

## Mathematical System

A **mathematical system** consists of axioms, definitions, and undefined terms. An **axiom** is a statement that is assumed to be true. A **definition** is used to create new concepts in terms of existing ones. A **theorem** is a proposition that has been proved to be true. A **lemma** is a theorem that is usually not interesting in its own right but is useful in proving another theorem. A **corollary** is a theorem that follows quickly from a theorem.

A *mathematical system* consists of the following:

1. a set of undefined concepts,
2. a universal set,
3. a set of relations,
4. a set of operations,
5. a set of definitions,
6. a set of axioms -- these axioms pertain to the elements being studied, the relations, and the operations
7. a set of theorems,

In plane geometry the undefined concepts were those of point and line. The universal set was the set of points in the plane. The relations were such concepts as incidence, congruence, perpendicularity, and parallelism.