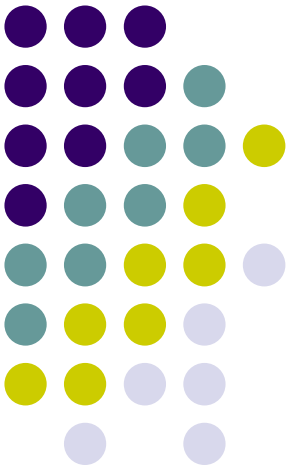
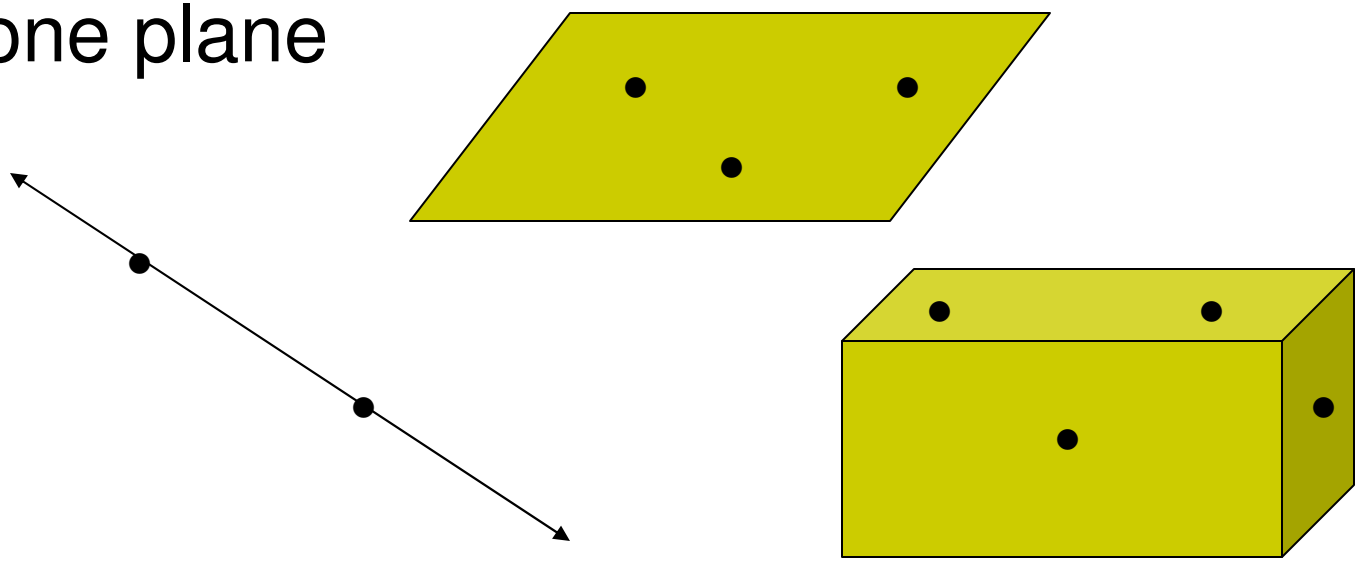
Lesson 1-5

