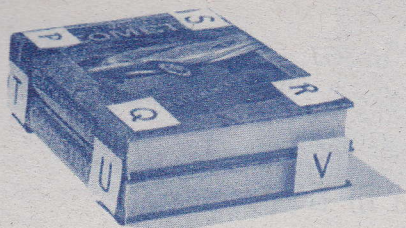


## WORK TOGETHER

Work in pairs to answer these questions about the lines and planes determined by the surfaces of a rectangular solid.

Stack your geometry books to form a rectangular solid. Label the vertices  $P, Q, R, S, T, U, V,$  and  $W$ . Identify each of the following.

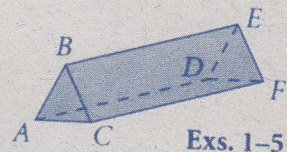
10. three pairs of parallel planes
11. all lines that are parallel to  $\overline{PQ}$
12. all lines that are skew to  $\overline{PQ}$



## Exercises ON YOUR OWN

Name all the segments that are parallel to the given segment.

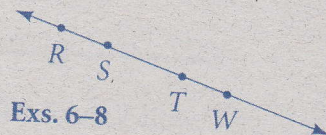
1.  $\overline{AC}$
2.  $\overline{EF}$
3.  $\overline{AD}$



4. Name all the lines that form a pair of skew lines with  $\overline{AD}$ .

5. Name a pair of parallel planes.

Use the line at the right for Exercises 6-8.



6. a. Name a pair of opposite rays with point  $T$  as endpoint.  
b. Name another pair of opposite rays.

7. Name all the segments shown.

8. Name  $\overline{RT}$  two other ways.

Make a separate sketch for each of the following.

9. Draw three parallel lines  $a, t,$  and  $q$ .
10. Draw parallel planes  $A$  and  $B$ .
11. Draw  $\overline{AB}, \overline{CD},$  and  $\overline{EF}$  so that  $\overline{AB} \parallel \overline{CD}, \overline{AB}$  and  $\overline{EF}$  are skew, and  $\overline{CD}$  and  $\overline{EF}$  are skew.
12. Draw planes  $C$  and  $D,$  intersecting in  $\overline{XY}$ .



Write *true* or *false*.

13.  $\overline{CB} \parallel \overline{GF}$

14.  $\overline{ED} \parallel \overline{HG}$

15. plane  $AED \parallel$  plane  $FGH$

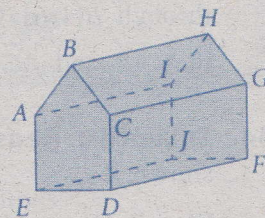
16. plane  $ABH \parallel$  plane  $CDF$

17.  $\overline{AB}$  and  $\overline{HG}$  are skew lines.

18.  $\overline{AE}$  and  $\overline{BC}$  are skew lines.

19.  $\overline{CF}$  and  $\overline{AI}$  are skew lines.

20.  $\overline{CF}$  and  $\overline{AJ}$  are skew lines.



Complete with *always*, *sometimes*, or *never* to make a true statement.

21.  $\overline{AB}$  and  $\overline{BA}$  are \_\_\_\_\_ the same ray.

22.  $\overline{AB}$  and  $\overline{AC}$  are \_\_\_\_\_ the same ray.

23.  $\overline{AX}$  and  $\overline{XA}$  are \_\_\_\_\_ the same segment.

24.  $\overline{TQ}$  and  $\overline{QT}$  are \_\_\_\_\_ the same line.

25. Two parallel lines are \_\_\_\_\_ coplanar.

26. Skew lines are \_\_\_\_\_ coplanar.

27. Opposite rays \_\_\_\_\_ form a line.

28. Two lines in the same plane are \_\_\_\_\_ parallel.

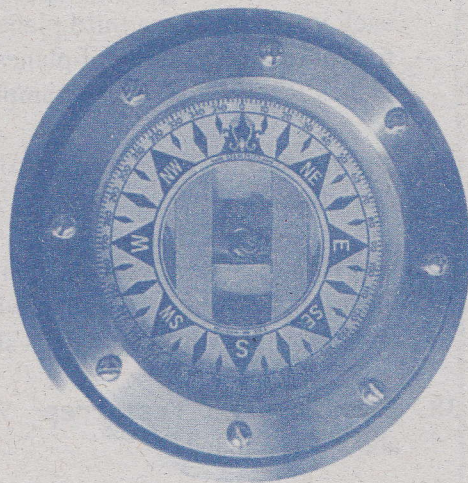
29. Two planes that do not intersect are \_\_\_\_\_ parallel.

30. Two lines that lie in parallel planes are \_\_\_\_\_ parallel.

31. **Writing Summarize** the different ways that two lines may be related. Give examples from the real world that illustrate the relationships.

32. **Navigation** North and south are directions on a compass that are on opposite rays. Name two other pairs of compass directions that are opposite rays.

Directions are printed on a compass card, a circle divided into 32 equally-spaced compass points.





33. **Coordinate Geometry**  $\overline{AB}$  has endpoint  $A(2, 3)$  and goes through  $B(4, 6)$ . Give some possible coordinates for point  $C$  so that  $\overline{AB}$  and  $\overline{AC}$  will be opposite rays. Graph your answer.

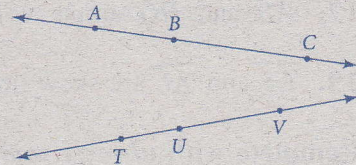
34. **Inductive Reasoning** Draw a diagram similar to the one shown.

**Step 1:** Draw  $\overline{AU}$  and  $\overline{BT}$ . Label their intersection point as  $X$ .

**Step 2:** Draw  $\overline{AV}$  and  $\overline{CT}$ . Label their intersection point as  $Y$ .

**Step 3:** Draw  $\overline{BV}$  and  $\overline{CU}$ . Label their intersection point as  $Z$ .

Make a **conjecture** about points  $X$ ,  $Y$ , and  $Z$ .



35. **Critical Thinking** Suppose two parallel planes  $A$  and  $B$  are each intersected by a third plane  $C$ . What do you think will be true of the intersection of planes  $A$  and  $C$  and the intersection of planes  $B$  and  $C$ ? Give an example in your classroom.

36. **Open-ended** List four pairs of parallel planes in your classroom.

37. **Writing** The term skew is from a Middle English word meaning “to escape.” Explain why this might be an appropriate origin for the word that names skew lines.

38. **Standardized Test Prep** Which statement(s) can be true about three planes?

I. They intersect in a line. II. They intersect in a point III. They have no points in common.

A. I only      B. II only      C. I and II only      D. I and III only      E. I, II and III

**Chapter Project**

**Find Out by Researching**

- Find a book that contains directions for making origami creations, and follow the directions to make your chosen origami figure.