3-1 Lines and Angles

Vocabulary

● Review

Write T for *true* or F for *false*.

_____ **1.** You can name a *plane* by a capital letter, such as *A*.

_____ **2.** A *plane* contains a finite number of lines.

_____ **3.** Two points lying on the same *plane* are coplanar.

_____ **4.** If two distinct *planes* intersect, then they intersect in exactly one line.

● Vocabulary Builder

parallel (noun) PA **ruh lel**

The symbol for **parallel** is ∥.

Definition: *Parallel* lines lie in the same plane but never intersect, no matter how far they extend.

● Use Your Vocabulary

5. Circle the segment(s) that are *parallel* to the *x*-axis.
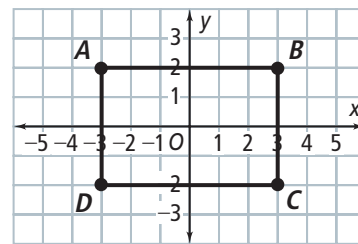
$\overline{AB}$ $\overline{BC}$ $\overline{CD}$ $\overline{AD}$

6. Circle the segment(s) that are *parallel* to the *y*-axis.

$\overline{AB}$ $\overline{BC}$ $\overline{CD}$ $\overline{AD}$

7. Circle the polygon(s) that have two pairs of *parallel* sides.

rectangle   parallelogram   square   trapezoid

Complete each statement below with *line* or *segment*.

8. A __?__ consist of two endpoints and all the points between them.

_____

9. A __?__ is made up of an infinite number of points.

_____

Key Concept Parallel and Skew

Parallel lines are coplanar lines that do not intersect.

Skew lines are noncoplanar; they are not parallel and do not intersect.

Parallel planes are planes that do not intersect.

10. Write each word, phrase, or symbol in the correct oval.
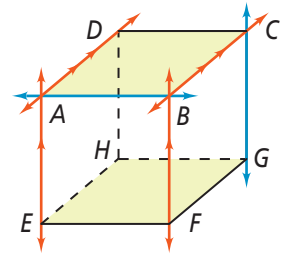
noncoplanar   coplanar   do not intersect

     intersect $\overleftrightarrow{AE}$ and $\overleftrightarrow{CG}$ $\overleftrightarrow{CB}$ and $\overleftrightarrow{AE}$

Use arrows to show
$\overleftrightarrow{AE} \parallel \overleftrightarrow{BF}$ and $\overleftrightarrow{AD} \parallel \overleftrightarrow{BC}$.
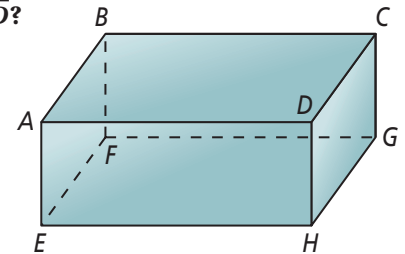
Parallel

Skew

Problem 1 Identifying Nonintersecting Lines and Planes

Got It? Use the figure at the right. Which segments are parallel to $\overline{AD}$?

11. In plane *ADHE*, ____ is parallel to $\overline{AD}$.

12. In plane *ADBC*, ____ is parallel to $\overline{AD}$.

13. In plane *ADGF*, ____ is parallel to $\overline{AD}$.

Got It? **Reasoning** Explain why $\overline{FE}$ and $\overline{CD}$ are *not* skew.

14. Cross out the words or phrases below that do NOT describe skew lines.

coplanar   do not intersect   intersect

    parallel   noncoplanar   not parallel

15. Circle the correct statement below.

Segments and rays can be skew if they lie in skew lines.

Segments and rays are never skew.

16. Underline the correct words to complete the sentence.

$\overline{FE}$ and $\overline{CD}$ are in a plane that slopes from the bottom / top left edge to the

bottom / top right edge of the figure.

17. Why are $\overline{FE}$ and $\overline{CD}$ NOT skew?

_____

_____

Lesson 3-1

take note

Key Concept   Angle Pairs Formed by Transversals

Alternate interior angles are nonadjacent interior angles that lie on opposite sides of the transversal.

Same-side interior angles are interior angles that lie on the same side of the transversal.