Postulates and Theorems Relating Points, Lines, and Planes



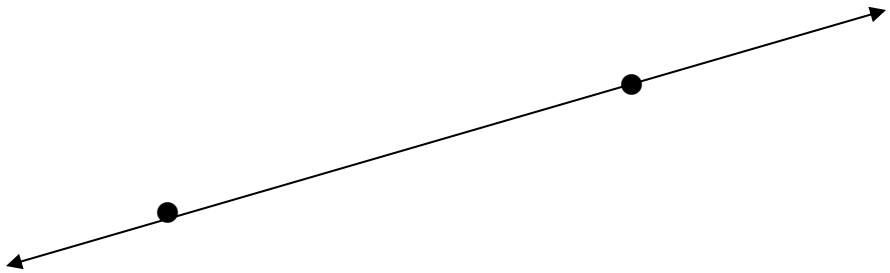
Postulate 5

- 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



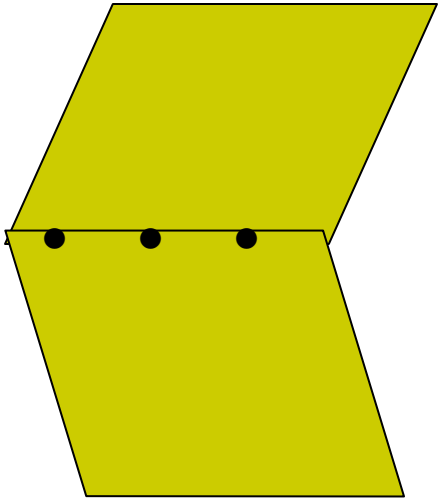
Postulate 6

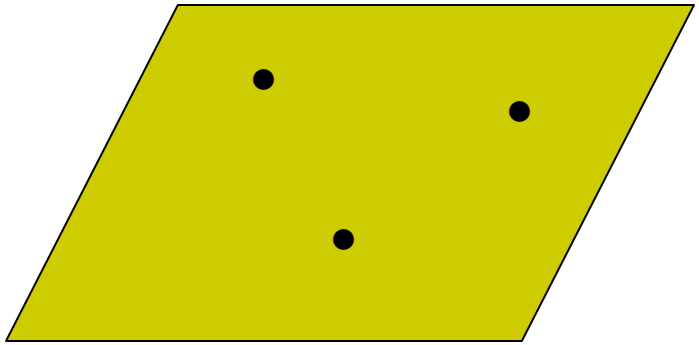
- Through any two points there is exactly one line



Postulate 7

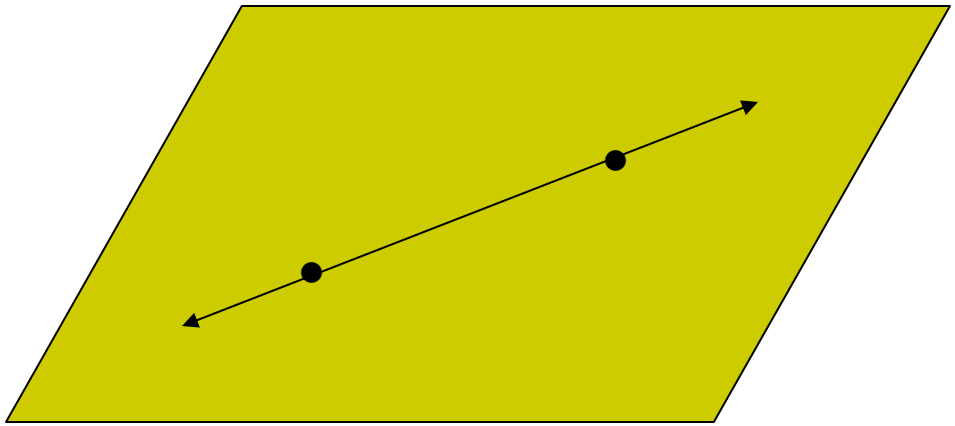
- Through any three points there is at least one plane, and through any three noncollinear points there is exactly one plane





