Geometry Lesson 1

Date: _____

Objective: TSW know and understand points, lines, and planes.

Period: _____

In geometry, a definition of a term is a statement that defines a mathematical object. Definitions usually reference other mathematical terms. A basic mathematical term that is not defined using other mathematical terms is called an _____ term. In geometry, points, lines, and planes are _____ terms that are the building blocks used for defining other terms.

A _____ names a location and has no size. It is represented by a dot and labeled using a capital letter, such as *P*.

A _____ is a straight path that has no thickness and extends forever. There are an infinite number of points on a line. A line is named using either a lowercase letter or any two points on the line. Two possible names for the line shown in the diagram are _____ and _____ *x*.
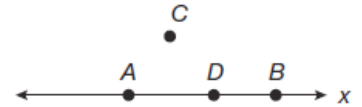
Any set of points that lie on the same line are called _____ points. In the diagram, *A*, *B*, and *D* are collinear.

If points do not lie on the same line, they are _____. Points *A*, *B*, and *C* are noncollinear.
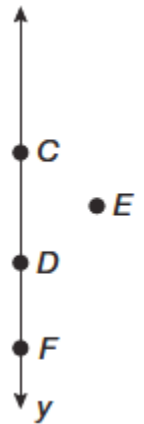
Example 1 Identifying Lines and Collinear Points
a. Give two different names for the line.
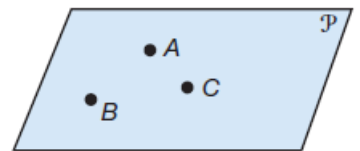   SOLUTION

b. Name three collinear points and three noncollinear points.
        SOLUTION

A _____ is a flat surface that has no thickness and extends forever. A plane is named using either an uppercase letter or _____ noncollinear points that lie in the plane. The plane in the diagram below could be called _____ *P* or plane _____.

Lines or points that are in the same plane are said to be _____. If there is no plane that contains the lines or points, then they are noncoplanar.
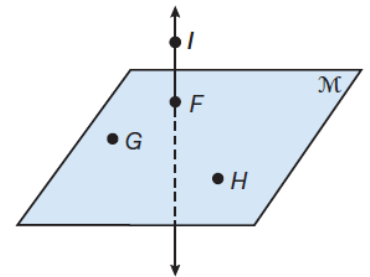
_____ is the set of all points. Therefore, space includes all lines and all planes.

Example 2 Identifying Planes
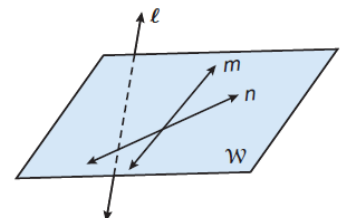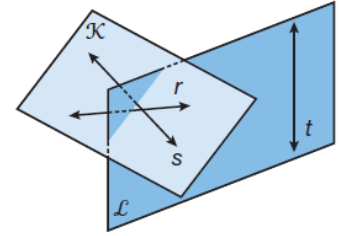What are two different names for this plane?
        SOLUTION

Example 3 Identifying Coplanar Lines
a. Identify the coplanar and noncoplanar lines in the diagram.
        SOLUTION

b. Identify the coplanar and noncoplanar lines in the diagram.
      SOLUTION

An _____ is the point or set of points in which two figures meet.

When two lines intersect, their intersection is a single _____.

When two planes intersect, their intersection is a single _____.

If a line lies in a plane, then their intersection is the _____ itself. If the line does not lie in the plane, then their intersection is a single _____.

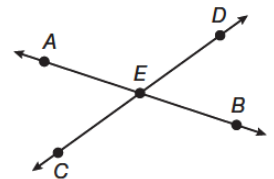Lines *q* and *m* intersect at point Q. Plane R intersects plane P at line ____.

The intersection of plane R and line *m* is line ____.

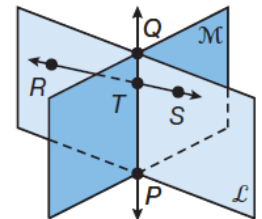Line *q* intersects planes R and P at point ____.
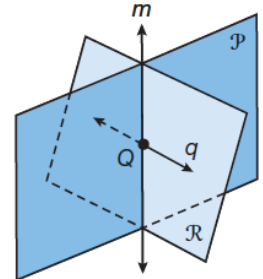
Example 4 Intersecting Lines and Planes
a. What is the intersection of $\overleftrightarrow{AB}$ and $\overleftrightarrow{CD}$?
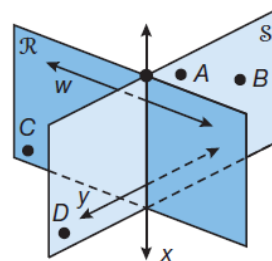   SOLUTION

b. What is the intersection of $\overleftrightarrow{PQ}$ and $\overleftrightarrow{RS}$? What is the intersection of planes M and L?
      SOLUTION

You Try!!!!
Identify each of the following from the diagram.
a. All of the lines.

b. A pair of collinear points.

c. All of the planes.

d. Three coplanar points.

e. Two coplanar lines.

f. A pair of noncoplanar lines.

Use the diagram to answer each question.
g. What is the intersection of $\overleftrightarrow{JK}$ and $\overleftrightarrow{NM}$?

h. What is the intersection of $\overleftrightarrow{JK}$ and plane W?
What is the intersection of $\overleftrightarrow{NP}$ and plane W?