

# 1.1 Identify Points, Lines, and Planes

\*\*Everyday we have notes, get your green vocab sheet out! You can take notes on that, as well as on notebook paper.

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\*undefined terms- the terms *point*, *line*, and *plane*

\*These words do not have a formal definition, but there is agreement about what they mean.

## Point

\*No dimension

\*Represented by a dot.

\*Named by 1 upper case letter.



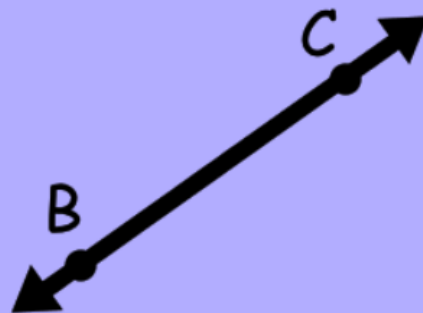
point A

## Line

\*One dimension

\*Represented by a line with two arrowheads, but extends without end.

\*Named by 2 upper case letters.



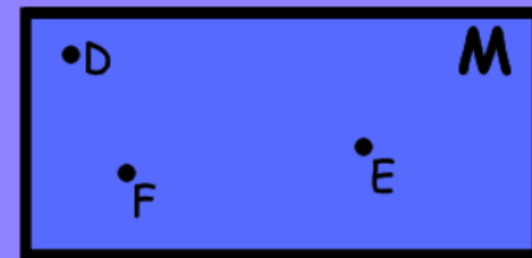
$\longleftrightarrow$  BC or  $\longleftrightarrow$  CB

## Plane

\*Two dimensions

\*Represented by a shape that looks like a floor or a wall, but extends without end.

\*Named by 3 upper case letters (in some cases one upper case bold letter).



plane DEF or plane M

### More about Lines:

\*Through any two points, there is exactly one line.

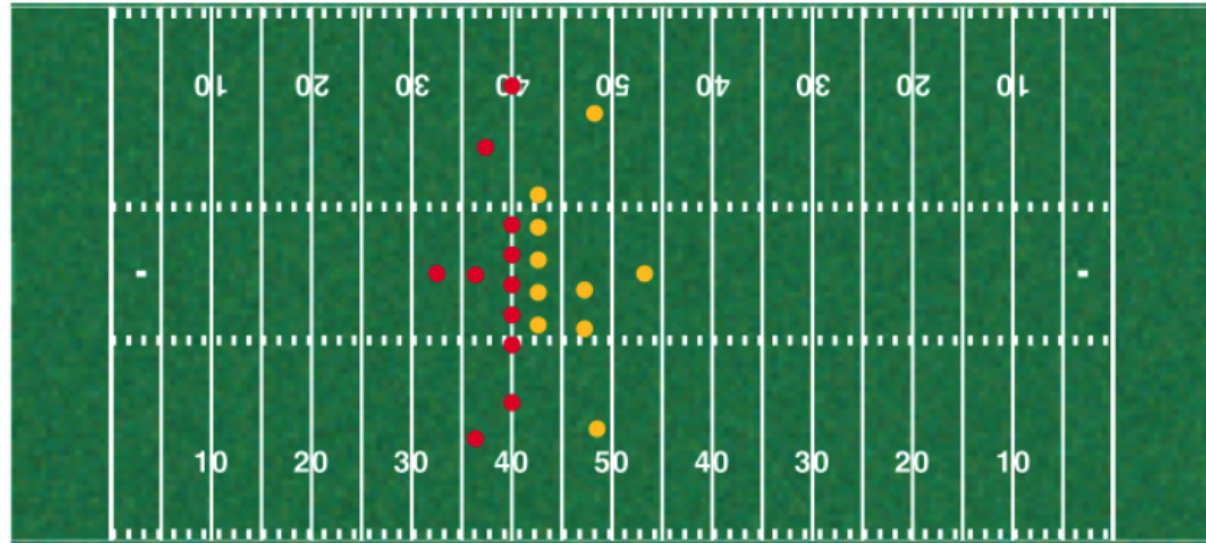
\*You can use any two points on a line to name it.

### More about Planes:

\*Through any three points not on the same line, there is exactly one plane.

\*You can use three points that are not on the same line to name a plane.

