

LESSON
3.1**Study Guide**

For use with pages 146–152

GOAL Identify angle pairs formed by three intersecting lines.**Vocabulary**

Two lines are **parallel lines** if they do not intersect and are coplanar.

Two lines are **skew lines** if they do not intersect and are not coplanar.

Two planes that do not intersect are **parallel planes**.

A **transversal** is a line that intersects two or more coplanar lines at different points.

When two lines are cut by a transversal, two angles are **corresponding angles** if they have corresponding positions.

When two lines are cut by a transversal, two angles are **alternate interior angles** if they lie between the two lines and on opposite sides of the transversal.

When two lines are cut by a transversal, two angles are **alternate exterior angles** if they lie outside the two lines and on opposite sides of the transversal.

When two lines are cut by a transversal, two angles are **consecutive interior angles** if they lie between the two lines and on the same side of the transversal.

Postulate 13 Parallel Postulate: If there is a line and a point not on the line, then there is exactly one line through the point parallel to the given line.

Postulate 14 Perpendicular Postulate: If there is a line and a point not on the line, then there is exactly one line through the point perpendicular to the given line.

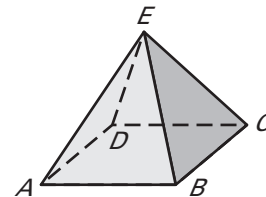
EXAMPLE 1 Identify relationships in space

Think of each segment in the diagram as part of a line. Which line(s) in the diagram appear to fit the description?

- Parallel to \overleftrightarrow{AB}
- Skew to \overleftrightarrow{AB}
- Parallel to \overleftrightarrow{BC}

Solution

- Only \overleftrightarrow{CD} is parallel to \overleftrightarrow{AB} .
- \overleftrightarrow{ED} and \overleftrightarrow{EC} are skew to \overleftrightarrow{AB} .
- Only \overleftrightarrow{AD} is parallel to \overleftrightarrow{BC} .

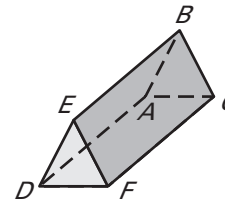


LESSON
3.1
Study Guide *continued*
 For use with pages 146–152

Exercises for Example 1

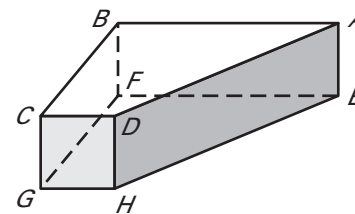
Think of each segment in the diagram as part of a line. Fill in the blank with *parallel*, *skew*, or *perpendicular*.

- \overleftrightarrow{DE} and \overleftrightarrow{CF} are ?.
- \overleftrightarrow{AD} , \overleftrightarrow{BE} , and \overleftrightarrow{CF} are ?.
- Plane ABC and plane DEF are ?.
- \overleftrightarrow{BE} and \overleftrightarrow{AB} are ?.



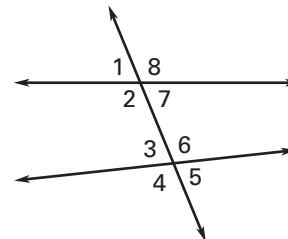
Think of each segment in the diagram as part of a line. There may be more than one right answer.

- Name a line perpendicular to \overleftrightarrow{HD} .
- Name a plane parallel to plane DCH .
- Name a line parallel to \overleftrightarrow{BC} .
- Name a line skew to \overleftrightarrow{FG} .


EXAMPLE 2 Identify angle relationships

Identify all pairs of angles of the given type.

- Corresponding
- Alternate interior
- Alternate exterior
- Consecutive interior



Solution

- | | | | |
|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|
| a. $\angle 1$ and $\angle 3$ | b. $\angle 2$ and $\angle 6$ | c. $\angle 1$ and $\angle 5$ | d. $\angle 2$ and $\angle 3$ |
| $\angle 2$ and $\angle 4$ | $\angle 7$ and $\angle 3$ | $\angle 8$ and $\angle 4$ | $\angle 7$ and $\angle 6$ |
| $\angle 8$ and $\angle 6$ | | | |
| $\angle 7$ and $\angle 5$ | | | |

Exercises for Example 2

Complete the statement with *corresponding*, *alternate interior*, *alternate exterior*, or *consecutive interior*.

- $\angle 3$ and $\angle 5$ are ? angles.
- $\angle 2$ and $\angle 6$ are ? angles.
- $\angle 1$ and $\angle 7$ are ? angles.
- $\angle 4$ and $\angle 5$ are ? angles.

