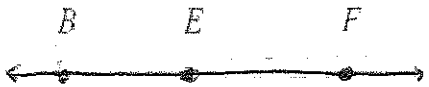
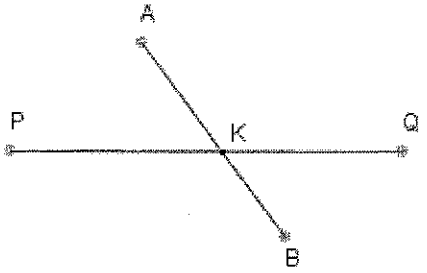
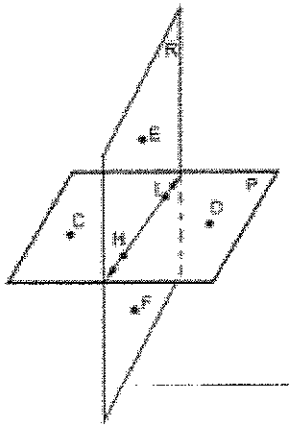
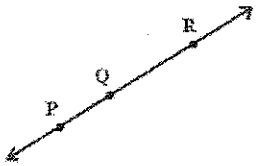
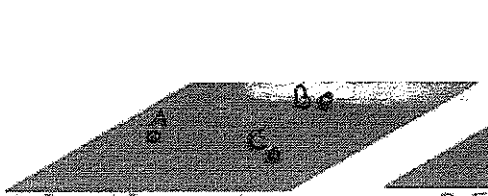
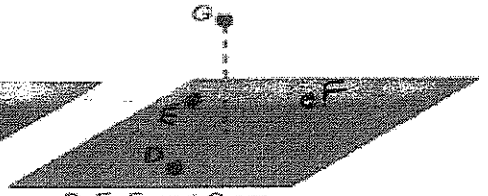
Name:_____ Date:_____ 1.2 Notes

Points, Lines, and Planes

	Definition	Figure	Symbol
	- A location - It has no size (dimension)	• P	P or Point P Use 1 variable to name it
	- Is perfectly straight and extends infinitely in opposite directions. - It is 1-D (length)		$\overleftrightarrow{AB}$ or $\overleftrightarrow{BA}$ Or line *AB* or Line ℓ Use 2 variables to name it
	- A perfectly flat surface that extends infinitely in all directions. - It is 2-D (length and width)		Plane EFG or Plane T Need 3 variables to name it
	- The point of a line between two endpoints - Has 2 endpoints		$\overline{XY}$ or $\overline{YX}$ Or Segment *AB* Use 2 variables to name it
	- Part of a line that starts at one point and extends infinitely in the other direction.		$\overrightarrow{PQ}$ Or Ray *PQ* Use 2 variables to name it Use 2 variables to name it
	- Rays that extend in opposite directions forming a line - They must have the same starting endpoint		opposite rays: $\overrightarrow{EB}$ and $\overrightarrow{EF}$

	- The set of points that two or more geometric figures have in common	Example 1:  Example 2:  	The intersection of two different lines is a **point** Point K is the point of intersection The intersection of two different planes is a **line** Line HI is the intersection
	- Points that lie on the same line	 	**Collinear points P, Q, and R.**
	- Points and lines that lie in the same plane	 *A, B, and C are coplanar*  *D, E, F, and G are not coplanar*	

Date:_____

1-2: Points, Lines and Planes

Take note

Postulates 1-1, 1-2, 1-3, and 1-4

Complete each postulate with *line, plane,* or *point.*

Postulate 1-1 Through any two points there is exactly one ? . _____

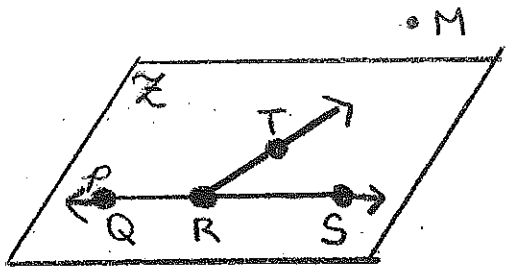
Postulate 1-2 If two distinct lines intersect, then they intersect in exactly one ? . _____

Postulate 1-3 If two distinct planes intersect, then they intersect in exactly one ? . _____

Postulate 1-4 Through any three noncollinear points there is exactly one ? . _____

EXAMPLE: 1.

1. Name the points in the figure.



2. Name the plane.

3. Name a line.

4. Name 3 collinear points.

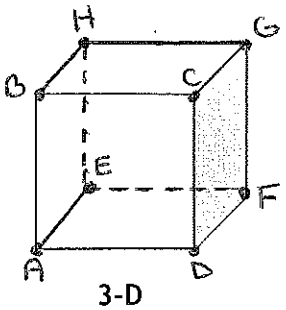
5. Name 2 coplanar points.

6. Name a ray.

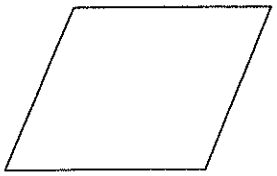
7. Name a pair of opposite rays.

