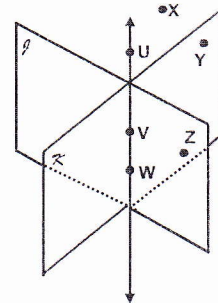


## NOTES 1.1: POINTS, LINES & PLANES

TERM	DESCRIPTION	SKETCH	HOW TO NAME IT
POINT	<ul style="list-style-type: none"> <li>• names a location</li> <li>• has no size or shape</li> <li>• represented by a dot</li> </ul>		
LINE	<ul style="list-style-type: none"> <li>• a straight path</li> <li>• has no thickness</li> <li>• goes on forever in 2 directions</li> </ul>		
PLANE	<ul style="list-style-type: none"> <li>• a flat surface</li> <li>• has no thickness</li> <li>• goes on forever in all directions</li> </ul>		
COLLINEAR	<ul style="list-style-type: none"> <li>• points that lie on the same line</li> </ul>		
COPLANAR	<ul style="list-style-type: none"> <li>• points or lines that lie on the same plane</li> </ul>		

### EXAMPLES:

<p>1. Name three points that determine plane <math>\beta</math>.</p> <p>Points:</p>	<p>2. Name the intersection of planes <math>\beta</math> and <math>\alpha</math>.</p> <p>Intersection:</p>
<p>3. Name a set of collinear points, and a set of non-collinear points.</p> <p>Collinear Points:</p> <p>Non-Collinear Points:</p>	<p>4. Name a set of points, other than those in EXAMPLE 1 that are coplanar.</p> <p>Points:</p>



**Postulates** are statements that are assumed to be TRUE.

The following are postulates concerning the three basic elements in geometry.

- A line contains:
- Through any two points there is:
- A plane contains at least:
- Through any three points there is \_\_\_\_\_ one plane, and through any three

**NON-COLLINEAR** points there is \_\_\_\_\_ one plane.

- If two points are in a plane, then the \_\_\_\_\_ that contains the points is also in the plane.
- If two planes intersect, then their intersection is a \_\_\_\_\_.

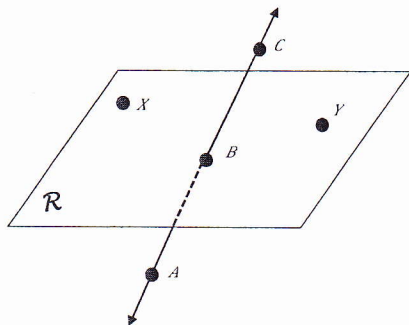
**Theorems** are important statements that must be proven.

The following are theorems about these basic elements in geometry.

- If two lines intersect, then they intersect at:
- If two lines intersect, then:

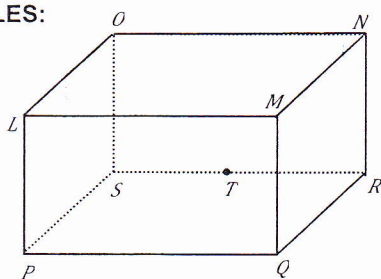
TERM	DESCRIPTION	SKETCH	HOW TO NAME IT
Line Segment	<ul style="list-style-type: none"> <li>part of a line</li> <li>consists of 2 endpoints and all points between</li> </ul>		
Ray	<ul style="list-style-type: none"> <li>part of a line</li> <li>has 1 endpoint</li> <li>goes on forever in 1 direction</li> </ul>		
Opposite Rays	<ul style="list-style-type: none"> <li>2 rays that share the same endpoint</li> <li>extend indefinitely in opposite directions</li> </ul>		

EXAMPLES:



1. Name all line segments.
2. Name all rays.
3. Name a pair of opposite rays.

EXAMPLES:



1. Are points  $S$ ,  $O$ , and  $M$  coplanar?  
Why or why not?
2. How many "planes" are shown?
3. Name the intersection of planes  $LON$  and  $PQM$ :  
Explain:
4. Name the intersection of plane  $MQR$  and  $\overline{ON}$ . \_\_\_\_\_ Explain.
5. Do  $S$  and  $M$  determine a line? \_\_\_\_\_ Why or why not?
6. How many lines are there through points  $N$  and  $Q$ ? \_\_\_\_\_ Explain.
7. How many planes are there through points  $S$ ,  $T$ , and  $R$ ? \_\_\_\_\_ Explain.
8. Name the intersection of  $\overline{PS}$  and  $\overline{OS}$ . \_\_\_\_\_ Explain.
9. How many planes contain  $\overline{LO}$  and  $\overline{OS}$ ? \_\_\_\_\_ Explain.
10. Is  $\overline{OM}$  in plane  $LMN$ ? \_\_\_\_\_ Why or why not?