

Reteaching 8-2

Angles and Parallel Lines

Look at the figure at the right.

- Line \overleftrightarrow{AB} is parallel to line \overleftrightarrow{CD} ($\overleftrightarrow{AB} \parallel \overleftrightarrow{CD}$).
- Line \overleftrightarrow{EF} is a transversal.

Alternate interior angles lie within a pair of lines and on opposite sides of the transversal.

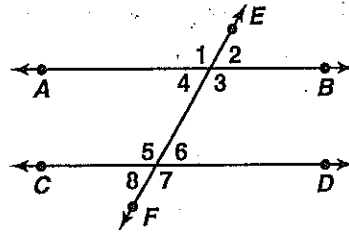
Example 1: $\angle 3$ and $\angle 5$, $\angle 4$ and $\angle 6$

Alternate interior angles are congruent. If $m\angle 4$ is 60° , then $m\angle 6$ is also 60° .

Corresponding angles lie on the same side of the transversal and in corresponding positions.

Example 2: $\angle 1$ and $\angle 5$, $\angle 3$ and $\angle 7$

Corresponding angles are congruent. If $m\angle 1$ is 120° , then $m\angle 5$ is also 120° .



Use the diagram at the right to complete Exercises 1-2.

1. Name the alternate interior angles.

a. $\angle 11$ and $\angle ?$

b. $\angle 12$ and $\angle ?$

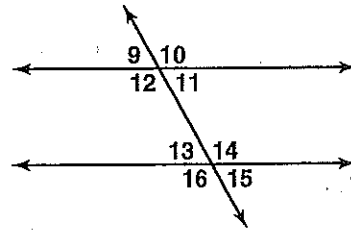
2. Name the corresponding angles.

a. $\angle 16$ and $\angle ?$

b. $\angle 14$ and $\angle ?$

c. $\angle 9$ and $\angle ?$

d. $\angle 11$ and $\angle ?$



In the diagram at the right, $\ell \parallel m$. Find the measure of each angle.

3. $\angle 1$

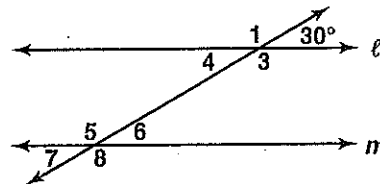
4. $\angle 3$

5. $\angle 6$

6. $\angle 5$

7. $\angle 8$

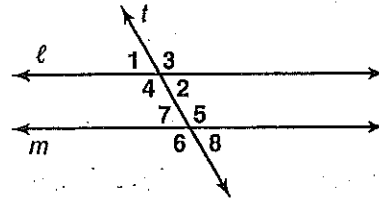
8. $\angle 7$



Practice 8-2

Angles and Parallel Lines

Identify each pair of angles as *vertical*, *adjacent*, *corresponding*, *alternate interior*, or *none of these*.



1. $\angle 7, \angle 5$

2. $\angle 1, \angle 2$

3. $\angle 1, \angle 5$

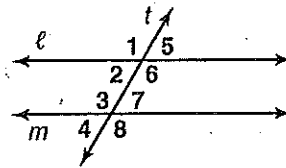
4. $\angle 1, \angle 7$

5. $\angle 4, \angle 7$

6. $\angle 4, \angle 5$

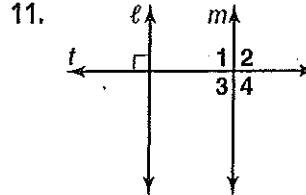
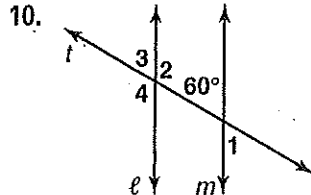
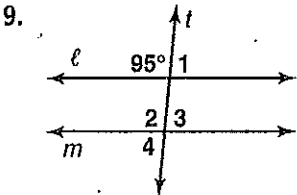
Use the diagram at the right for Exercises 7 and 8.

