

Geometry 1.1

Identify and model points, lines, planes

Identify intersecting lines and planes

primitive

undefined term (starting place)

point

location

line

straight 2+

plane

surface

• collinear

on same line

coplanar

same plane

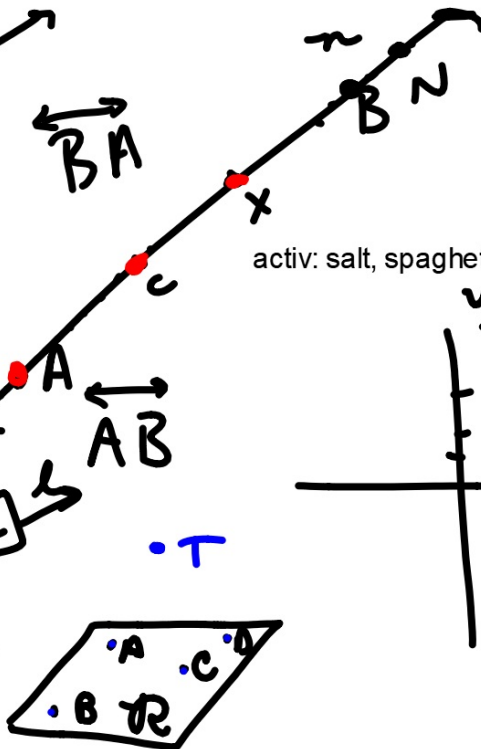
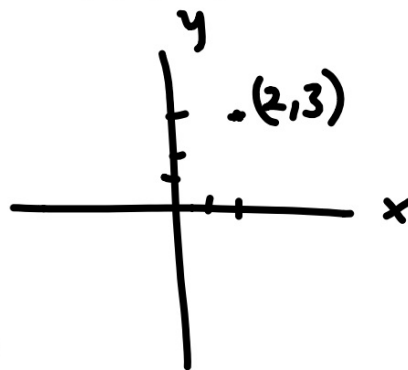
intersection

definition

defined term

space

activ: salt, spaghetti, index cards



1 Points, Lines, and Planes Unlike the real-world objects that they model, shapes, points, lines, and planes do not have any actual size. In geometry, *point*, *line*, and *plane* are considered **undefined terms** because they are only explained using examples and descriptions.

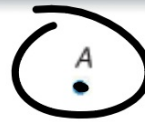
"primitive terms"

KeyConcept Undefined Terms

A **point** is a location. It has neither shape nor size.

Named by a capital letter

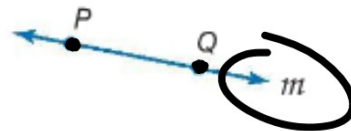
Example point A



A **line** is made up of points and has no thickness or width. There is exactly one line through any two points.

Named by the letters representing two points on the line or a lowercase script letter

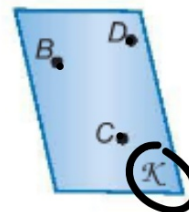
Example line m , line PQ or $\overleftrightarrow{PQ}$, line QP or $\overleftrightarrow{QP}$



A **plane** is a flat surface made up of points that extends infinitely in all directions. There is exactly one plane through any three points not on the same line.

Named by a capital script letter or by the letters naming three points that are not all on the same line

Example plane $\mathcal{K}$, plane BCD , plane CDB , plane DCB , plane DBC , plane CBD , plane BDC



OK

Collinear points are points that lie on the same line. **Noncollinear** points do not lie on the same line. **Coplanar** points are points that lie in the same plane. **Noncoplanar** points do not lie in the same plane.

Sometimes there is more than one correct name for ...



Example 1 Name Lines and Planes

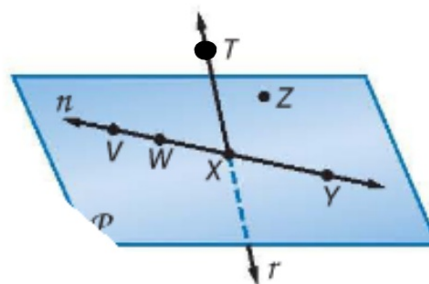
Use the figure to name each of the following.

