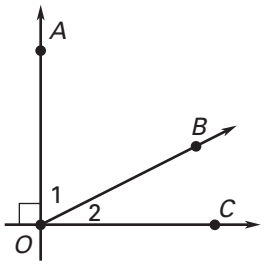
LESSON 2.6

NAME _____ DATE _____

Challenge: Skills and Applications

For use with pages 109–116

1. **a.** Use the diagram shown to write a two-column proof of the following theorem: If the nonshared sides of two adjacent acute angles are perpendicular, then the angles are complementary.



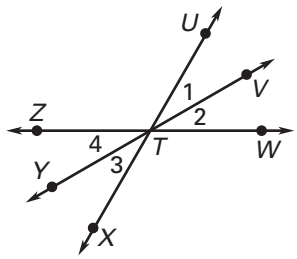
b. Explain why the word *acute* is necessary in the statement of the theorem.

c. Explain how your proof used the fact that the angles are acute.

2. Write a two-column proof.

Given: $\overrightarrow{TV}$ bisects $\angle UTW$

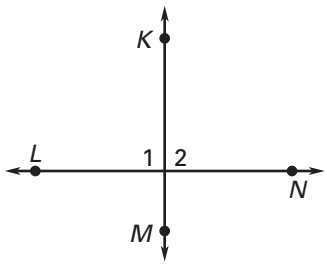
Prove: $\overrightarrow{TY}$ bisects $\angle XTZ$



3. Write a paragraph proof to show that if two lines form congruent adjacent angles, then the lines are perpendicular.

Given: $\angle 1 \cong \angle 2$

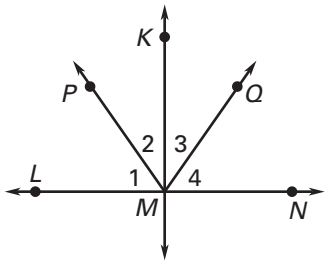
Prove: $\overleftrightarrow{KM} \perp \overleftrightarrow{LN}$



4. Write a paragraph proof. You may use the result of Exercise 3.

Given: $\overrightarrow{MK}$ bisects $\angle PMQ$; $\angle 1 \cong \angle 4$

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



5. In the diagram, $\overrightarrow{OB}$ bisects $\angle AOC$, and $\overrightarrow{OD}$ bisects $\angle COE$.

a. Make a conjecture about the relationship between $\overrightarrow{OB}$ and $\overrightarrow{OD}$.

b. Write a two-column proof that your conjecture is correct.