

# 1.1 Points, Lines and Planes

## Vocabulary

undefined

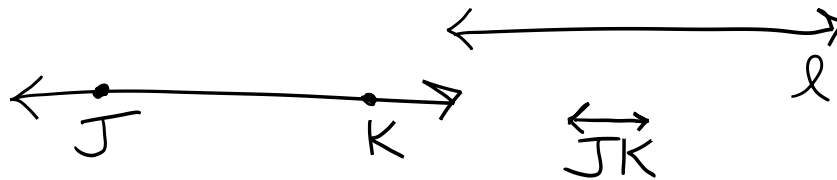
- **Point** is a location in space. A **point** has 0 dimension. A **point** is named by a single capital letter.

Example:



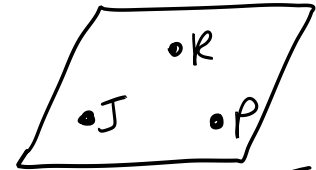
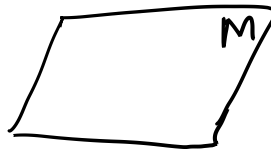
- **Line** consists of an infinite number of points which extends in two directions. A **line** has one dimension. A **line** can be named by a single lower case letter OR by any two points on the line.

Example:



- **Plane** consists of an infinite number of points which form a flat surface (that looks like a wall or floor) that extends in all directions. A **plane** has two dimensions. A **plane** may be named using a single capital letter OR by using three non-collinear points.

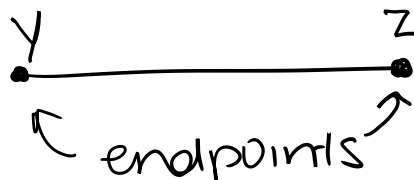
Example:



JRP

- **Line segment** consists of two points on a line called endpoints and all the points on the line between them.

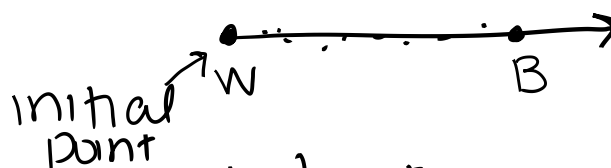
Example:



$\overline{YZ}$  or  $\overline{ZY}$

- **Ray** consists of one point on a line (called the *initial point*) and all the points on the line that extend in one direction.

Example:





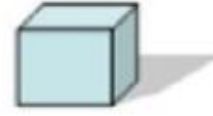
$\overrightarrow{WB}$  or  $\overrightarrow{BW}$

- **Opposite rays** share the same initial point and extend in opposite directions on the same line.

Example:

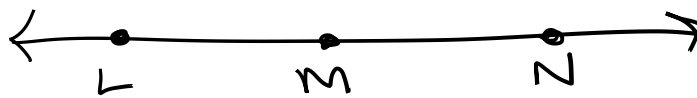


$\overrightarrow{GE}$  and  $\overrightarrow{ED}$  are opposite rays

point	line	Plane	Solid
Zero dimensions	One dimension	Two dimensions	Three dimensions
•			

- **Collinear points** - points that lie on the same line

Example:



L, M + N  
are  
collinear

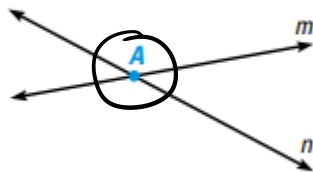
- **Coplanar points** - points that lie on the same plane

Example:

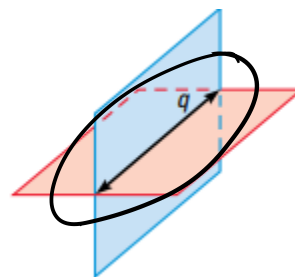


E, F + G are  
coplanar

- ❖ Two or more geometric figures intersect if they have one or more points in common. The intersection of the figures is the set of points the figures have in common.




