

CHAPTER 3

Study Guide and Review

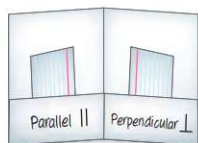


Download Vocabulary
Review from ca.geometryonline.com

FOLDABLES Study Organizer

GET READY to Study

Be sure the following
Key Concepts are noted
in your Foldable.



Key Concepts

Transversals (Lessons 3-1 and 3-2)

- If two parallel lines are cut by a transversal, then each of the following is true.
 - Each pair of alternate interior angles is congruent,
 - each pair of consecutive interior angles is supplementary, and
 - each pair of alternate exterior angles is congruent.

Slope (Lessons 3-3 and 3-4)

- The slope m of a line containing two points with coordinates (x_1, y_1) and (x_2, y_2) is $m = \frac{y_2 - y_1}{x_2 - x_1}$, where $x_1 \neq x_2$.

Proving Lines Parallel (Lesson 3-5)

- If two lines in a plane are cut by a transversal so that any of the following is true, then the two lines are parallel: a pair of alternate exterior angles is congruent, a pair of consecutive interior angles is supplementary, or a pair of alternate interior angles is congruent.
- In a plane, if two lines are perpendicular to the same line, then they are parallel.

Distance (Lesson 3-6)

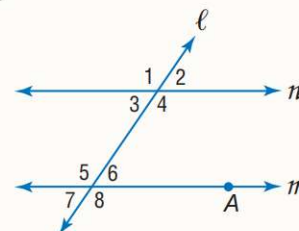
- The distance from a line to a point not on the line is the length of the segment perpendicular to the line from the point.
- The distance between two parallel lines is the distance between one of the lines and any point on the other line.

Key Vocabulary

alternate exterior angles (p. 144)	parallel lines (p. 142)
alternate interior angles (p. 144)	parallel planes (p. 142)
consecutive interior angles (p. 144)	point-slope form (p. 166)
corresponding angles (p. 144)	rate of change (p. 157)
equidistant (p. 183)	slope (p. 156)
	slope-intercept form (p. 165)
	transversal (p. 143)

Vocabulary Check

Refer to the figure and choose the term that best completes each sentence.



1. Angles 4 and 5 are (consecutive, alternate) interior angles.
2. The distance from point A to line n is the length of the segment (perpendicular, parallel) to line n through A .
3. If $\angle 4$ and $\angle 6$ are supplementary, lines m and n are said to be (parallel, intersecting) lines.
4. Line ℓ is a (slope-intercept, transversal) for lines n and m .
5. $\angle 1$ and $\angle 8$ are (alternate interior, alternate exterior) angles.
6. If $n \parallel m$, $\angle 6$ and $\angle 3$ are (supplementary, congruent).
7. Angles 5 and 3 are (consecutive, alternate) interior angles.
8. If $\angle 2 \cong \angle 7$, then lines n and m are (skew, parallel) lines.

Lesson-by-Lesson Review

3-1 Parallel Lines and Transversals (pp. 142–147)

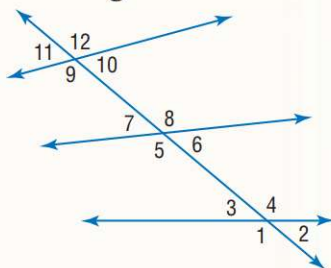
Identify each pair of angles as *alternate interior*, *alternate exterior*, *corresponding*, or *consecutive interior* angles.

9. $\angle 3$ and $\angle 6$

10. $\angle 5$ and $\angle 3$

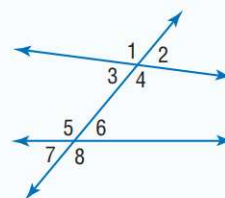
11. $\angle 2$ and $\angle 7$

12. $\angle 4$ and $\angle 8$



13. **EAGLES** The flight paths of two American bald eagles were tracked at an altitude of 8500 feet in a direction north to south and an altitude of 12,000 feet in a direction west to east, respectively. Describe the types of lines formed by the paths of these two eagles. Explain your reasoning.

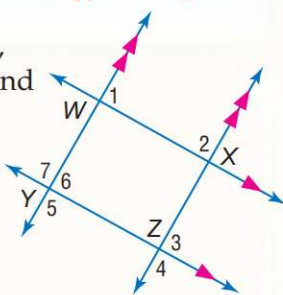
Example 1 Identify each pair of angles as *alternate interior*, *alternate exterior*, *corresponding*, or *consecutive interior* angles.



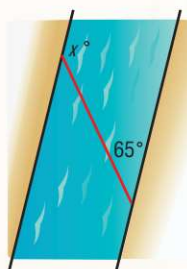
- a. $\angle 7$ and $\angle 3$ corresponding
- b. $\angle 4$ and $\angle 6$ consecutive interior
- c. $\angle 7$ and $\angle 2$ alternate exterior
- d. $\angle 3$ and $\angle 6$ alternate interior

3-2 Angles and Parallel Lines (pp. 149–154)

14. If $m\angle 1 = 3a + 40$, $m\angle 2 = 2a + 25$, and $m\angle 3 = 5b - 26$, find a and b .

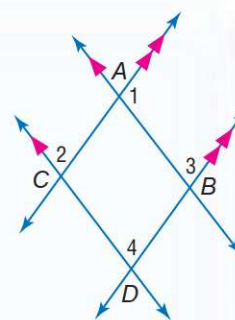


15. **BOATING** To cross the river safely, Georgia angles her canoe 65° from the river's edge, as shown. At what angle x will she arrive on the other side of the river?

**Example 2**

If $m\angle 1 = 4p + 15$, and $m\angle 3 = 3p - 10$, find p .

Since $\overleftrightarrow{AC} \parallel \overleftrightarrow{BD}$, $\angle 1$ and $\angle 3$ are supplementary by the Consecutive Interior Angles Theorem.



$$\begin{aligned}
 m\angle 1 + m\angle 3 &= 180 && \text{Def. of suppl. } \angle \\
 (4p + 15) + (3p - 10) &= 180 && \text{Substitution} \\
 7p + 5 &= 180 && \text{Simplify.} \\
 7p &= 175 && \text{Subtract.} \\
 p &= 25 && \text{Divide.}
 \end{aligned}$$