

1. Axioms about Points and Lines.

1. Line is a set of points.
2. For any two points there exists exactly one line that contains them.
3. There exists at least one line, each line contains at least one point.

2. Axioms about

Distance $d(P,Q)$

$$d(P,Q)=d(Q,P)$$

$$d(P,Q)\geq 0; d(P,Q)=0 \text{ iff } P=Q$$

$$d(P,R)\leq d(P,Q)+d(Q,R)$$

3. Axioms of Order

1. Every point O that belongs to a line p divides that line in two disjoint non-empty sets such that O lies between any two points from different sets.
2. Three points belong to one line (we say that they are collinear) if and only if one of them is between the other two.
3. Every line p divides the plane in two nonempty sets with the following property: if two points A and B belong to the same set then the segment AB does not intersect the line p , if A and B belong to the different sets then the segment AB intersects the line p .

Axiomatic method.

1. *Undefinable (basic) notions.*

2. *Axioms that describe properties of the main notions.*

3. *Definitions based on main notions.*

4. *Theorems that proved using the Axioms and definitions.*

Line

ray

halfplane

Definition. Sets in which line is divided in the axiom 3.1 are called *rays*.

Definition. Sets in which plane is divided in the axiom 3.3 are called *halfplanes*.