and a is a line, then in place of "A lies on a," we will often substitute "a contains A," "a passes through A," "A is on a," etc. Two lines containing A are said to "intersect in A," or "have A in common." Similar terminological substitutions will be used for incidence relations involving planes.

GROUP I: THE INCIDENCE AXIOMS

I,1. For every two points A, B there exists a line a that contains each of the points A, B.

I,2. For every two points A, B there exists no more than one line that contains each of the points A, B.

I,3. There exist at least two points on a line. There exist at least three points that do not lie on a line.

[I,4. For any three points A, B, C that do not lie on the same line there exists a plane α that contains each of the three points A, B, C. For every plane there exists a point which it contains.]

[I,5. For any three points A, B, C that do not lie on one and the same line there exists no more than one plane that contains each of the three points A, B, C.]

[I,6. If two points A, B of a line a lie in a plane α then every point of a lies in the plane α.]

[I,7. If two planes α, β have a point A in common then they have at least one more point B in common.]

[I,8. There exist at least four points which do not lie in a plane.]

If A and B are two distinct points of a line, we will often denote this line by $\overleftrightarrow{AB}$.

GROUP II: THE ORDER AXIOMS

II,1. If a point B lies between a point A and a point C then the points A, B, C are three distinct points of a line, and B also lies between C and A.

II,2. For two points A and C, there always exists at least one point B on the line $\overleftrightarrow{AC}$ such that C lies between A and B.

II,3. Of any three points on a line there exists no more than one that lies between the other two.

Definition B-1

Given two distinct points A and B, the segment $\overline{AB}$ consists of the points A and B together with all points which are between A and B.