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

Alternate exterior angles are nonadjacent exterior angles that lie on opposite sides of the transversal.
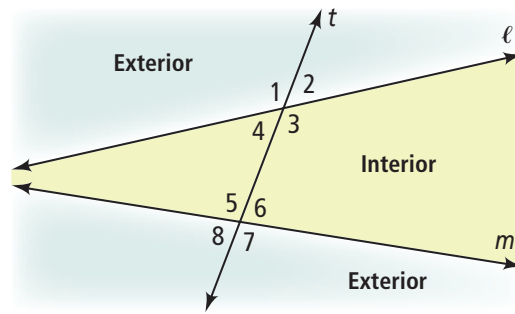
Use the diagram above. Draw a line from each angle pair in Column A to its description in Column B.

Column A	Column B
18. ∠4 and ∠6	alternate exterior angles
19. ∠3 and ∠6	same-side interior angles
20. ∠2 and ∠6	alternate interior angles
21. ∠2 and ∠8	corresponding angles

✅ **Problem 2** **Identifying an Angle Pair**

Got It? **What are three pairs of corresponding angles in the diagram at the right?**

Underline the correct word(s) or letter(s) to complete each sentence.
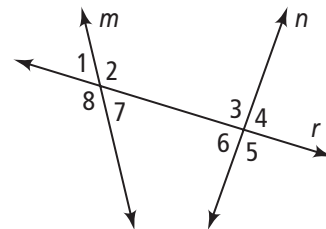
22. The transversal is line *m* / *n* / *r* .

23. Corresponding angles are on the same side / different sides of the transversal.

24. Name three pairs of corresponding angles.

∠☐ and ∠☐   ∠☐ and ∠☐   ∠☐ and ∠☐   ∠☐ and ∠☐

✅ **Problem 3** **Classifying an Angle Pair**

Got It? **Are angles 1 and 3 *alternate interior angles, same-side interior angles, corresponding angles,* or *alternate exterior angles*?**

25. Are ∠1 and ∠3 on the same side of the transversal?   Yes / No

26. Cross out the angle types that do NOT describe ∠1 and ∠3.

alternate exterior   alternate interior   corresponding   same-side interior

27. ∠1 and ∠3 are _?_ angles.
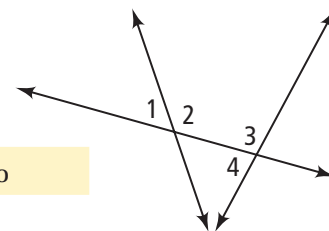
Lesson Check • Do you know HOW?

Name one pair each of the segments or planes.
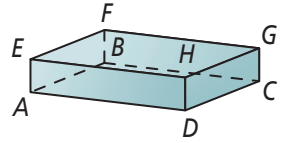
28. parallel segments

$\overline{AB} \parallel$ ▢

29. skew segments

$\overline{HD}$ and ▢

30. parallel planes

$ABCD \parallel$ ▢

Name one pair each of the angles.

31. alternate interior

$\angle 8$ and $\angle$ ▢
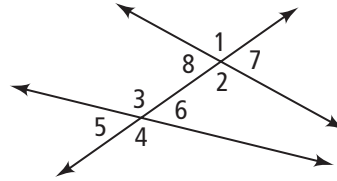
32. same-side interior

$\angle 8$ and $\angle$ ▢

33. corresponding

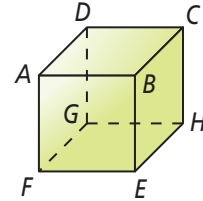$\angle 1$ and $\angle$ ▢

34. alternate exterior

$\angle 7$ and $\angle$ ▢

Lesson Check • Do you UNDERSTAND?

Error Analysis Carly and Juan examine the figure at the right. Carly says $\overline{AB} \parallel \overline{HG}$. Juan says $\overline{AB}$ and $\overline{HG}$ are skew. Who is correct? Explain.

Write T for *true* or F for *false*.

▢ **35.** Parallel segments are coplanar.

▢ **36.** There are only six planes in a cube.

▢ **37.** No plane contains $\overline{AB}$ and $\overline{HG}$.

38. Who is correct? Explain.

_____

_____

Math Success

Check off the vocabulary words that you understand.

☐ angle   ☐ parallel   ☐ skew   ☐ transversal

Rate how well you can *classify angle pairs*.

Need to review   0   2   4   6   8   10   Now I get it!