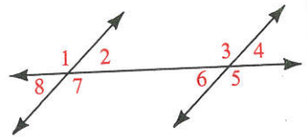
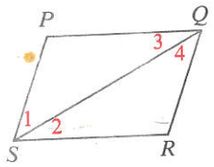
Written Exercises

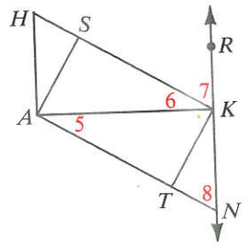
Classify each pair of angles as alternate interior angles, same-side interior angles, or corresponding angles.



A
1. $\angle 2$ and $\angle 6$
2. $\angle 8$ and $\angle 6$
3. $\angle 2$ and $\angle 3$
4. $\angle 3$ and $\angle 7$
5. $\angle 5$ and $\angle 7$
6. $\angle 3$ and $\angle 1$

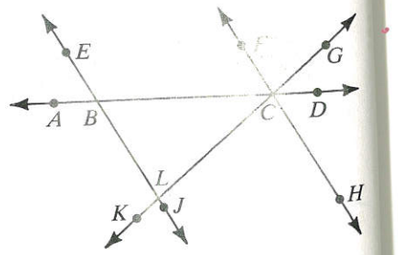
Name the two lines and the transversal that form each pair of angles.





7. $\angle 2$ and $\angle 3$
8. $\angle 1$ and $\angle 4$
9. $\angle P$ and $\angle PSR$
10. $\angle 5$ and $\angle 6$
11. $\angle 7$ and $\angle 8$
12. $\angle 8$ and $\angle HAN$

Classify each pair of angles as alternate interior, same-side interior, or corresponding angles.

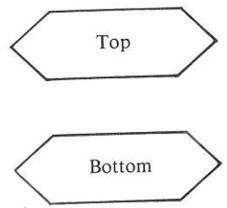


13. $\angle EBA$ and $\angle FCB$
14. $\angle DCH$ and $\angle CBJ$
15. $\angle FCB$ and $\angle CBL$
16. $\angle FCL$ and $\angle BLC$
17. $\angle HCB$ and $\angle CBJ$
18. $\angle GCH$ and $\angle GLJ$
19. Make a drawing that shows two coplanar segments that do not intersect and yet are not parallel.

In Exercises 20–22, use two lines of notebook paper for parallel lines and draw any transversal. Use a protractor to measure.

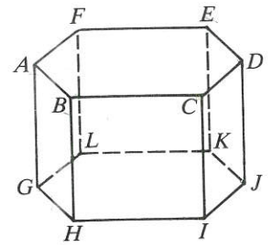
20. Measure one pair of corresponding angles. Repeat the experiment with another transversal. What appears to be true?
21. Measure one pair of alternate interior angles. Repeat the experiment with another transversal. What appears to be true?
22. Measure one pair of same-side interior angles. Repeat the experiment with another transversal. What appears to be true?

B 23. Draw a diagram of a six-sided box by following the steps below.



Step 1

Draw a six-sided top. Then draw an exact copy of the top directly below it.



Step 2

Draw vertical edges. Make invisible edges dashed.

Exercises 24–30 refer to the diagram in Step 2 of Exercise 23.

24. Name five lines that appear to be parallel to $\overline{AG}$.
25. Name three lines that appear to be parallel to $\overline{AB}$.
26. Name four lines that appear to be skew to $\overline{AB}$.
27. Name two planes parallel to $\overleftrightarrow{AF}$.
28. Name four planes parallel to $\overleftrightarrow{FL}$.
29. How many pairs of parallel planes are shown?
30. Suppose the top and bottom of the box lie in parallel planes. Explain how Theorem 2–1 can be used to prove $\overline{CD} \parallel \overline{IJ}$.

Complete each statement with the word *always*, *sometimes*, or *never*.

31. When there is a transversal of two lines, the three lines are ? coplanar.
32. Two lines that are not coplanar ? intersect.
33. Two lines skew to a third line are ? skew to each other.
34. Two lines perpendicular to a third line are ? perpendicular to each other.
35. Two planes parallel to the same line are ? parallel to each other.
36. Two planes parallel to the same plane are ? parallel to each other.
37. If a line is parallel to a plane, a plane containing that line is ? parallel to the given plane.
38. Two lines parallel to the same plane are ? parallel to each other.

Draw the figures described.

C 39. Lines a and b are skew, lines b and c are skew, and $a \parallel c$.
40. Lines d and e are skew, lines e and f are skew, and $d \perp f$.
41. Line $l \parallel$ plane X, plane $X \parallel$ plane Y, and l is not parallel to Y.