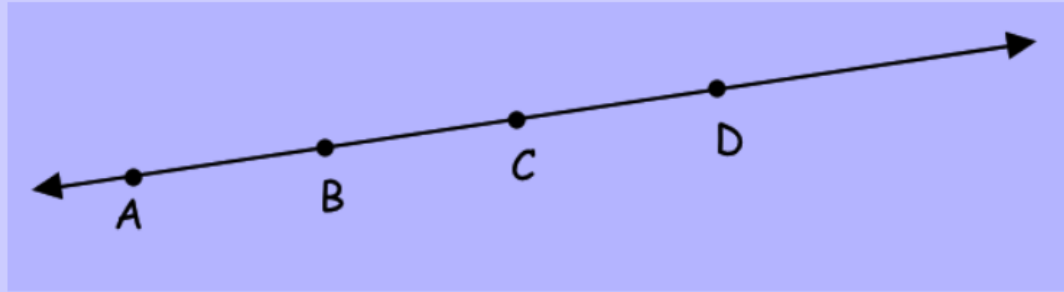
In the diagram of a football field, the positions of players are represented by *points*. The yard lines suggest *lines*, and the flat surface of the playing field can be thought of as a *plane*.



Anyone want to guess what  
**COLLINEAR** or **COPLANAR**  
mean?

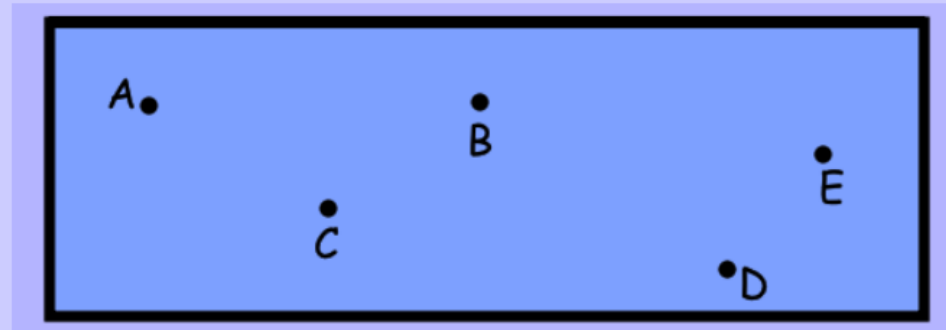
### \*collinear points-

Points that lie on the same Line



### \*coplanar points-

Points that lie on the same Plane



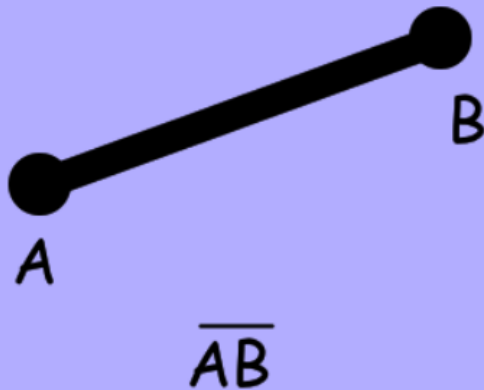
**\*defined terms-** Terms that can be described using known words such as point or line

**\*line segment or segment-** Consists of 2 endpoints and all points between the two endpoints

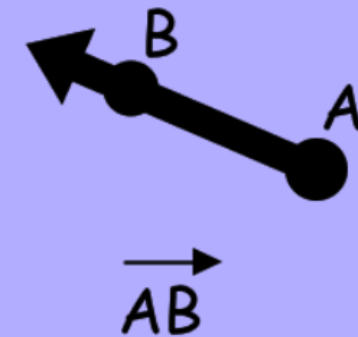
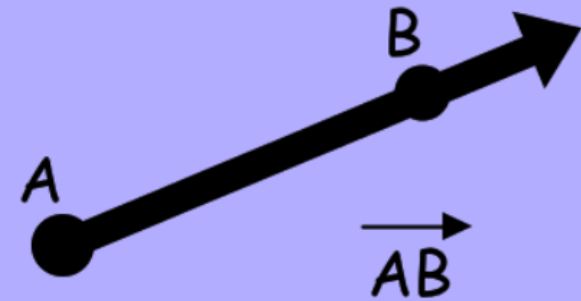
**\*endpoints-** Points that are at the end of a line segment

