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# LT 1.2 Study Guide and Intervention

## *Angles and Parallel Lines: Proofs*

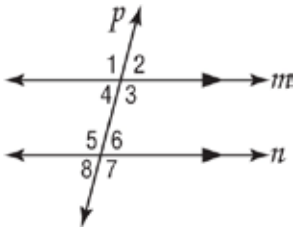
**Parallel Lines and Angle Pairs** When two parallel lines are cut by a transversal, the following pairs of angles are congruent.

- corresponding angles
- alternate interior angles
- alternate exterior angles

Also, consecutive interior angles are supplementary.

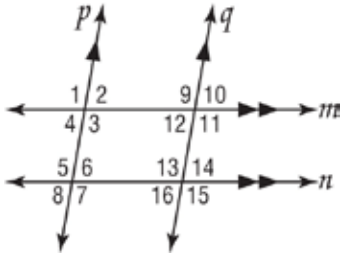
**Example: In the figure, $m\angle 2 = 75$. Find the measures of the remaining angles.**

$m\angle 1 = 105$ $\angle 1$ 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.**
**Tell which postulate(s) or theorem(s) you used. Use a two column-proof.**




**1.** $\angle 5$

**2.** $\angle 6$

**3.** $\angle 11$

**4.** $\angle 7$

**5.** $\angle 15$

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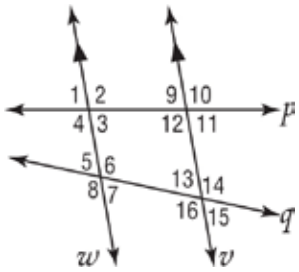
# LT 1.2 Study Guide and Intervention

## *Angles and Parallel Lines: Proofs*

**In the figure, $m\angle 9 = 80$ and $m\angle 5 = 68$. Find the measure of each angle. Tell which postulate(s) or theorem(s) you used. Use a two column proof.**




**7.** $\angle 12$

**8.** $\angle 1$

**9.** $\angle 4$

**10.** $\angle 3$

**11.** $\angle 7$

**12.** $\angle 16$

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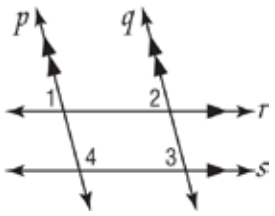
# LT 1.2 Study Guide and Intervention *(continued)*

## *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 $m\angle 1 = 3x + 15$, $m\angle 2 = 4x - 5$, and $m\angle 3 = 5y$, find the value of $x$ and $y$.**




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

$$m\angle 1 = m\angle 2$$
$$3x + 15 = 4x - 5$$
$$3x + 15 - 3x = 4x - 5 - 3x$$
$$15 = x - 5$$
$$15 + 5 = x - 5 + 5$$
$$20 = x$$

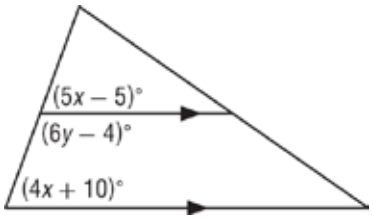
$r \parallel s$, so $m\angle 2 = m\angle 3$ because they are corresponding angles.

$$m\angle 2 = m\angle 3$$
$$75 = 5y$$
$$\frac{75}{5} = \frac{5y}{5}$$
$$15 = y$$

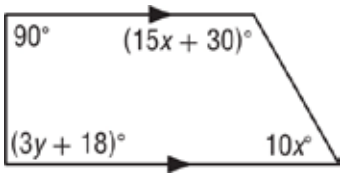
### Exercises

**Find the value of the variable(s) in each figure. Explain your reasoning (Justify)**

**1.**



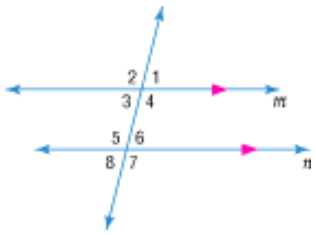

**2.**



**LT 1.2 Angles and Parallel Lines**

**Example 1: Use Corresponding Angles Postulate**
**In the figure, *m*Ð8 = 121. Find the measure of each angle. Tell which postulates (or theorems) you used. Use a two column proof.**

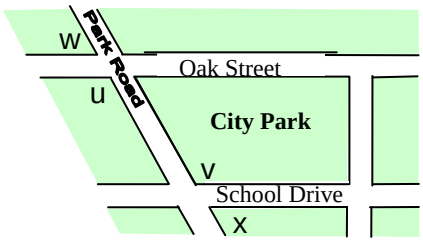
**a. Ð3**




**b. Ð1**

**Real-World Example 2: Use Theorems about Parallel Lines**
**MAPS School Drive and Oak Street are parallel streets that intersect Park Road along the west side of City Park.**

**If *m*Ð1 = 122, find *m*Ð2. Use a two column proof.**

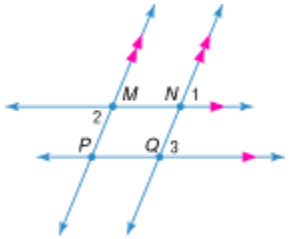


**Example 3: Find Values of Variables**

**ALGEBRA Use the figure at the right to find the indicated variable. Explain your reasoning (Justify your answer)**

**If $m\angle 1 = 16x - 8$, $m\angle 2 = 4(y + 8)$, and $m\angle 3 = 14x + 2$, find $x$ and $y$.**

**a. If $m\angle 1 = 16x - 8$, $m\angle 2 = 4(y + 8)$, and $m\angle 3 = 14x + 2$, find $x$.**

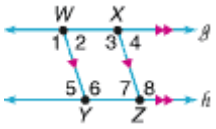



**b. If $m\angle 1 = 16x - 8$, $m\angle 2 = 4(y + 8)$, and $m\angle 3 = 14x + 2$, find $y$**

Self-Check Quizzes

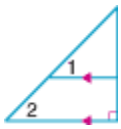
**LT 1.2 Angles and Parallel Lines**

1. Find the measure of $\angle 2$ if $g \parallel h$, $\overline{WY} \parallel \overline{XZ}$, and $m\angle 5 = 70$.



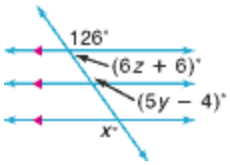

- ☐ 60
- ☐ 110
- ☐ 70
- ☐ 65

2. Find the measure of $\angle 2$ if $m\angle 1 = 8y - 6$ and $m\angle 2 = 7y$.



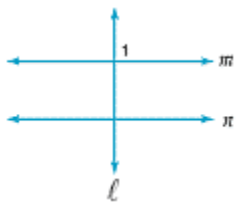

- ☐ 56
- ☐ 49
- ☐ 35
- ☐ 42

3. What is the value of *y*?



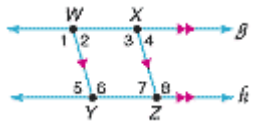

- ☐ 24
- ☐ 30
- ☐ 26
- ☐ 28

4. If line *m* and *n* are parallel and *l* is perpendicular to *m*, then _____.




- ☐ *l* and *n* are skew lines.
- ☐ *m* is parallel to *n*.
- ☐ *l* is parallel to *n*.
- ☐ *l* is perpendicular to *n*.

5. In the picture, if $m \angle 2 = 8x + 8$ and $m \angle 6 = 4x + 28$, what is $m \angle 2$?




- 76
- 96
- 90
- 104