

Reteaching 2-5

Proving Angles Congruent

OBJECTIVE: Using deductive reasoning to solve problems and verify conjectures

MATERIALS: None

Example

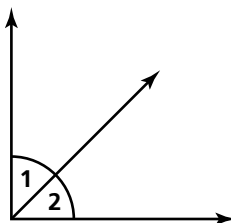
Suppose that two complementary angles are congruent. Prove that the measure of each angle is 45.

Given: $\angle 1$ and $\angle 2$ are complementary.

$$m\angle 1 = m\angle 2$$

Prove: $m\angle 1 = 45$ and $m\angle 2 = 45$

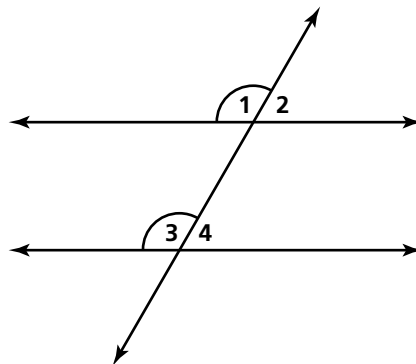
By the definition of complementary angles, $m\angle 1 + m\angle 2 = 90$. By substitution, $m\angle 1 + m\angle 1 = 90$. Using the Addition Property of Equality, $2m\angle 1 = 90$. Using the Division Property of Equality, $m\angle 1 = 45$. By substitution, $m\angle 2 = 45$.



Exercises

In the diagram, $m\angle 1 = m\angle 3$. Order the steps given below to prove that $m\angle 2 = m\angle 4$.

1. By the Angle Addition Postulate, $m\angle 3 + m\angle 4 = 180$.
2. Prove: $m\angle 2 = m\angle 4$
3. By substitution, $m\angle 3 + m\angle 2 = m\angle 3 + m\angle 4$.
4. By the Angle Addition Postulate, $m\angle 1 + m\angle 2 = 180$.
5. Given: $m\angle 1 = m\angle 3$
6. $m\angle 1 + m\angle 2 = m\angle 3 + m\angle 4$ by the Transitive Property of Equality.
7. Subtract $m\angle 3$ from both sides, and you get $m\angle 2 = m\angle 4$.



In the diagram, $\angle 7$ and $\angle 8$ are congruent, and $\angle 10$ is a right angle. Explain why each statement is true.

8. $m\angle 8 = 45$
9. $\angle 9$ and $\angle 10$ are supplementary.
10. $\angle 6$ is a right angle.

