Postulates and Theorems Relating Points, Lines, and Planes
Postulate 5

- A line contains at least two points; a plane contains at least three points not all in one line; space contains at least four points not all in one plane
Postulate 6

- Through any two points there is exactly one line
Postulate 7

Through any three points there is at least one plane, and through any three noncollinear points there is exactly one plane.
Postulate 8

- If two points are in a plane, then the line that contains the points is in that plane.
Postulate 9

- If two planes intersect, then their intersection is a line
Theorems

- Rules that are proven
Theorem 1-1

- If two lines intersect, then they intersect in exactly one point
Theorem 1-2

- Through a line and a point not on the line there is exactly one plane
Theorem 1-3

- If two lines intersect, then exactly one plane contains the lines
Example 1

- Answer yes or no then state the postulate that helped to determine your answer

- A) Do two intersecting lines determine a plane? 
  *yes*  
  **Theorem 1-3**

- B) Do three points determine a line? 
  *no*  
  **Post. 6**

- C) Do three points determine a plane? 
  *no*  
  **Post 5 or 7**
Example 2

- Use the diagram below to answer the following questions and state the postulate that supports your answer

A) Name two points that determine line $l$

$$A, C \quad \text{Post. 6}$$

B) Name three points that determine plane $M$

$$A, B, C \quad \text{Post. 7}$$

C) Name the intersection of plane $M$ and plane $N$

$$\overleftrightarrow{AB} \quad \text{post. 9}$$

D) Does line $AD$ lie in plane $M$?

Yes \quad \text{Post. 8}

E) Does plane $N$ contain any points not on line $AB$?

Yes \quad \text{Post. 5}
Example 3

- Rewrite Theorem 1-2 using the word determine
  A line and a point not on the line, determine one plane.

- Rewrite Theorem 1-2 using the phrase one and only one
  Through a line and a point not on the line there is one and only one plane.