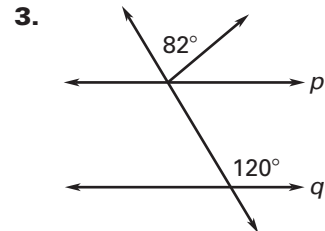
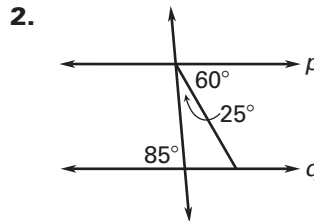
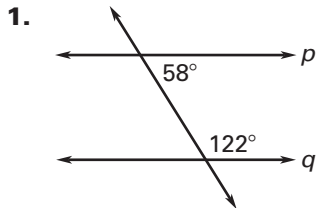


**LESSON**  
**3.3**

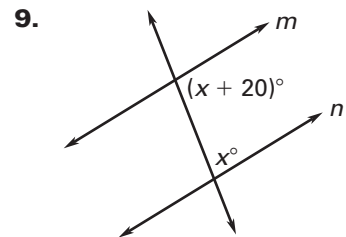
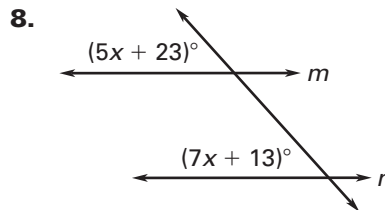
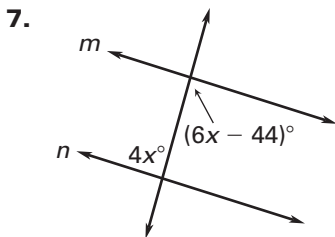
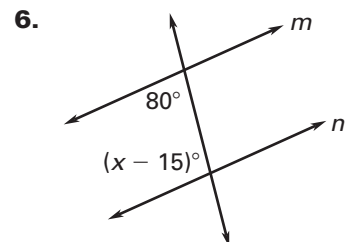
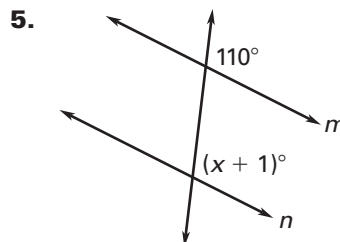
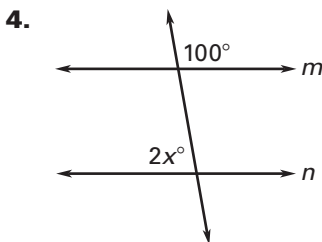
**Practice B**

For use with pages 165–173

Is there enough information to prove that lines  $p$  and  $q$  are parallel? If so, state the postulate or theorem you would use.

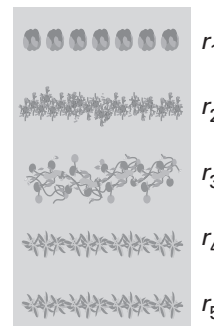


Find the value of  $x$  that makes  $m \parallel n$ .



In Exercises 10–12, choose the word that best completes the statement.

10. If two lines are cut by a transversal so the alternate interior angles are (*congruent*, *supplementary*, *complementary*), then the lines are parallel.
11. If two lines are cut by a transversal so the consecutive interior angles are (*congruent*, *supplementary*, *complementary*), then the lines are parallel.
12. If two lines are cut by a transversal so the corresponding angles are (*congruent*, *supplementary*, *complementary*), then the lines are parallel.
13. **Gardens** A garden has five rows of vegetables. Each row is parallel to the row immediately next to it. Explain why the first row is parallel to the last row.



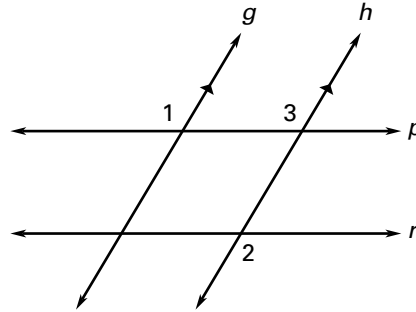
**LESSON 3.3**

**Practice B** *continued*  
For use with pages 165–173

**In Exercises 14–18, complete the two-column proof.**

**GIVEN:**  $g \parallel h$ ,  $\angle 1 \cong \angle 2$

**PROVE:**  $p \parallel r$

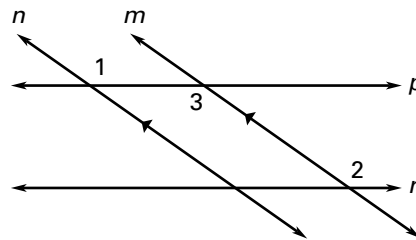


Statements	Reasons
$g \parallel h$	14. _____ ?
$\angle 1 \cong \angle 3$	15. _____ ?
$\angle 1 \cong \angle 2$	16. _____ ?
$\angle 2 \cong \angle 3$	17. _____ ?
$p \parallel r$	18. _____ ?

**19.** Use the diagram and the given information to write a two-column proof and a paragraph proof. Compare the two proofs.

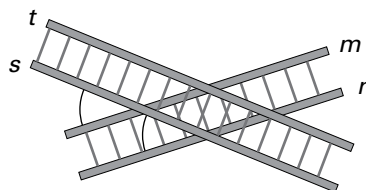
**GIVEN:**  $n \parallel m$ ,  $\angle 1 \cong \angle 2$

**PROVE:**  $p \parallel r$



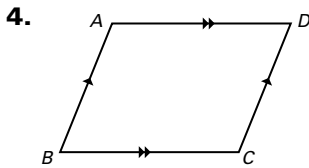
Statements	Reasons

**20. Railroad Tracks** Two sets of railroad tracks intersect as shown. How do you know that line  $n$  is parallel to line  $m$ ?