**\*ray-** Consists of an endpoint and all points in the direction that the ray extends.

## Line Segment



## Ray



\*Both are named with two upper case letters



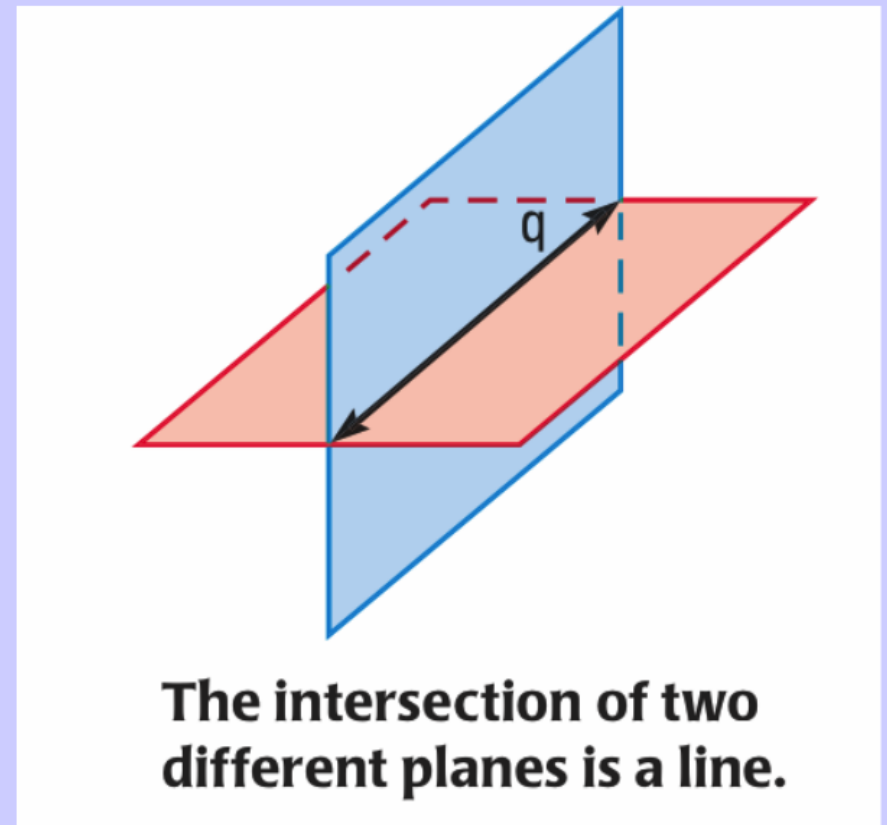
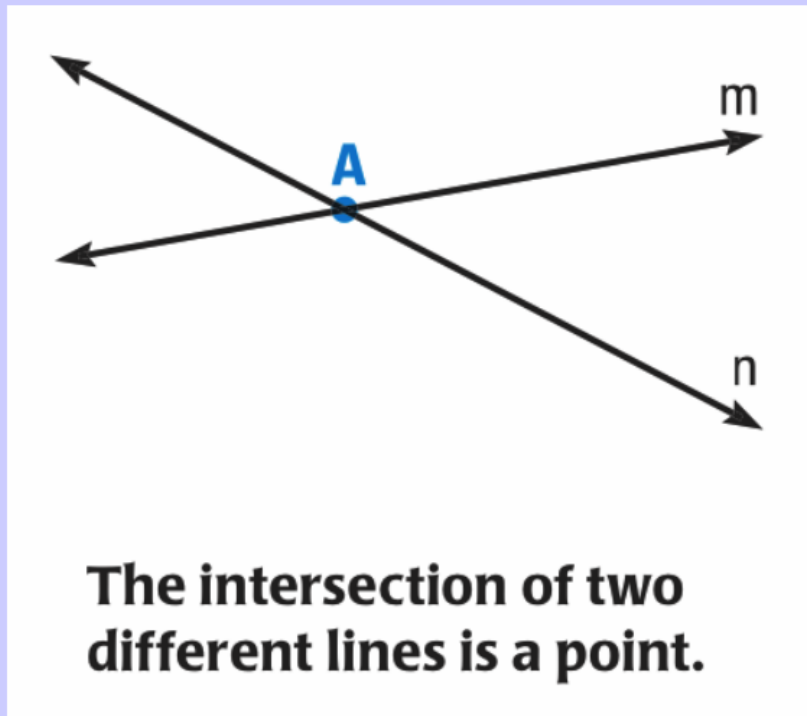
\*opposite rays - Consists of two collinear rays that extend in the opposite direction

