NAME KEY CLASS ______ DATE ______

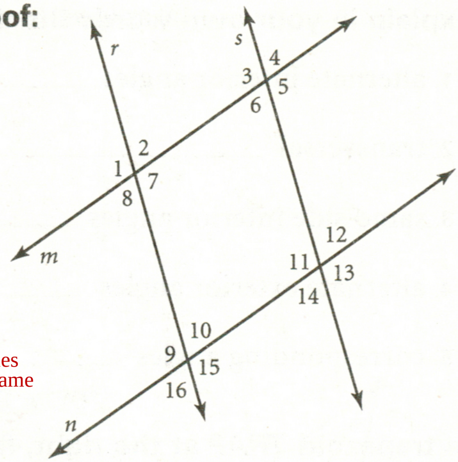
Practice Masters Level A

3.4 Proving That Lines are Parallel

Use the figure at right to complete the two-column proof:

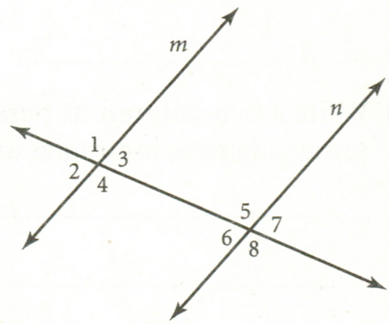
Given: $\angle 4 \cong \angle 14$; $m\angle 11 + m\angle 8 = 180°$

Prove: $r \parallel s$



Statements	Reasons
$\angle 4 \cong \angle 14$	1. Given
$m \parallel n$	2. Transversal with congruent alternate exterior angles means || lines
$m\angle 11 + m\angle 8 = 180°$	3. Given
$m\angle 8 + m\angle 9 = 180°$	4. Transversal with || lines means supplementary same-side interior angles
$m\angle 9 = m\angle 11$	5. If two angles are supplements of the same angle, then the angles are congruent
$r \parallel s$	6. Transversal with congruent corresponding angles means || lines

For Exercises 7–10, refer to the diagram at right, and fill in the name of the appropriate theorem or postulate.



7. If $m\angle 3 = m\angle 6$, then $m \parallel n$ by the Converse of the

   Alternate Interior Angles Theorem.

8. If $m\angle 2 = m\angle 6$, then $m \parallel n$ by the Converse of the

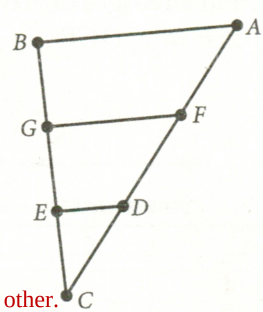
   Corresponding Angles Postulate.

9. If $m\angle 2 = m\angle 7$, then $m \parallel n$ by the Converse of the

   Alternate Exterior Angles Theorem.

10. If $\angle 3$ and $\angle 5$ are supplementary, then $m \parallel n$ by the Converse of the Same-Side Interior Angles Theorem.

For Exercises 11–12, use the figure at right.



11. If $\overline{BA} \perp \overline{BC}$ and $\overline{ED} \perp \overline{EC}$, what is the relationship between $\overline{BA}$ and $\overline{ED}$? Explain.

    BA || ED because two coplanar lines perpendicular to the same line are || each other.

12. If $\overline{DE} \parallel \overline{BA}$ and $\overline{GF} \parallel \overline{DE}$, what is the relationship between $\overline{BA}$ and $\overline{GF}$? Explain. BA || GF because two coplanar lines || the same line are || each other.

NAME KEY CLASS ______ DATE ______

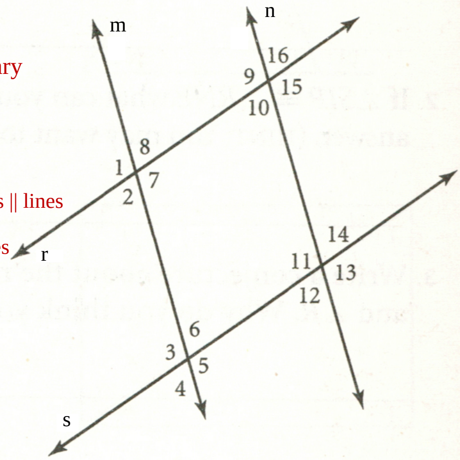
Practice Masters Level B

3.4 Proving That Lines are Parallel

Use the figure at right to complete the two-column proof:

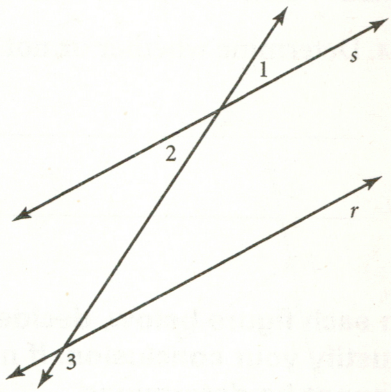
Given: $\angle 4 \cong \angle 16$; $m\angle 4 + m\angle 1 = 180°$
Prove: $m \parallel n$

Statements	Reasons
$m\angle 4 + m\angle 3 = 180°$	1. Two angles forming a linear pair are supplementary
$m\angle 4 + m\angle 1 = 180°$	2. Given
$m\angle 1 = m\angle 3$	3. If two angles are supplements of the same angle, then the angles are congruent
$r \parallel s$	4. Transversal with congruent corresponding angles means || lines
$m\angle 2 = m\angle 4$	5. Transversal with || lines means congruent corresp. angles
$m\angle 2 = m\angle 8$	6. Vertical angles are congruent
$m\angle 4 = m\angle 8$	7. Transitive Property of Congruence
$m\angle 4 = m\angle 16$	8. Given
$m\angle 8 = m\angle 16$	9. Transitive Property of Congruence
$m \parallel n$	10. Transversal with congruent corresponding angles means || lines.



11. In the figure at right, $m\angle 1 = 3x + 14$, $m\angle 2 = 9x - 14$, and $m\angle 3 = 30x + 14$. Determine whether or not $r \parallel s$. Justify your answer.

Lines r and s are NOT parallel. Since angle 1 is congruent to angle 2 (because they are vertical angles), x = 14/3. When that value is plugged back in, the measure of angle 1 and the measure of angle 2 = 28 degrees, and the measure of angle 3 equals 154 degrees. But 154 degrees plus 28 degrees does not equal 180 degrees, so the lines are not parallel.



Use the figure at right for the statements in Exercises 12–15. What conclusion can you draw from each statement? Justify your answer.

12. $m\angle 1 = m\angle 4$ m || n from Converse of Alternate Interior Angles Theorem

13. $m \perp t$ and $m \perp q$ t || q since two coplanar lines perp. to same line are || each other

14. $s \parallel q$ and $t \parallel q$ s || t since two coplanar lines || same line means they are || each other

15. $m\angle 3 = m\angle 1$ t || q from Converse of Alternate Exterior Angles Theorem