## Lesson 3.2, continued

3.  $m\angle 1 = 100^\circ$ ,  $m\angle 2 = 80^\circ$ ,  $m\angle 3 = 80^\circ$ ,  
 $m\angle 4 = 100^\circ$ ,  $m\angle 5 = 100^\circ$ ,  $m\angle 6 = 56^\circ$ ,  
 $m\angle 7 = 24^\circ$ ,  $m\angle 8 = 24^\circ$ ,  $m\angle 9 = 56^\circ$ ,  
 $m\angle 10 = 100^\circ$ ,  $m\angle 11 = 156^\circ$ ,  $m\angle 12 = 24^\circ$ ,  
 $m\angle 13 = 24^\circ$ ,  $m\angle 14 = 156^\circ$ ,  $m\angle 15 = 124^\circ$ ,  
 $m\angle 16 = 56^\circ$ ,  $m\angle 17 = 124^\circ$ ,  $m\angle 18 = 56^\circ$ ,  
 $m\angle 19 = 100^\circ$ ,  $m\angle 20 = 80^\circ$ ,  $m\angle 21 = 100^\circ$ ,  
 $m\angle 22 = 80^\circ$ ,  $m\angle 23 = 156^\circ$ ,  $m\angle 24 = 24^\circ$ ,  
 $m\angle 25 = 24^\circ$ ,  $m\angle 26 = 156^\circ$ ,  $m\angle 27 = 100^\circ$ ,  
 $m\angle 28 = 56^\circ$ ,  $m\angle 29 = 24^\circ$ ,  $m\angle 30 = 24^\circ$ ,  
 $m\angle 31 = 56^\circ$ ,  $m\angle 32 = 100^\circ$



Statements	Reasons
1. $\overline{AB} \parallel \overline{DC}$ , $\overline{AD} \parallel \overline{BC}$	1. Given
2. $\angle A$ and $\angle B$ and $\angle B$ and $\angle C$ are supplementary.	2. Consecutive Interior Angles Theorem
3. $m\angle A + m\angle B = 180^\circ$ , $m\angle B + m\angle C = 180^\circ$	3. Definition of supplementary angles
4. $m\angle A + m\angle B = m\angle B + m\angle C$	4. Substitution Property of Equality
5. $m\angle A = m\angle C$	5. Subtraction Property of Equality
6. $\angle A \cong \angle C$	6. Definition of congruent angles

5.  $x = 67$ ; Draw a line through the angle  $x^\circ$  that is parallel to both  $m$  and  $n$ . Then using the Alternate Interior Angles Theorem and the definition of supplementary angles, you can determine that  $x = 35 + 32 = 67$ .

## Lesson 3.3

### Practice Level A

1. yes; Corresponding Angles Converse  
 2. yes; Alternate Interior Angles Converse  
 3. yes; Alternate Exterior Angles Converse  
 4. yes; Corresponding Angles Converse  
 5. no 6. yes; Alternate Interior Angles Converse  
 7. 40 8. 30 9. 30 10. 14 11. 32 12. 95  
 13. C 14.  $m \parallel n$  15.  $p \parallel q$  16.  $p \parallel q$

17. neither 18. Given; Corresponding Angles Postulate; Given; Transitive Property of Congruence; Corresponding Angles Converse

19. Each lane is parallel to the one next to it, so  $l_1 \parallel l_2$ ,  $l_2 \parallel l_3$ , and  $l_3 \parallel l_4$ . Then  $l_1 \parallel l_3$  by the Transitive Property of Parallel Lines. By continuing this reasoning,  $l_1 \parallel l_4$ . So, the first lane is parallel to the last lane.

### Practice Level B

1. yes; Consecutive Interior Angles Converse  
 2. yes; Alternate Interior Angles Converse  
 3. no 4. 40 5. 109 6. 115 7. 22 8. 5 9. 80  
 10. congruent 11. supplementary 12. congruent  
 13. Each row is parallel to the one next to it, so  $r_1 \parallel r_2$ ,  $r_2 \parallel r_3$ , and so on. Then  $r_1 \parallel r_3$  by the Transitive Property of Parallel Lines. By continuing this reasoning,  $r_1 \parallel r_5$ . So, the first row is parallel to the last row. 14. Given  
 15. Corresponding Angles Postulate 16. Given  
 17. Transitive Property of Equality 18. Alternate Exterior Angles Converse

19.

Statements	Reasons
1. $n \parallel m$	1. Given
2. $\angle 1 \cong \angle 3$	2. Alternate Interior Angles Theorem
3. $\angle 1 \cong \angle 2$	3. Given
4. $\angle 2 \cong \angle 3$	4. Transitive Property of Congruence
5. $p \parallel r$	5. Alternate Interior Angles Converse

It is given that  $n \parallel m$ . By the Alternate Interior Angles Theorem,  $\angle 1 \cong \angle 3$ . It is also given that  $\angle 1 \cong \angle 2$ . So by the Transitive Property of Congruence,  $\angle 2 \cong \angle 3$ . Therefore, by the Alternate Interior Angles Converse,  $p \parallel r$ .

The two proofs use the same given information, theorems, and properties, but the two-column proof uses numbered statements and reasons, while the paragraph proof uses sentences and a conversational style.

20. Corresponding Angles Converse