8. Name a line segment.

Date:_____



3-D



2-D

1-D

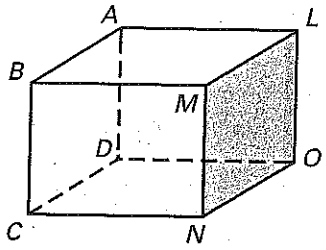
No-D

The 3-D cube is composed of 6 planes.

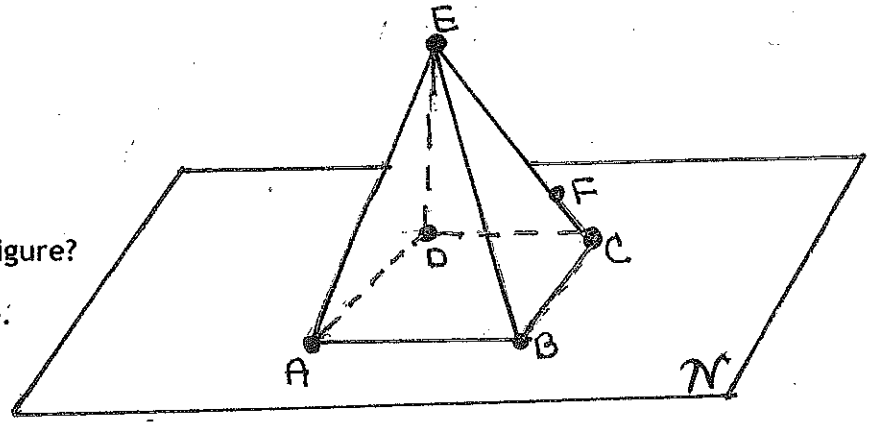
Front:	Left:	Top:
Back:	Right:	Bottom:

Example 2: Use the figure to the right to answer the following questions.

1. Name the intersection of $\overleftrightarrow{AL}$ and $\overleftrightarrow{LO}$
2. Name the intersection of plane ABC and plane LOD
3. Name three planes that intersect at point O
4. Name three lines that intersect at point N



Example 3: Use the figure below to answer the following questions.



5. How many planes are shown in the figure?
6. Name the planes shown in the figure.
7. Name three collinear points
8. Name a point that is NOT coplanar with points A, B, and C
9. Name four points that are coplanar
10. Name the intersection of plane N and the plane that contains points A, E, and D

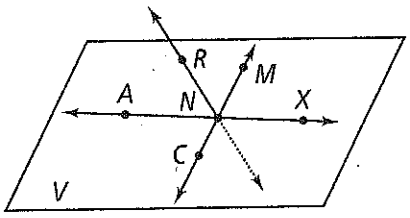
Name _____

1-2 Practice

Form G

Points, Lines, and Planes

Use the figure below for Exercises 1–8. Note that $\overleftrightarrow{RN}$ pierces the plane at *N*. It is not coplanar with *V*.

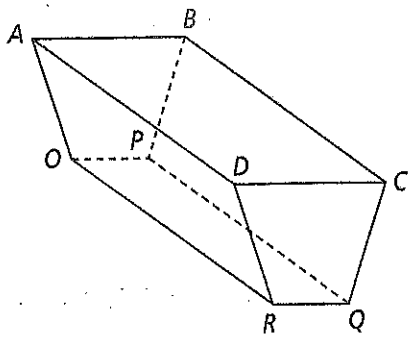


1. Name two segments shown in the figure.
2. What is the intersection of $\overleftrightarrow{CM}$ and $\overleftrightarrow{RN}$?
3. Name three collinear points.
4. What are two other ways to name plane *V*?
5. Are points *R*, *N*, *M*, and *X* coplanar?
6. Name two rays shown in the figure.
7. Name the pair of opposite rays with endpoint *N*.
8. How many lines are shown in the drawing?

For Exercises 9–14, determine whether each statement is *always*, *sometimes*, or *never* true.

9. $\overrightarrow{GH}$ and $\overrightarrow{HG}$ are the same ray.
10. $\overrightarrow{JI}$ and $\overrightarrow{JL}$ are opposite rays.
11. A plane contains only three points.
12. Three noncollinear points are contained in only one plane.
13. If $\overleftrightarrow{EG}$ lies in plane *X*, point *G* lies in plane *X*.
14. If three points are coplanar, they are collinear.
15. **Reasoning** Is it possible for one ray to be shorter in length than another? Explain.

Use the figure at the right for Exercises 21–29. Name the intersection of each pair of planes or lines.



21. planes *ABP* and *BCD*
22. $\overleftrightarrow{RQ}$ and $\overleftrightarrow{RO}$
23. planes *ADR* and *DCQ*
24. planes *BCD* and *BCQ*
25. $\overleftrightarrow{OP}$ and $\overleftrightarrow{QP}$

Name two planes that intersect in the given line.

26. $\overleftrightarrow{RO}$
27. $\overleftrightarrow{CQ}$
28. $\overleftrightarrow{DA}$
29. $\overleftrightarrow{BP}$