

LESSON
3.2**Study Guide**

For use with pages 153–160

GOAL Use angles formed by parallel lines and transversals.**Vocabulary**

Postulate 15 Corresponding Angles Postulate: If two parallel lines are cut by a transversal, then the pairs of corresponding angles are congruent.

Theorem 3.1 Alternate Interior Angles Theorem: If two parallel lines are cut by a transversal, then the pairs of alternate interior angles are congruent.

Theorem 3.2 Alternate Exterior Angles Theorem: If two parallel lines are cut by a transversal, then the pairs of alternate exterior angles are congruent.

Theorem 3.3 Consecutive Interior Angles Theorem: If two parallel lines are cut by a transversal, then the pairs of consecutive interior angles are supplementary.

EXAMPLE 1 Identify congruent angles

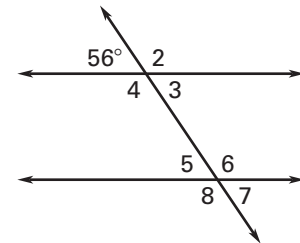
The measure of three of the numbered angles is 56° . Identify the angles. *Explain your reasoning.*

Solution

Using the Vertical Angles Congruence Theorem, $m\angle 3 = 56^\circ$.

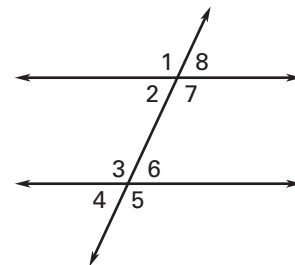
By the Corresponding Angles Postulate, $m\angle 5 = 56^\circ$.

Because $\angle 3$ and $\angle 7$ are corresponding angles, by the Corresponding Angles Postulate, you know that $m\angle 7 = 56^\circ$.

**Exercises for Example 1**

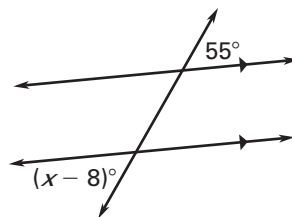
Use the diagram at the right.

- If $m\angle 2 = 65^\circ$, find three other angles that have a measure of 65° . *Explain your reasoning.*
- If $m\angle 5 = 115^\circ$, find three other angles that have a measure of 115° . *Explain your reasoning.*



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Study Guide *continued*
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EXAMPLE 2 Use properties of parallel lines

 Find the value of x .

Solution

$$x - 8 = 55 \quad \text{Alternate Exterior Angles Theorem}$$

$$x = 63 \quad \text{Add 8 to each side.}$$

Exercises for Example 2

 Find the value of x .
