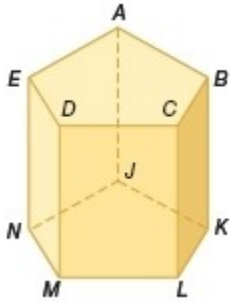


3-1 Parallel Lines and Transversals

Refer to the figure to identify each of the following.



13. all segments parallel to \overline{DM}

SOLUTION:

Parallel segments are coplanar segments that do not intersect. Segments that are parallel to \overline{DM} are \overline{CL} , \overline{EN} , \overline{BK} , \overline{AJ} .

ANSWER:

\overline{CL} , \overline{EN} , \overline{BK} , \overline{AJ}

18. a segment parallel to \overline{EN}

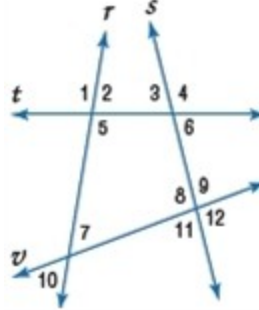
SOLUTION:

Parallel segments are coplanar segments that do not intersect. Segments parallel to \overline{EN} are \overline{AJ} , \overline{BK} , \overline{CL} , or \overline{DM} .

ANSWER:

\overline{AJ} , \overline{BK} , \overline{CL} , or \overline{DM}

APPLY MATH Identify the transversal connecting each pair of angles. Then classify the relationship between each pair of angles as *alternate interior*, *alternate exterior*, *corresponding*, or *consecutive interior angles*.



22. $\angle 5$ and $\angle 7$

SOLUTION:

The transversal connecting $\angle 5$ and $\angle 7$ is line r . Interior angles that lie on the same side of the transversal are consecutive interior angles.

ANSWER:

line r ; consecutive interior

24. $\angle 10$ and $\angle 11$

SOLUTION:

The transversal connecting $\angle 10$ and $\angle 11$ is line v . One interior ($\angle 11$) and one exterior ($\angle 10$) (non adjacent) angles that lie on the same side of the transversal are corresponding angles.

ANSWER:

line v ; corresponding

28. $\angle 9$ and $\angle 10$

SOLUTION:

The transversal connecting $\angle 9$ and $\angle 10$ is line v . Exterior angles that are non adjacent and lie on opposite sides of the transversal are alternate exterior angles.

ANSWER:

line v ; alternate exterior

3-1 Parallel Lines and Transversals

30. $\angle 7$ and $\angle 11$

SOLUTION:

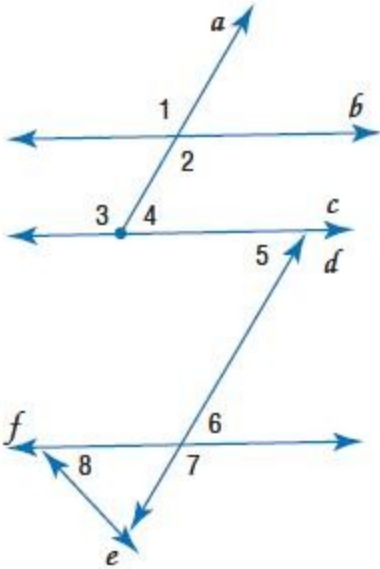
The transversal connecting $\angle 7$ and $\angle 11$ is line v . Interior angles that are non adjacent and lie on opposite sides of the transversal are alternate interior angles.

ANSWER:

line v ; alternate interior

SAFETY Identify the transversal connecting each pair of angles in the photo of a fire escape shown. Then classify the relationship between each pair of angles.

Refer to Page 176.



32. $\angle 2$ and $\angle 4$

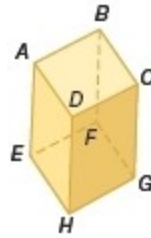
SOLUTION:

The transversal connecting $\angle 2$ and $\angle 4$ is line a . Interior angles that lie on the same side of the transversal are consecutive interior angles.

ANSWER:

line a ; consecutive interior

Describe the relationship between each pair of segments as *parallel*, *skew*, or *intersecting*.



43. \overline{CD} and \overline{AD}

SOLUTION:

\overline{CD} and \overline{AD} are line that intersect. Therefore they are intersecting lines.

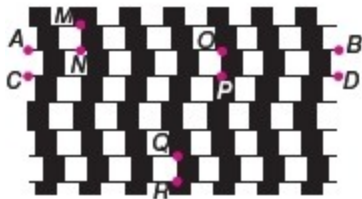
ANSWER:

intersecting

3-1 Parallel Lines and Transversals

44. **ORGANIZE IDEAS** The illusion shown is created using squares and straight lines.

- How are \overline{AB} and \overline{CD} related? Justify your reasoning.
- How are \overline{MN} and \overline{QR} related? \overline{AB} , \overline{CD} , and \overline{OP} ?



SOLUTION:

a. The distance between the segments is the same anywhere on the segment. The segments also are joined by sides of the squares. Since the consecutive sides of a square are perpendicular, the segments are perpendicular to the same line. Lines that are perpendicular to the same line are parallel.

Therefore, $\overline{AB} \parallel \overline{CD}$.

b. Each pair of consecutive segments going from left to right is joined by the side of square. Since the sides of the square are perpendicular, each pair of consecutive segments is parallel. Lines that are parallel to the same line are parallel, so all the segments going from left to right are parallel.

Therefore, $\overline{MN} \parallel \overline{QR}$.

Since \overline{OP} crosses \overline{AB} and \overline{CD} at points O and P , \overline{OP} is a transversal between \overline{AB} and \overline{CD} .

ANSWER:

a. $\overline{AB} \parallel \overline{CD}$; The distance between the segments is the same anywhere on the segment.

b. $\overline{MN} \parallel \overline{QR}$; \overline{OP} is a transversal between \overline{AB} and \overline{CD} .