3-1 Study Guide and Intervention
Parallel Lines and Transversals

Relationships Between Lines and Planes
When two lines lie in the same plane and do not intersect, they are parallel. Lines that do not intersect and are not coplanar are skew lines. In the figure, \( \ell \) is parallel to \( m \), or \( \ell \parallel m \). You can also write \( PQ \parallel RS \). Similarly, if two planes do not intersect, they are parallel planes.

Example

a. Name all planes that are parallel to plane \( ABD \).
   - Plane \( EFH \)

b. Name all segments that are parallel to \( CG \).
   - \( BF, DH \), and \( AE \)

c. Name all segments that are skew to \( EH \).
   - \( BF, CG, BD, CD \), and \( AB \)

Exercises

For Exercises 1–3, refer to the figure at the right.

1. Name all planes that intersect plane \( OPT \).

2. Name all segments that are parallel to \( NU \).

3. Name all segments that intersect \( MP \).

For Exercises 4–7, refer to the figure at the right.

4. Name all segments parallel to \( QX \).

5. Name all planes that intersect plane \( MHE \).

6. Name all segments parallel to \( QR \).

7. Name all segments skew to \( AG \).
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Study Guide and Intervention
Perpendiculars and Distance

Distance From a Point to a Line  When a point is not on a line, the distance from the point to the line is the length of the segment that contains the point and is perpendicular to the line.

Example  Draw the segment that represents the distance from $E$ to $AF$.
Extend $AF$. Draw $EG \perp AF$.
$EG$ represents the distance from $E$ to $AF$.

Exercises

Draw the segment that represents the distance indicated.

1. $C$ to $AB$

2. $D$ to $AB$

3. $T$ to $RS$

4. $S$ to $PQ$

5. $S$ to $QR$

6. $S$ to $RT$