

# 3-2 Study Guide and Intervention

## Angles and Parallel Lines

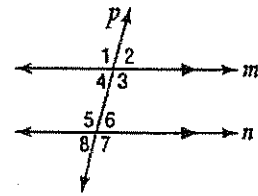
**Parallel Lines and Angle Pairs** When two parallel lines are cut by a transversal, the following pairs of angles are congruent.

- corresponding angles
- alternate interior angles
- alternate exterior angles

Also, consecutive interior angles are supplementary.

**Example**

In the figure,  $m\angle 2 = 75$ . Find the measures of the remaining angles.

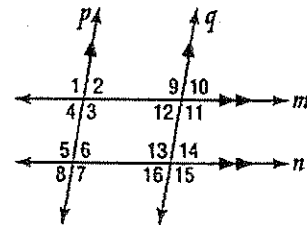


- $m\angle 1 = 105$   $\angle 1$  and  $\angle 2$  form a linear pair.
- $m\angle 3 = 105$   $\angle 3$  and  $\angle 2$  form a linear pair.
- $m\angle 4 = 75$   $\angle 4$  and  $\angle 2$  are vertical angles.
- $m\angle 5 = 105$   $\angle 5$  and  $\angle 3$  are alternate interior angles.
- $m\angle 6 = 75$   $\angle 6$  and  $\angle 2$  are corresponding angles.
- $m\angle 7 = 105$   $\angle 7$  and  $\angle 3$  are corresponding angles.
- $m\angle 8 = 75$   $\angle 8$  and  $\angle 6$  are vertical angles.

**Exercises**

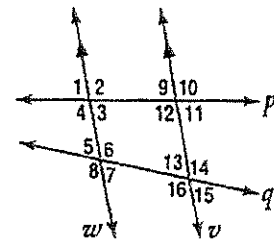
In the figure,  $m\angle 3 = 102$ . Find the measure of each angle.

- |                |                |
|----------------|----------------|
| 1. $\angle 5$  | 2. $\angle 6$  |
| 3. $\angle 11$ | 4. $\angle 7$  |
| 5. $\angle 15$ | 6. $\angle 14$ |



In the figure,  $m\angle 9 = 80$  and  $m\angle 5 = 68$ . Find the measure of each angle.

- |                |                 |
|----------------|-----------------|
| 7. $\angle 12$ | 8. $\angle 1$   |
| 9. $\angle 4$  | 10. $\angle 3$  |
| 11. $\angle 7$ | 12. $\angle 16$ |



LESSON 3-2

# 3-2 Study Guide and Intervention *(continued)*

## Angles and Parallel Lines

**Algebra and Angle Measures** Algebra can be used to find unknown values in angles formed by a transversal and parallel lines.

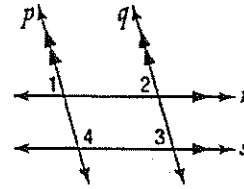
**Example** If  $m\angle 1 = 3x + 15$ ,  $m\angle 2 = 4x - 5$ ,  $m\angle 3 = 5y$ , and  $m\angle 4 = 6z + 3$ , find  $x$  and  $y$ .

$p \parallel q$ , so  $m\angle 1 = m\angle 2$   
because they are corresponding angles.

$$\begin{aligned} 3x + 15 &= 4x - 5 \\ 3x + 15 - 3x &= 4x - 5 - 3x \\ 15 &= x - 5 \\ 15 + 5 &= x - 5 + 5 \\ 20 &= x \end{aligned}$$

$r \parallel s$ , so  $m\angle 2 = m\angle 3$   
because they are corresponding angles.

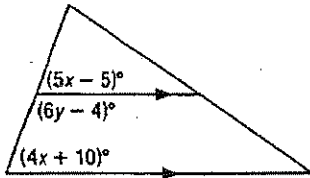
$$\begin{aligned} m\angle 2 &= m\angle 3 \\ 75 &= 5y \\ \frac{75}{5} &= \frac{5y}{5} \\ 15 &= y \end{aligned}$$



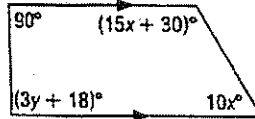
### Exercises

Find  $x$  and  $y$  in each figure.

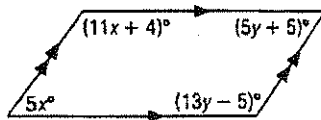
1.



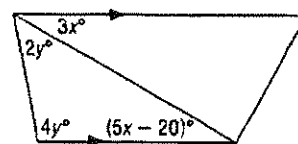
2.



3.

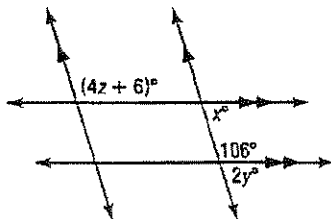


4.



Find  $x$ ,  $y$ , and  $z$  in each figure.

5.



6.

