

What You Will Learn

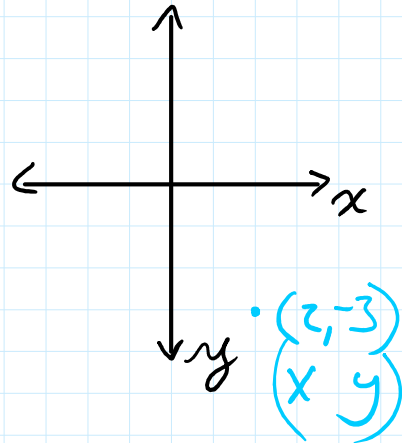
- ▶ Name points, lines, and planes.
 - ▶ Name segments and rays.
 - ▶ Sketch intersections of lines and planes.
 - ▶ Solve real-life problems involving lines and planes.
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What is the basis of all of Cartesian Geometry?

Point

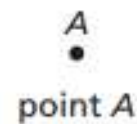
Undefined terms

Point
line
plane



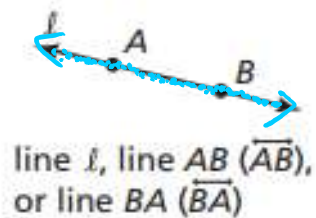
Undefined Terms: Point, Line, and Plane

Point A **point** has no dimension. A dot represents a point.



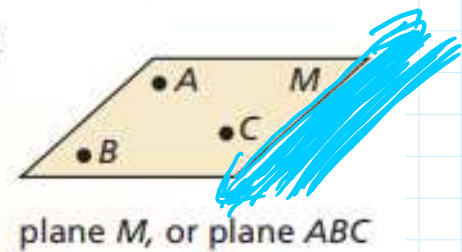
Line A **line** has one dimension. It is represented by a line with two arrowheads, but it extends without end.

Through any two points, there is exactly one line. You can use any two points on a line to name it.



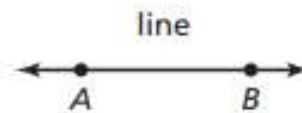
Plane A **plane** has two dimensions. It is represented by a shape that looks like a floor or a wall, but it extends without end.

Through any three points not on the same line, there is exactly one plane. You can use three points that are not all on the same line to name a plane.

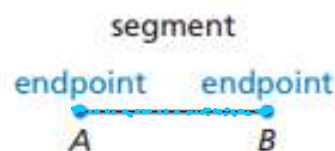


Defined Terms: Segment and Ray

The definitions below use line AB (written as \overleftrightarrow{AB}) and points A and B .

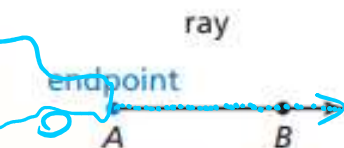


Segment The **line segment** AB , or **segment** AB , (written as \overline{AB}) consists of the **endpoints** A and B and all **points** on \overline{AB} that are between A and B . Note that \overline{AB} can also be named \overline{BA} .



Ray The **ray** AB (written as \overrightarrow{AB}) consists of the endpoint A and all points on \overrightarrow{AB} that lie on the same side of A as B .

Note that \overrightarrow{AB} and \overrightarrow{BA} are different rays.



Opposite Rays If point C lies on \overleftrightarrow{AB} between A and B , then \overrightarrow{CA} and \overrightarrow{CB} are **opposite rays**.



Element

Point

capital letter

Write

A, B

Say

"A" "point A"

Segment

2 cap letters

different points

\overline{AB} \overline{BA}

~~\overline{AP}~~

"segment AB"

Line

✓

2 cap letters

\leftrightarrow_{AB}

\leftrightarrow_{BA}

~~\leftrightarrow_{AP}~~

"line AB"

Ray

✓

2 cap letters

\overrightarrow{AB}

~~\overrightarrow{BA}~~

~~\overrightarrow{AP}~~

"ray AB"

Plane

3 cap letters

non collinear

Plane APQ, APQ

"plane APQ" "plane Z"



Define

Collinear points

points that fall on the same line

Coplanar points

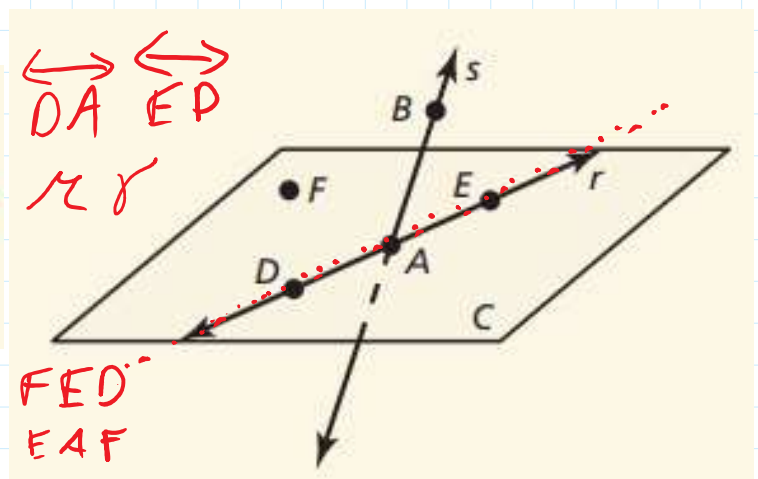
points that fall on the same plane

a. Give two other names for \overleftrightarrow{DE} and plane C.

\leftrightarrow_{DA} \leftrightarrow_{EP}
M, N

b. Name three points that are collinear. Name four points that are coplanar.

