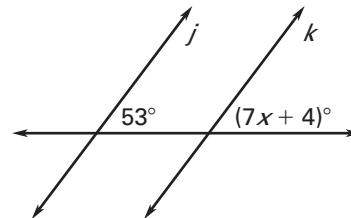


LESSON
3.3**Study Guide**

For use with pages 161–169

GOAL Use angle relationships to prove that lines are parallel.**Vocabulary**A proof can be written in paragraph form, called a **paragraph proof**.**Postulate 16 Corresponding Angles Converse:** If two lines are cut by a transversal so the corresponding angles are congruent, then the lines are parallel.**Theorem 3.4 Alternate Interior Angles Converse:** If two lines are cut by a transversal so the alternate interior angles are congruent, then the lines are parallel.**Theorem 3.5 Alternate Exterior Angles Converse:** If two lines are cut by a transversal so the alternate exterior angles are congruent, then the lines are parallel.**Theorem 3.6 Consecutive Interior Angles Converse:** If two lines are cut by a transversal so the consecutive interior angles are supplementary, then the lines are parallel.**Theorem 3.7 Transitive Property of Parallel Lines:** If two lines are parallel to the same line, then they are parallel to each other.**EXAMPLE 1** Apply the Corresponding Angles Converse**Find the value of x that makes $j \parallel k$.****Solution**Lines j and k are parallel if the marked corresponding angles are congruent.

$$(7x + 4)^\circ = 53^\circ$$

Use Postulate 16 to write an equation.

$$7x = 49$$

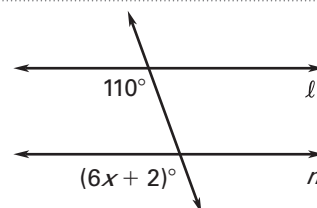
Subtract 4 from each side.

$$x = 7$$

Divide each side by 7.

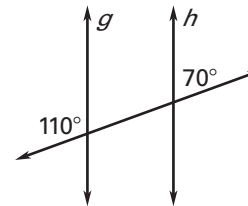
The lines j and k are parallel when $x = 7$.**Exercises for Example 1**

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



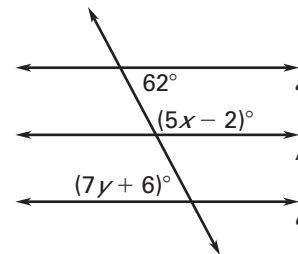
LESSON
3.3
Study Guide *continued*
 For use with pages 161–169

2. Is there enough information in the diagram to conclude that $g \parallel h$? Explain.


EXAMPLE 2 Show lines are parallel

Use the diagram at the right.

- a. Find the value of x that makes $a \parallel b$.
 b. Find the value of y that makes $a \parallel c$.


Solution

- a. Lines a and b are parallel if the marked consecutive interior angles are supplementary.

$$(5x - 2)^\circ + 62^\circ = 180^\circ$$

Use Theorem 3.6 to write an equation.

$$5x + 60 = 180$$

Combine like terms.

$$5x = 120$$

Subtract 60 from each side.

$$x = 24$$

Divide each side by 5.

The lines a and b are parallel when $x = 24$.

- b. Lines a and c are parallel if the marked alternate interior angles are congruent.

$$(7y + 6)^\circ = 62^\circ$$

Use Theorem 3.4 to write an equation.

$$7y = 56$$

Subtract 6 from each side.

$$y = 8$$

Divide each side by 7.

The lines a and c are parallel when $y = 8$.

Exercises for Example 2

Find the value of x that makes $p \parallel q$.