7. Name four pairs of corresponding angles.



8. Name two pairs of alternate interior angles.

In each diagram below, $\ell \parallel m$. Find the measure of each numbered angle.



$m\angle 1 =$ _____

$m\angle 1 =$ _____

$m\angle 1 =$ _____

$m\angle 2 =$ _____

$m\angle 2 =$ _____

$m\angle 2 =$ _____

$m\angle 3 =$ _____

$m\angle 3 =$ _____

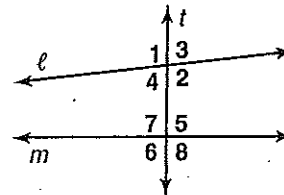
$m\angle 3 =$ _____

$m\angle 4 =$ _____

$m\angle 4 =$ _____

$m\angle 4 =$ _____

12. Use the figure at the right. Is line ℓ parallel to line m ? Explain how you could use a protractor to support your conjecture.



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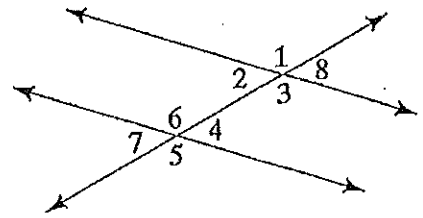
EXERCISES

For more practice, see *Extra Practice*.

A Practice by Example

Example 1
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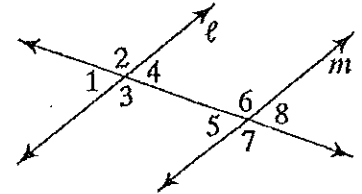
1. $\angle 6, \angle 3$
2. $\angle 8, \angle 4$
3. $\angle 2, \angle 1$
4. $\angle 2, \angle 4$
5. $\angle 1, \angle 5$
6. $\angle 2, \angle 7$
7. $\angle 3, \angle 5$
8. $\angle 4, \angle 3$



Example 2
(page 414)

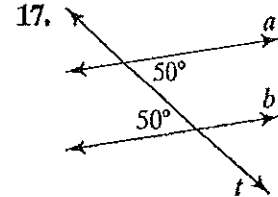
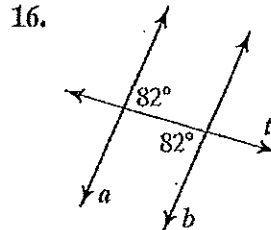
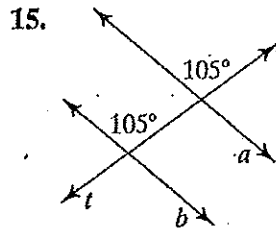
In the diagram at the right, $\ell \parallel m$.
If $m\angle 3 = 122^\circ$, find the measure of each angle.

9. $\angle 4$
10. $\angle 2$
11. $\angle 6$
12. $\angle 7$
13. $\angle 8$
14. $\angle 5$



Example 3
(page 415)

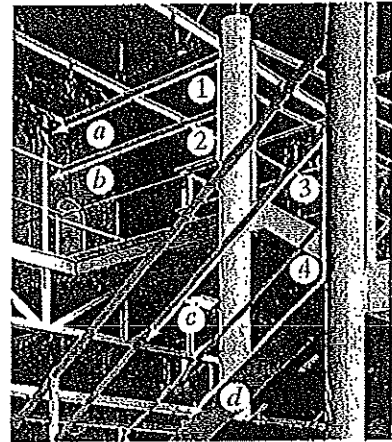
For each diagram, explain why $a \parallel b$.



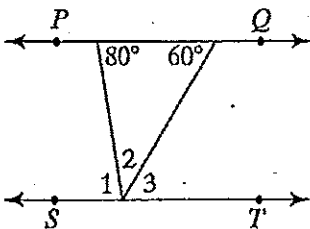
B Apply Your Skills

18. **Architecture** The photo at the right contains examples of parallel lines cut by transversals.

- a. Name a pair of corresponding angles.
- b. $a \parallel b$ and $m\angle 1 = 68^\circ$. Find $m\angle 2$.
- c. $c \parallel d$ and $m\angle 3 = 42^\circ$. Find $m\angle 4$.