(They should form a straight line...they are Collinear)



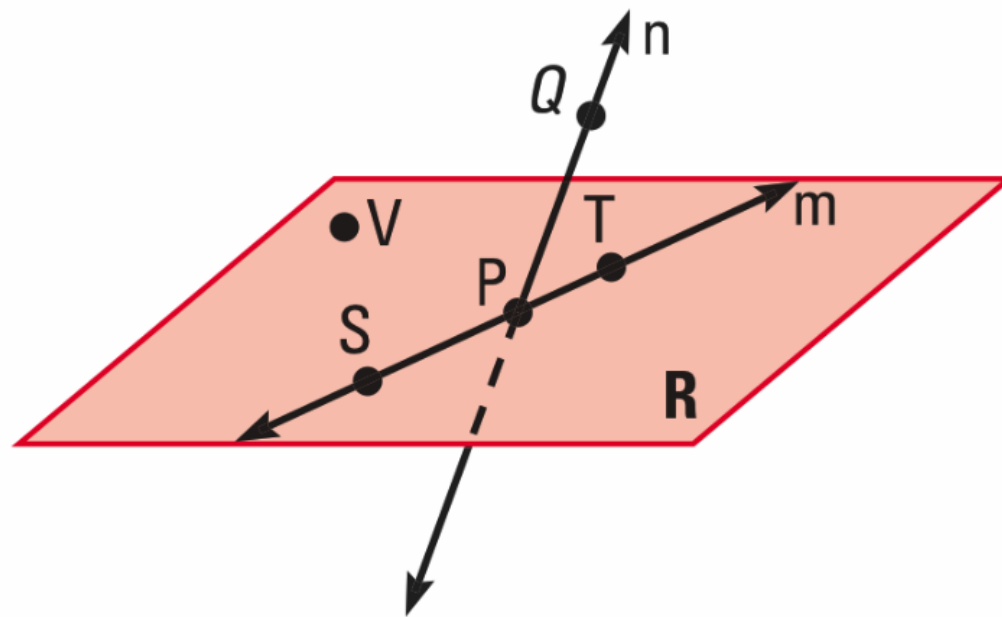
ray  $\vec{CA}$  and ray  $\vec{CB}$  are opposite rays

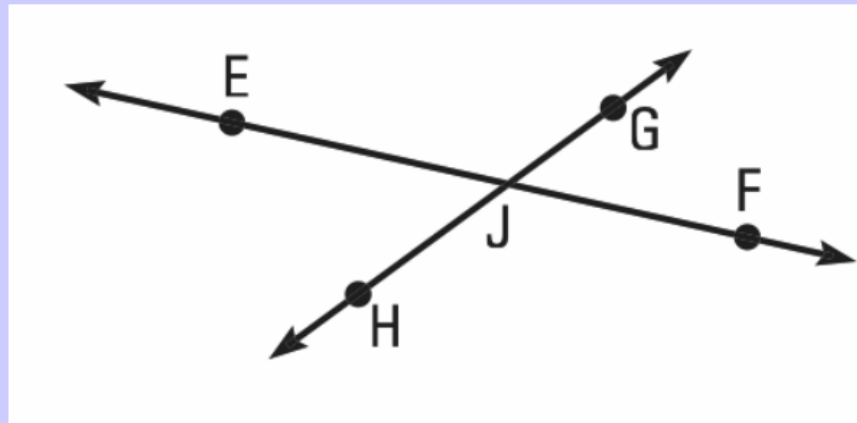
**\*intersection-** The set of points the figures have in common



## EXAMPLE 1 Name points, lines, and planes

- a. Give two other names for  $\overleftrightarrow{PQ}$  and for plane  $R$ .
- b. Name three points that are collinear. Name four points that are coplanar.

