

Section 3.1 Lines and Angles

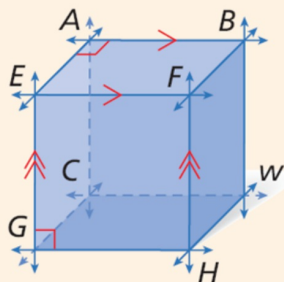
Parallel, Perpendicular, and Skew Lines

Parallel lines (\parallel) are coplanar and do not intersect. In the figure, $\overleftrightarrow{AB} \parallel \overleftrightarrow{EF}$, and $\overleftrightarrow{EG} \parallel \overleftrightarrow{FH}$.

Perpendicular lines (\perp) intersect at 90° angles. In the figure, $\overleftrightarrow{AB} \perp \overleftrightarrow{AE}$, and $\overleftrightarrow{EG} \perp \overleftrightarrow{GH}$.

Skew lines are not coplanar. Skew lines are not parallel and do not intersect. In the figure, \overleftrightarrow{AB} and \overleftrightarrow{EG} are skew.

Parallel planes are planes that do not intersect. In the figure, plane $ABE \parallel$ plane CDG .



Arrows are used to show that $\overleftrightarrow{AB} \parallel \overleftrightarrow{EF}$ and $\overleftrightarrow{EG} \parallel \overleftrightarrow{FH}$.

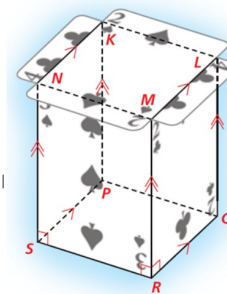
Identify each of the following.

A. a pair of parallel segments

B. a pair of skew segments

C. a pair of perpendicular segments

D. a pair of parallel planes



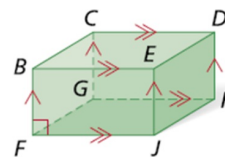
Identify each of the following.

a. a pair of parallel segments

b. a pair of skew segments

c. a pair of perpendicular segments

d. a pair of parallel planes



Angle Pairs Formed by a Transversal

TERM	EXAMPLE
Transversal is a line that intersects two coplanar lines at two different points. The transversal t and the other two lines r and s form eight angles.	
Corresponding angles lie on the same side of the transversal t , on the same sides of lines r and s .	$\angle 1$ and $\angle 5$
Alternate interior angles are nonadjacent angles that lie on opposite sides of the transversal t , between lines r and s .	$\angle 3$ and $\angle 6$
Vertical angles lie on opposite sides of the transversal t , outside lines r and s .	$\angle 1$ and $\angle 8$
Consecutive interior angles or <i>consecutive interior angles</i> lie on the same side of the transversal t , between lines r and s .	$\angle 3$ and $\angle 5$

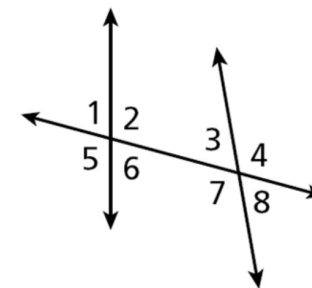
Give an example of each angle pair.

A. corresponding angles

B. alternate interior angles

C. alternate exterior angles

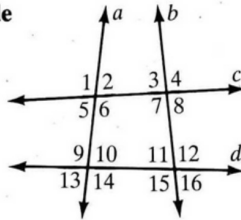
D. same-side interior angles



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

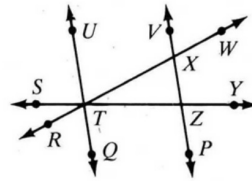
11. $\angle 2$ and $\angle 4$
 12. $\angle 10$ and $\angle 11$
 13. $\angle 14$ and $\angle 15$

14. $\angle 7$ and $\angle 12$
 15. $\angle 5$ and $\angle 10$
 16. $\angle 3$ and $\angle 11$



17. $\angle STU$ and $\angle SZX$
 19. $\angle UTZ$ and $\angle VZY$
 21. $\angle QTZ$ and $\angle VZT$
 23. $\angle WXZ$ and $\angle YZP$

18. $\angle WXZ$ and $\angle YZX$
 20. $\angle VXT$ and $\angle UTX$
 22. $\angle VXT$ and $\angle XTQ$
 24. $\angle QTZ$ and $\angle PZT$



Helpful Hint

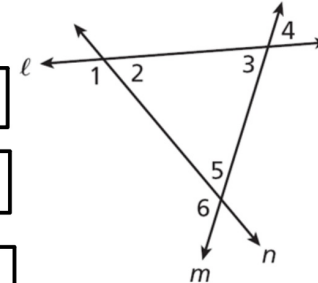
To determine which line is the transversal for a given angle pair, locate the line that connects the vertices.

Identify the transversal and classify each angle pair.

- A. $\angle 1$ and $\angle 3$

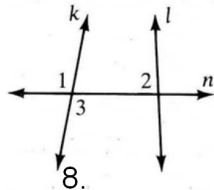
- B. $\angle 2$ and $\angle 6$

- C. $\angle 4$ and $\angle 6$

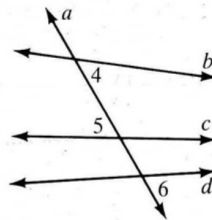


Name the two lines and the transversal that form each pair of angles.

7. $\angle 1$ and $\angle 2$
 $\angle 2$ and $\angle 3$



8. $\angle 4$ and $\angle 5$
 $\angle 4$ and $\angle 6$



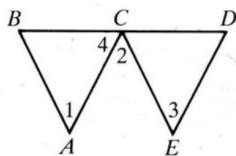
lines

lines

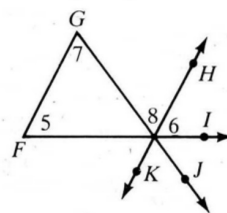
transversal

transversal

9. $\angle 1$ and $\angle 2$
 $\angle 2$ and $\angle 3$



10. $\angle 5$ and $\angle 6$
 $\angle 7$ and $\angle 8$



lines

lines

transversal

transversal

Lesson Quiz: Part I

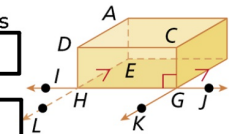
Identify each of the following.

1. a pair of parallel segments

2. a pair of skew segments

3. a pair of perpendicular segments

4. a pair of parallel planes



Lesson Quiz: Part II

Identify each of the following.

5. one pair alternate interior angles

6. One pair corresponding angles

7. one pair alternate exterior angles

8. one pair same-side interior angles