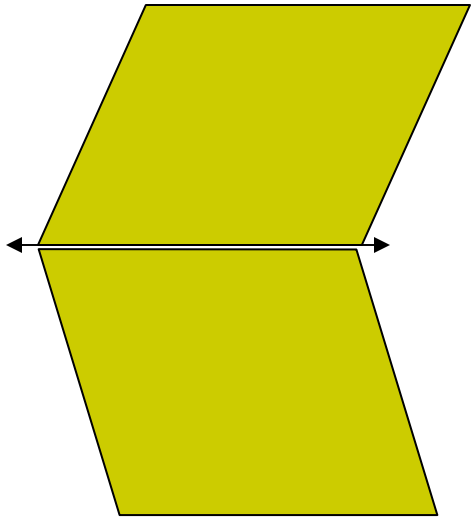
Postulate 8

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

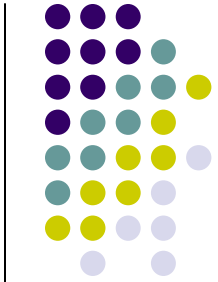


Postulate 9

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



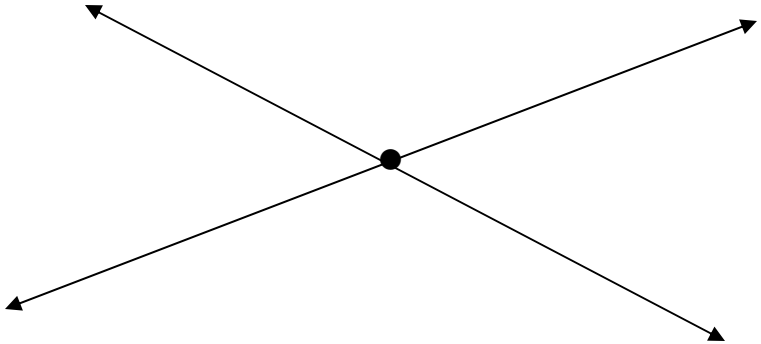
Theorems



- Rules that are proven

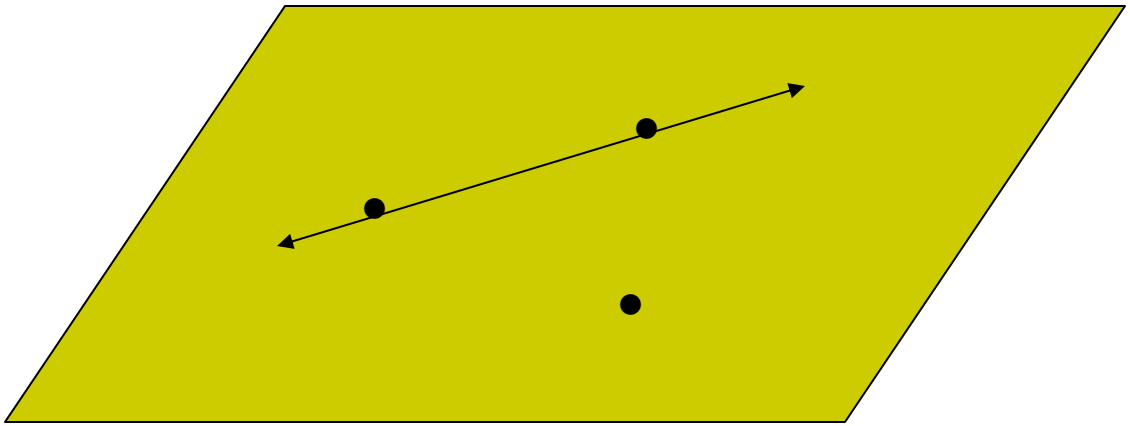
Theorem 1-1

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



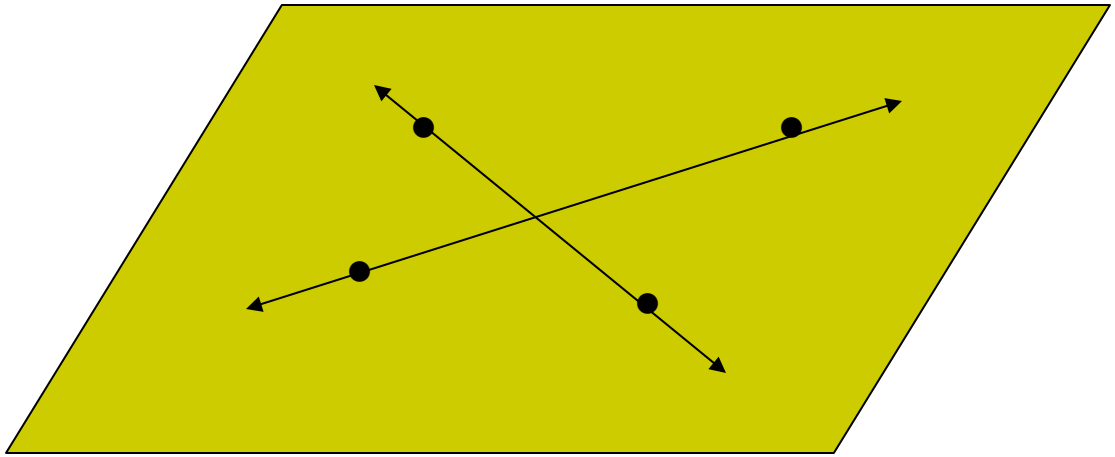
Theorem 1-2

- 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

  ↓ or Theorem

- 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 Post. 6

B) Name three points that determine plane *M*

A, B, C Post. 7

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

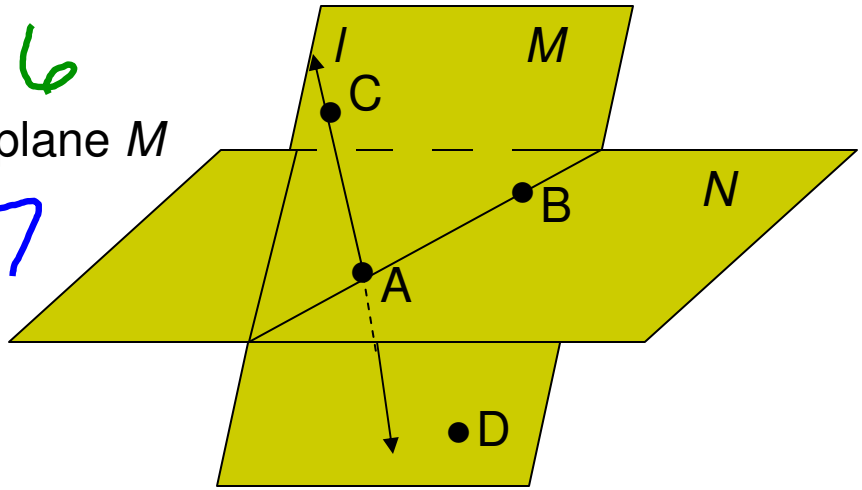
$\overleftrightarrow{AB}$ post. 9

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

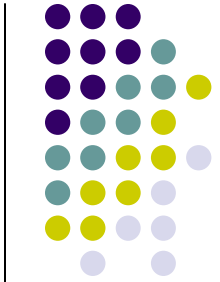
yes post. 8

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

yes 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.