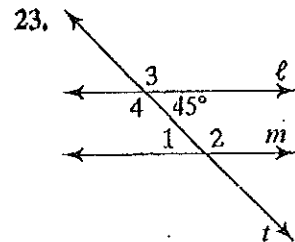
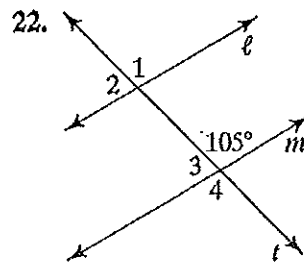
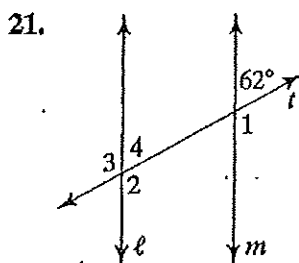


19. a. **Writing in Math** A transversal t cuts parallel lines m and n . If t is perpendicular to m , what is the relationship between lines t and n ?
- b. What are the measures of all the angles formed? Explain.



20. a. In the diagram at the left, $\overleftrightarrow{PQ} \parallel \overleftrightarrow{ST}$. Find the measure of each numbered angle.
- b. What is the sum of the angle measures of the triangle?

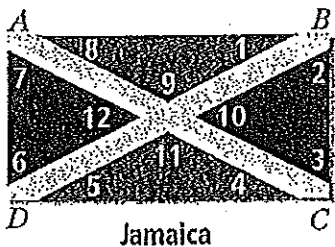
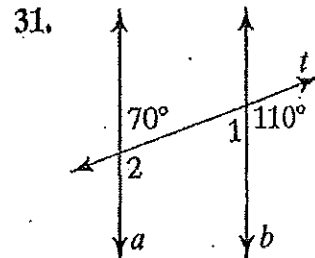
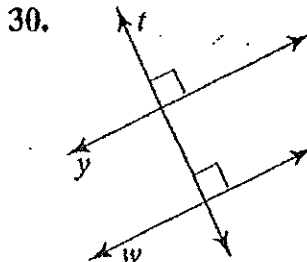
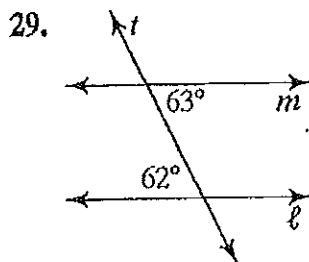
In each diagram, $\ell \parallel m$. Find the measure of each numbered angle.



Reasoning Determine whether each statement is *true* or *false*. Draw a diagram to justify your answer.

24. A transversal is a line that crosses two other lines at different points. The two lines may or may not be parallel.
25. Alternate interior angles are always congruent.
26. Two lines are cut by a transversal. If the corresponding angles are *not* congruent, then the two lines are *not* parallel.
27. Vertical angles are always congruent.

Determine which pairs of lines, if any, are parallel. Explain.

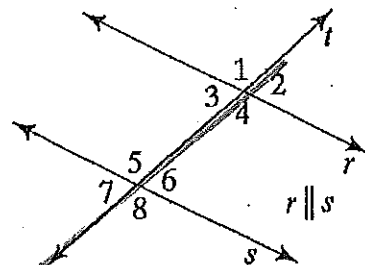


Flags Use the flag of Jamaica at the left for Exercises 32 and 33.

32. Name two pairs of parallel lines and two transversals.
33. Name four pairs of alternate interior angles.

34. **Reasoning** Corresponding angles are on the same side of a transversal. Alternate interior angles are on opposite sides of a transversal.

- a. Use the diagram at the right. Name a pair of angles that fits the definition of corresponding angles but is *not* a pair of corresponding angles.
- b. Name a pair of angles that fits the definition of alternate interior angles but is *not* a pair of alternate interior angles.



Challenge

Algebra In each diagram below, $p \parallel q$. Write and solve an equation to find the measures of $\angle 1$ and $\angle 2$.