E, A, D
F, D, A, E

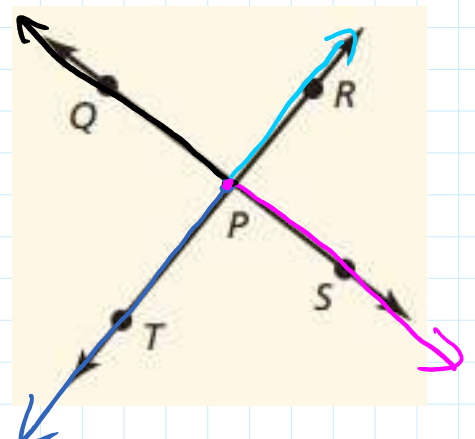


a. Give another name for \overline{TR} .

\overline{RT}

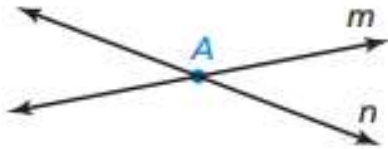
b. Name all rays with endpoint P. Which of these rays are opposite rays?

\overrightarrow{PR} \overrightarrow{PT} \overrightarrow{PQ} \overrightarrow{PS}

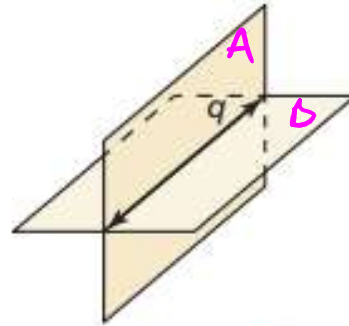


Sketching Intersections

Two or more geometric figures *intersect* when they have one or more points in common. The **intersection** of the figures is the set of points the figures have in common. Some examples of intersections are shown below.

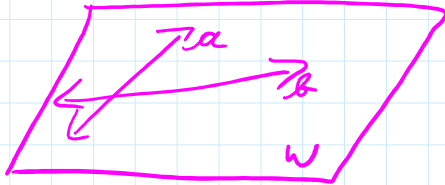


The intersection of two different lines is a point.

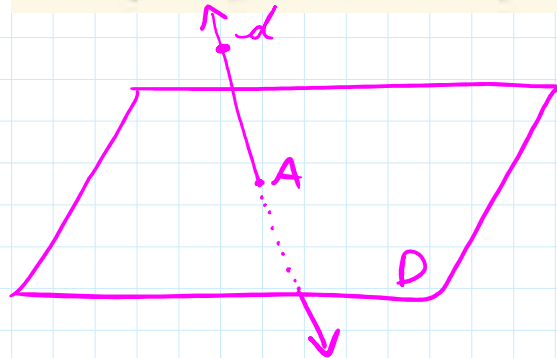


The intersection of two different planes is a line.

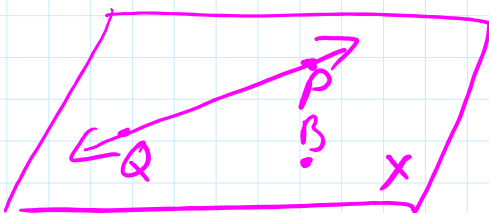
a. Sketch two intersecting lines a and b that lie in plane W .



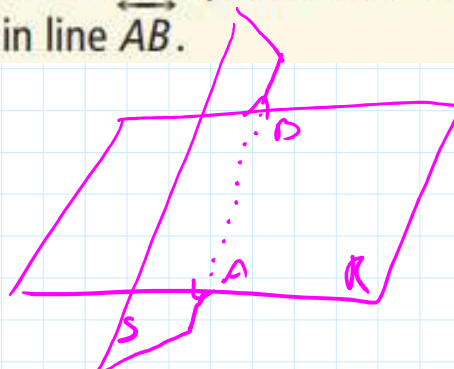
b. Sketch line d that intersects plane D in only one point. Label the point A .



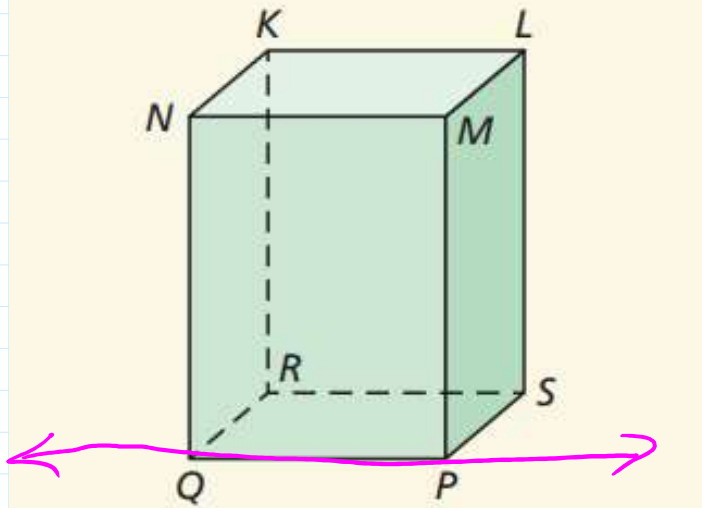
c. Sketch a plane X that contains \overleftrightarrow{PQ} and a point B not on \overleftrightarrow{PQ} .



Sketch two planes R and S that intersect in line \overleftrightarrow{AB} .



The diagram shows a juice box. Name two different planes that contain \overleftrightarrow{QP} .



QNM

Practice sec 1.1
pg. 8: 2, 3-21EO,
27-33EO, 39

