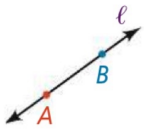
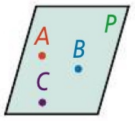
Points, Lines, and Planes

Goal: To understand basic terms of geometry.

take note

Key Concept Undefined Terms

Term Description	How to Name It	Diagram
A **point** indicates a location and has no size.	You can represent a point by a dot and name it by a capital letter, such as A.	
A **line** is represented by a straight path that extends in two opposite directions without end and has no thickness. A line contains infinitely many points.	You can name a line by any two points on the line, such as $\overleftrightarrow{AB}$ (read "line AB") or $\overleftrightarrow{BA}$, or by a single lowercase letter, such as line ℓ.	
A **plane** is represented by a flat surface that extends without end and has no thickness. A plane contains infinitely many lines.	You can name a plane by a capital letter, such as plane P, or by at least three points in the plane that do not all lie on the same line, such as plane ABC.	

Def: Points that lie on the same line are _____.

Fact: A line is made up of an infinite amount of collinear points.

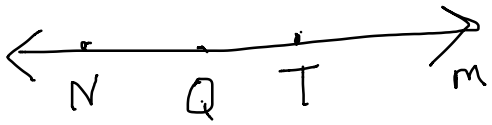
Def: Points and lines that lie in the same plane are _____.

Fact: A plane is made up of an infinite number of coplanar lines.

Note: All the points of a line are coplanar.

Ex 1) Use the diagram shown to answer the questions below.

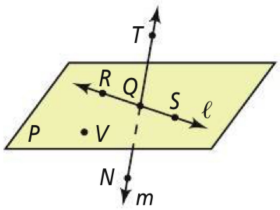
A) What are two other ways to name $\overleftrightarrow{QT}$?



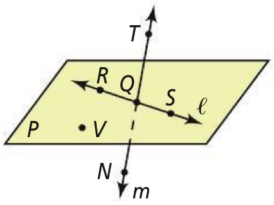
B) What are two other ways to name plane P?

Note: You must name a plane by listing the points in consecutive order, in either the clockwise or counter-clockwise direction around the plane.

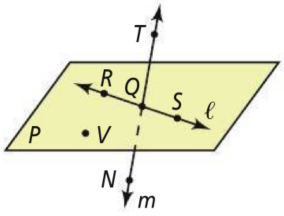
C) What are the names of three collinear points?



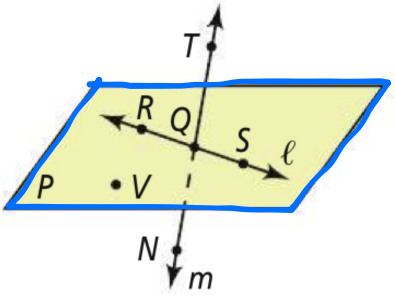
D) What are the names of four coplanar points?



E) What are two other ways to name $\overleftrightarrow{RS}$?

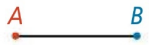
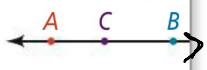


F) What are two points that are NOT coplanar with points R, S, and V?



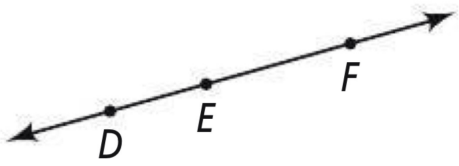
take note

Key Concept Defined Terms

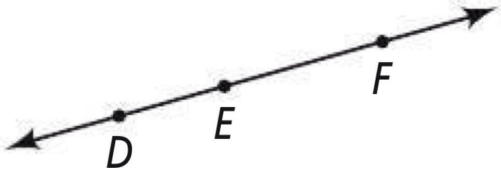
Definition	How to Name It	Diagram
A **segment** is part of a line that consists of two endpoints and all points between them.	You can name a segment by its two endpoints, such as $\overline{AB}$ (read "segment AB") or $\overline{BA}$.	
A **ray** is part of a line that consists of one endpoint and all the points of the line on one side of the endpoint.	You can name a ray by its endpoint and another point on the ray, such as $\overrightarrow{AB}$ (read "ray AB"). The order of points indicates the ray's direction.	
Opposite rays are two rays that share the same endpoint and form a line.	You can name opposite rays by their shared endpoint and any other point on each ray, such as $\overrightarrow{CA}$ and $\overrightarrow{CB}$.	

Ex 2) Use the figure given to answer the following questions.

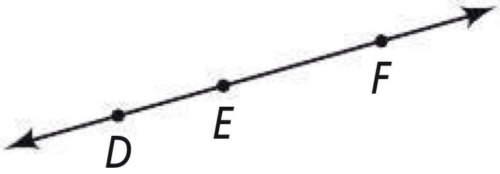
A) What are the names of the segments in the



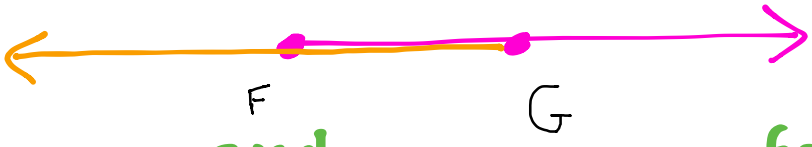
figure?



B) What are the names of the rays in the figure?



C) Which rays are opposite rays?



D) _____ and _____ form a line. Are they opposite rays? Explain.

Intersections:

Lines intersect at exactly one _____.

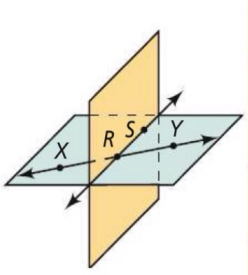
Planes intersect at exactly one _____.

**2 strings/2 papers

Lesson Check:

Use the figure to answer these questions:

1. What are 2 other names for $\overleftrightarrow{XY}$?



_____ _____

2. Find a set of opposite rays

3. What is the intersection of the 2 planes (name it)

Lesson Check part 2:

4. A segment has end points R and S-what are two ways to name it?

5. A) Draw these 2 rays: $\overrightarrow{AB}$, $\overrightarrow{BA}$

B) Are the 2 rays the same? Why?

6. A) How is naming a ray similar to naming a line?

B) How is it different?