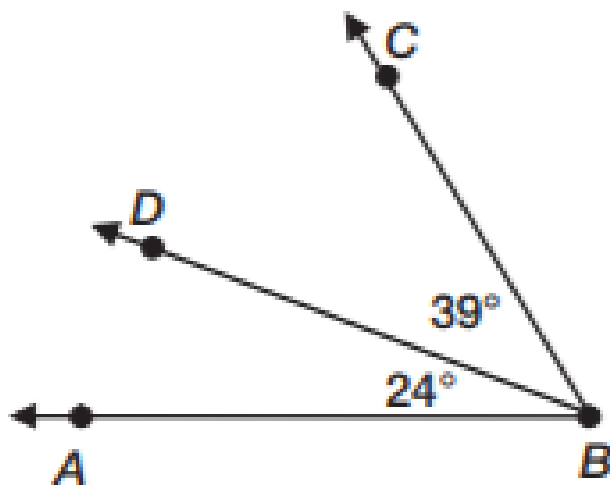# Name the property/postulate illustrated

1) If $\overline{RS} \cong \overline{TW}$ and $\overline{TW} \cong \overline{PQ}$, then $\overline{RS} \cong \overline{PQ}$.

2)
$$GH = JK$$
$$GH - RS = JK - RS$$

3)

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

Considering what you know about angles, you might conjecture that if two angles are supplements of the same angle or of congruent angles, then the angles are congruent. Let's prove that this conjecture is true.

1. **Use the diagram to write the "Given" statements for the Congruent Supplement Theorem. The "Prove" statement is provided.**
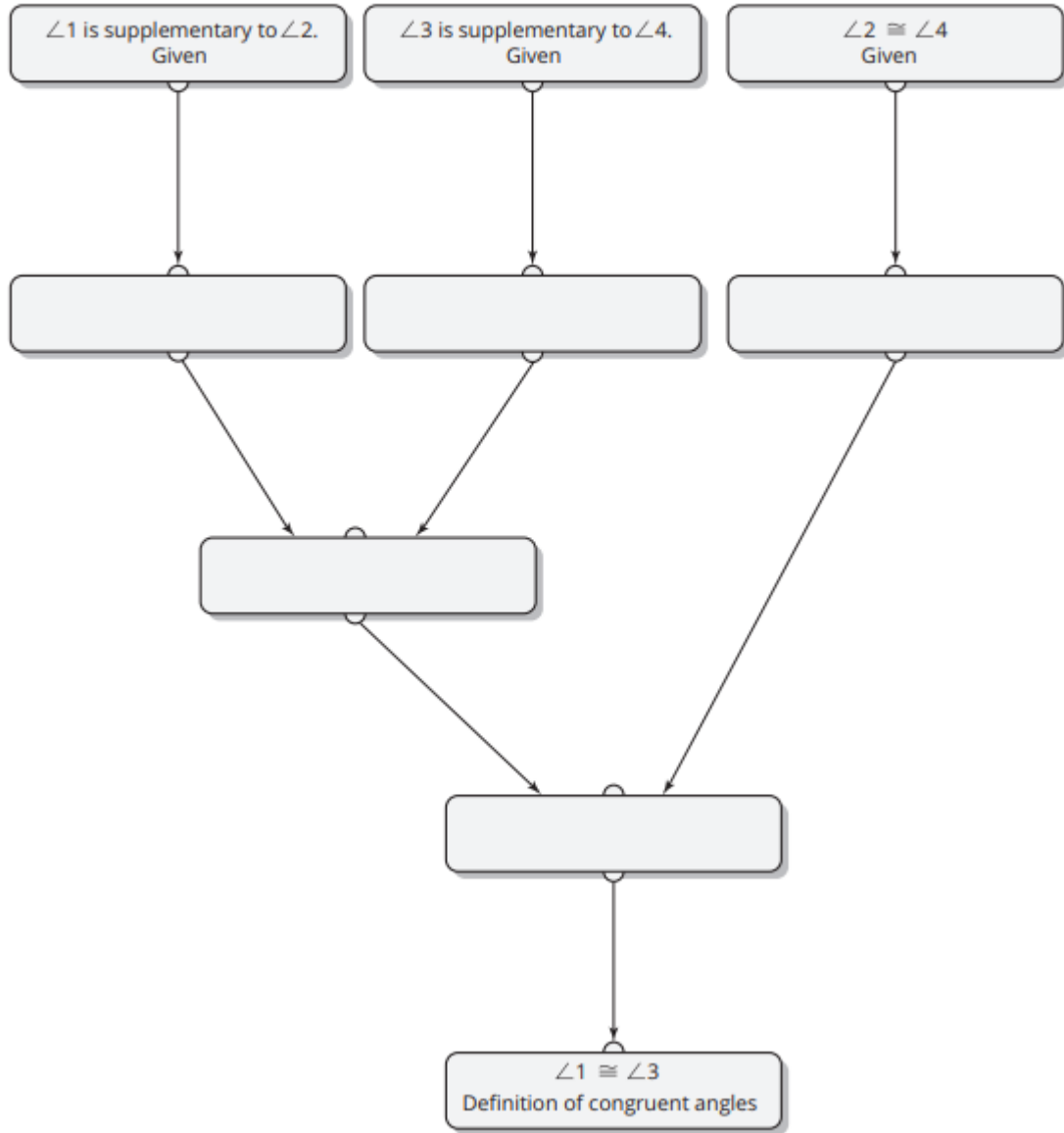
   Given:

   Given:

   Given:

   Prove: ∠1 ≅ ∠3

2. Cut out and use the statements and reasons located at the end of the lesson to complete the flow chart to prove the conjecture.

∠1 is supplementary to ∠2.
Given

∠3 is supplementary to ∠4.
Given

∠2 ≅ ∠4
Given

[blank box]

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[blank box]

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[blank box]

∠1 ≅ ∠3
Definition of congruent angles

m∠2 = m∠4
Definition of congruent angles

m∠1 + m∠2 = m∠3 + m∠4
Substitution Property

m∠1 = m∠3
Subtraction Property of Equality

m∠1 + m∠2 = 180°
Definition of supplementary angles

m∠3 + m∠4 = 180°
Definition of supplementary angles

Statements	Reasons
1. $\angle 1$ is supplementary to $\angle 2$.	1. Given
2. $\angle 3$ is supplementary to $\angle 4$.	2. Given
3. $\angle 2 \equiv \angle 4$	3. Given
4.	4.
5.	5.
6.	6.
7.	7.
8.	8.
9. $\angle 1 \equiv \angle 3$	9. Definition of congruent angles
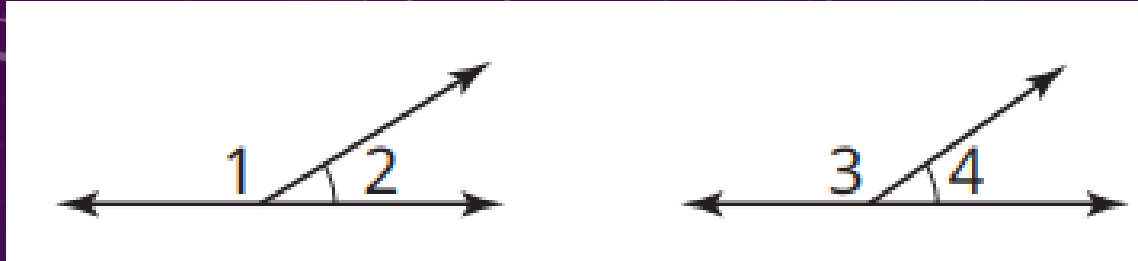
Because you have proved that this conjecture is true, you may now refer to it as a theorem. The **Congruent Supplement Theorem** states: "If two angles are supplements of the same angle or of congruent angles, then the angles are congruent."

1. Choose the correct property or theorem for each statement.

a. $\angle H \cong \angle K$

$\angle K \cong \angle M$
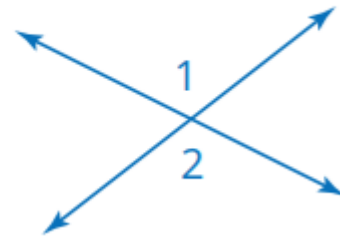
Therefore $\angle H \cong \angle M$

b. $m\overline{MN} = m\overline{OP}$

$m\overline{MN} + m\overline{RS} = m\overline{OP} + m\overline{RS}$

c. $m\angle T = 34°$

$m\angle W = 34°$

Therefore $m\angle T = m\angle W$

d. $m\angle A + m\angle B = 180°$

$m\angle A + m\angle C = 180°$

Therefore $\angle B \cong \angle C$

e. $m\angle V = m\angle V$

f. $\angle 1 \cong \angle 2$

Property or Theorem

Addition Property of Equality

Congruent Supplement Theorem

Reflexive Property

Substitution

Transitive Property

Vertical Angle Theorem