a. a line containing point W

$\overleftrightarrow{WY}$

b. a plane containing point X

plane ZXY VXZ
 P



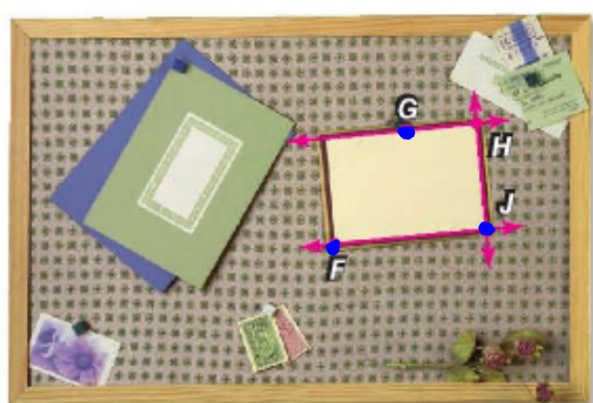
Guided Practice

1A. a plane containing points T and Z

TZX

1B. a line containing point T

$\overleftrightarrow{XT}$



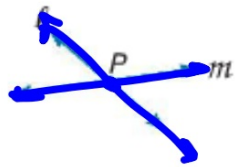
GuidedPractice

Name the geometric term modeled by each object.

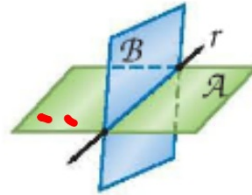
2A. stripes on a sweater

2B. the corner of a box

2 Intersections of Lines and Planes The **intersection** of two or more geometric figures is the set of points they have in common. Two lines intersect in a point. Lines can intersect planes, and planes can intersect each other.



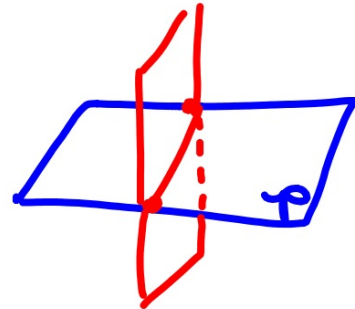
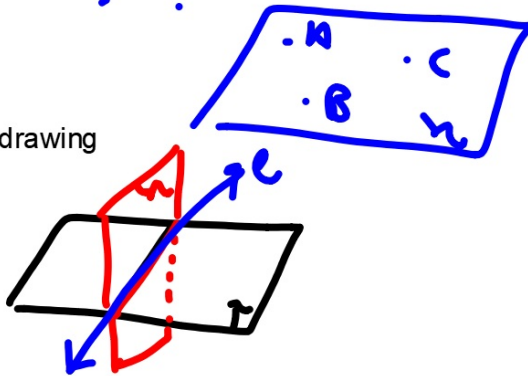
P represents the intersection of lines l and m .



Line r represents the intersection of planes A and B .

P. 8
13-47.022

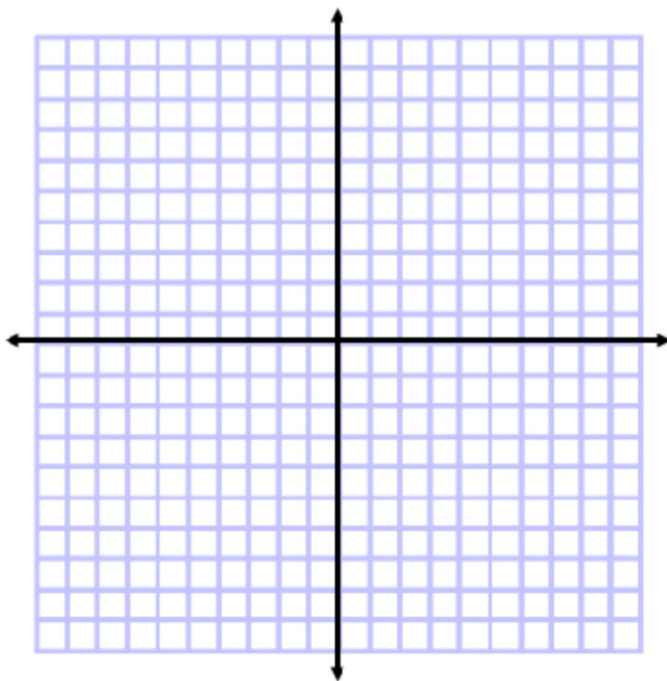
Practice drawing



Example 3 Draw Geometric Figures

Draw and label a figure for each relationship.

- a. **ALGEBRA** Lines AB and CD intersect at E for $A(-2, 4)$, $B(0, -2)$, $C(-3, 0)$, and $D(3, 3)$ on a coordinate plane. Point F is coplanar with these points, but not collinear with $\overleftrightarrow{AB}$ or $\overleftrightarrow{CD}$.



note: you can only use a letter once in any given figure

b. QR intersects plane $\mathcal{T}$ at point S .

► **Guided**Practice

- 3A.** Points $J(-4, 2)$, $K(3, 2)$, and L are collinear.
- 3B.** Line p lies in plane $\mathcal{N}$ and contains point L .

Example 4 Interpret Drawings



StudyTip

CCSS Precision A point has no dimension. A line exists in one dimension. However, a circle is two-dimensional, and a pyramid is three-dimensional.