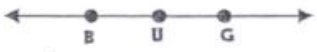

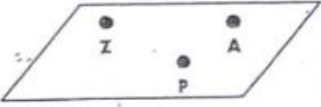


The intersection of two different lines is a point.

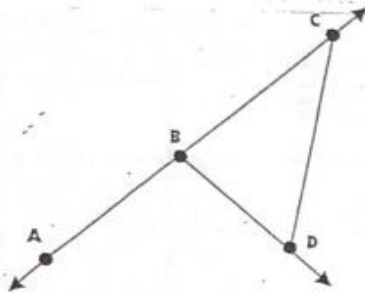


The intersection of two different planes is a line.

Classify and name each of the following objects.

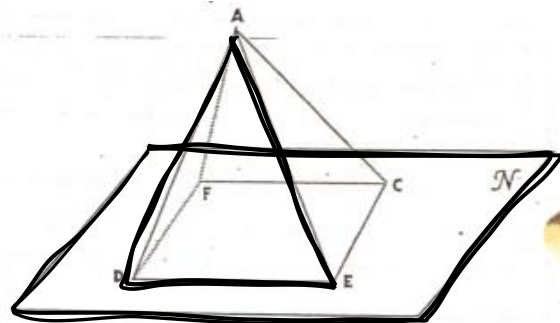
Object	What is it?	Name it geometrically.
	line	Name it <u>TWO</u> ways: $\overleftrightarrow{TX}$ $\overleftrightarrow{XT}$
	point	R
	ray	$\overrightarrow{UP}$
	Which <u>TWO</u> objects are shown? line opposite rays	Name <u>BOTH</u> objects. $\overleftrightarrow{BU}$ $\overleftrightarrow{BG}$ $\overleftrightarrow{UG}$ $\overrightarrow{BU}$ and $\overrightarrow{UG}$
	line segment	Name it <u>TWO</u> ways: $\overline{WE}$ $\overline{EW}$
	plane	Name it <u>TWO</u> ways: ZPA APZ

Use the diagram to name the figures.



- Three non-collinear points  
D, A, C
- Opposite rays  
 $\overrightarrow{AB}$  and  $\overrightarrow{BC}$
- One line segment  
 $\overline{CD}$
- Three collinear points  
A, B, C
- Two rays that are not opposite rays  
 $\overrightarrow{BD}$  and  $\overrightarrow{BC}$

Answer the following about the picture.



- Name all points that are **NOT** collinear to F and C  
D, E, A
- Name all the points that are **NOT** in plane N  
A
- What is the intersection of plane ADE and plane N  
 $\overline{DE}$

**Pair-Share:**

Use the figure for Exercises 1–7.

1. Name a plane. CDE

2. Name a segment.  $\overline{BD}$

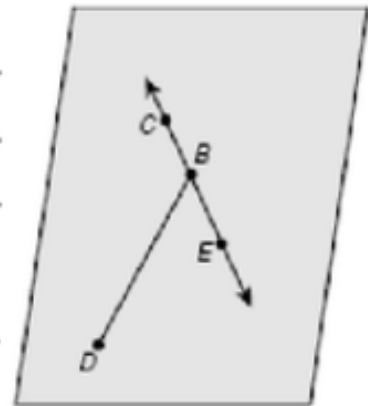
3. Name a line.  $\overleftrightarrow{CE}$

4. Name three collinear points.  
C, B, E

5. Name three noncollinear points.  
C, D, E

6. Name the intersection of a line and a segment not on the line. point B

7. Name a pair of opposite rays.  $\overrightarrow{CB}$  and  $\overrightarrow{BE}$



Use the figure for Exercises 8–11.

8. Name the points that determine plane  $\mathcal{R}$ .  
XYZ

9. Name the point at which line  $m$  intersects plane  $\mathcal{R}$ . Z

10. Name two lines in plane  $\mathcal{R}$  that intersect line  $m$ .  
 $\overleftrightarrow{XZ}$  and  $\overleftrightarrow{YZ}$

