Warm Up

What geometry term might you associate with each object?

1. one edge of a cardboard box
   line segment or line
2. the floor
   plane or rectangle
3. the tip of a pen
   point
Learn to identify and describe geometric figures.
Vocabulary

point
line
ray
line segment
plane
congruent
A **point** is an exact location in space. It is usually represented as a dot, but it has no size at all.

A **line** is a straight path that extends without end in opposite directions.

**Helpful Hint**
A number line is an example of a line.
A **ray** is a part of a line. It has one endpoint and extends without end in one direction.

A **line segment** is part of a line or a ray that extends from one endpoint to another.
A **plane** is a perfectly flat surface that extends infinitely in all directions.

**Helpful Hint**

A coordinate plane is an example of a plane.
Additional Example 1: Identifying Points, Lines, and Planes

Identify the figures in the diagram.

A. three points
B. two lines
C. a plane

D, E, and F
DE, DF
plane DEF

Choose any two points on a line to name the line. Choose any three points, not on the same line, in any order.
Try This: Example 1

Identify the figures in the diagram.

A. four points
   H, G, I, and F

B. two lines
   \( \overrightarrow{IH}, \overrightarrow{HF} \)

C. a plane
   plane \( IGF \)

Choose any two points on a line to name the line. Choose any three points, not on the same line, in any order.
Additional Example 2: Identifying Line Segments and Rays

Identify the figures in the diagram.

A. three rays \( \overrightarrow{MN}, \overrightarrow{NM}, \overrightarrow{MO} \)

B. two line segments \( \overline{MN}, \overline{MO} \)

Name the endpoint of a ray first.

Use the endpoints in any order to name a segment.
Try This: Example 2

Identify the figures in the diagram.

A. three rays
\[ \overrightarrow{BC}, \overrightarrow{CA}, \overrightarrow{BD} \]  
Name the endpoint of a ray first.

B. three line segments
\[ \overline{BA}, \overline{CA}, \overline{BD} \]  
Use the endpoints in any order to name a segment.
Figures are **congruent** if they have the same shape and size. If you place one on top of the other, they match exactly. Line segments are congruent if they have the same length.

Tick marks are used to indicate congruent line segments. In the illustration below, segments that have the same number of tick marks are congruent. Line segments $AB$ and $BC$ are congruent (one tick mark), and line segments $MN$ and $OP$ are congruent (two tick marks).
Additional Example 3: Identifying Congruent Line Segments

Identify the line segments that are congruent.

\[ \overline{AB} \cong \overline{CD} \quad \text{One tick mark} \]
\[ \overline{AC} \cong \overline{BD} \quad \text{Two tick marks} \]
\[ \overline{BF} \cong \overline{DF} \cong \overline{EC} \cong \overline{AE} \quad \text{Three tick marks} \]

**Reading Math**

The symbol \( \cong \) means “is congruent to.”
Try This: Example 3

Identify the line segments that are congruent.

- $\overline{AB} \cong \overline{AC}$  
  One tick mark

- $\overline{BC} \cong \overline{DE}$  
  Two tick marks

- $\overline{BD} \cong \overline{CE}$  
  Three tick marks
Lesson Quiz

Use geometric notation to identify figures.

1. lines
   \( \overrightarrow{AD}, \overrightarrow{BE}, \overrightarrow{CF} \)

2. plane
   Possible answer: plane \( ABG \)

3. three rays
   Possible answer: \( \overrightarrow{GA}, \overrightarrow{GB}, \overrightarrow{GC} \)

4. four line segments
   Possible answer: \( \overline{AG}, \overline{AD}, \overline{DG}, \overline{BG} \)

5. How many planes, lines, and points are suggested by the sides, edges, and corners of an ordinary box?
   6 planes, 12 lines, 8 points