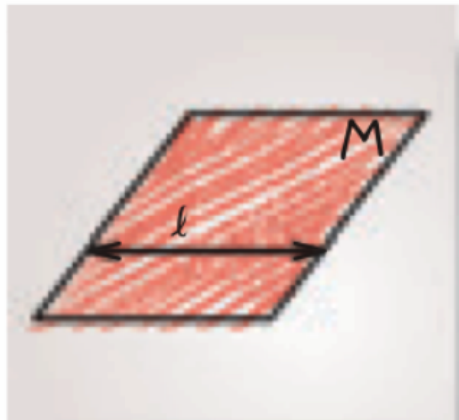
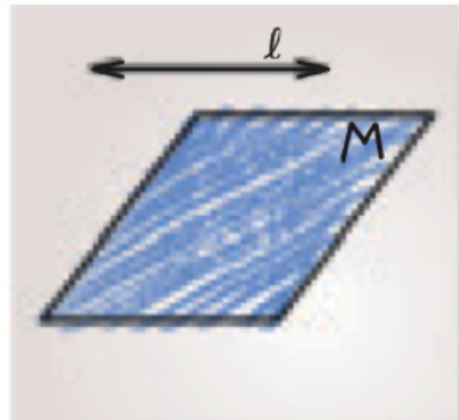
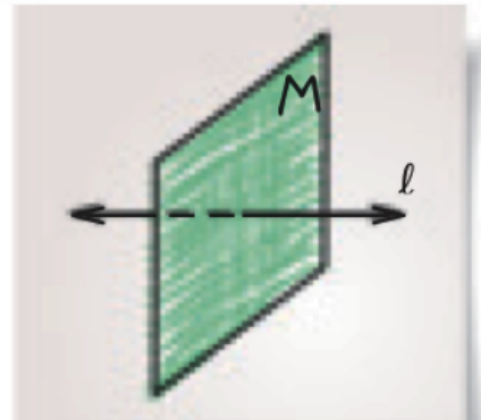


**EXAMPLE 2** Name segments, rays, and opposite rays

- Give another name for  $\overline{GH}$ .
- Name all rays with endpoint J. Which of these rays are opposite rays?

**EXAMPLE 3** Sketch intersections of lines and planes

- Sketch a plane and a line that is in the plane.
- Sketch a plane and a line that does not intersect the plane.
- Sketch a plane and a line that intersects the plane at a point.

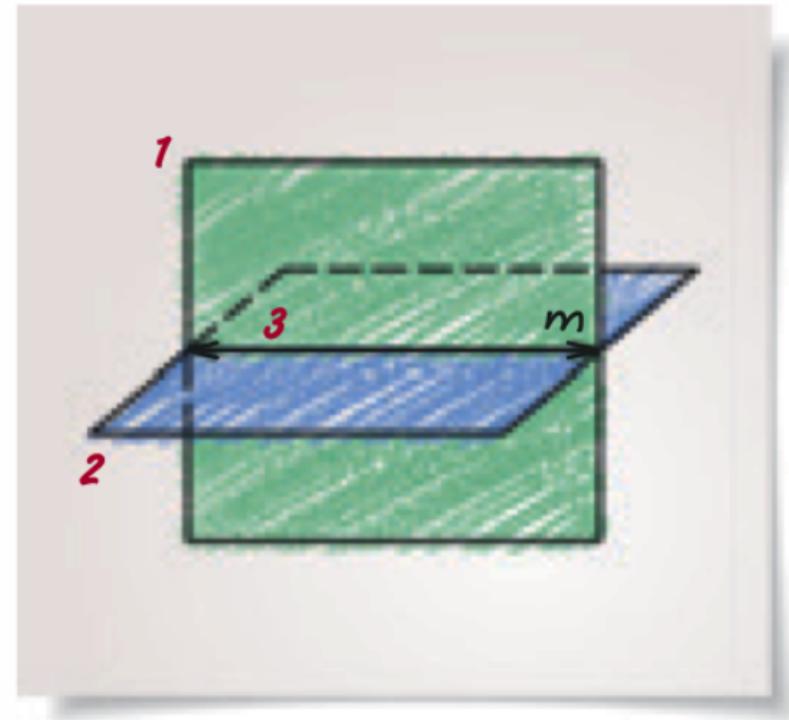
**Solution****a.****b.****c.**

## EXAMPLE 4 Sketch intersections of planes

Sketch two planes that intersect in a line.

### Solution

- STEP 1** Draw a vertical plane. Shade the plane.
- STEP 2** Draw a second plane that is horizontal. Shade this plane a different color. Use dashed lines to show where one plane is hidden.
- STEP 3** Draw the line of intersection.



## **Assignment:**

p. 5 (1-22 all, 27-37 odd, 47-57 odd)