

Abstract

Title: Comparison of Euclid's and Hilbert's Axiomatic Systems of Geometry from the Didactic Viewpoint

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The aim of this thesis is to describe the development of axiomatic systems of geometry and its applicability in didactics of mathematics. The thesis is composed of two parts, the first of which is focused on Euclid and his work *The Elements*, the second being aimed at David Hilbert and his work *Grundlagen der Geometrie*. The thesis contains a short historical context describing the gradual development of geometry and geometrical thinking, from the ancient times up to now. It will further cover the influence of *The Elements* upon mathematics as such, its teaching, and a spread across the countries of the world and the Czech Republic in particular. A detailed view is given to the characteristics of Euclid's axiomatic system and its possible difficulties caused predominantly by a vast temporal span and translations from Greek to other languages. I will continue with the analysis of the most considerable logical gaps in *The Elements*, thus paving the way for the introduction of a modern axiomatic system of geometry, represented by David Hilbert. Apart from the main features and the structure of David Hilbert's axiomatic system, the second part of the thesis highlights possible stimuli for an alternative teaching method from the historical viewpoint – from Euclid and his approach up to still increasing level of abstraction and rigid approach of David Hilbert.

Key words: axiom, postulate, definition, proposition, Euclid, *The Elements*, David Hilbert, *Grundlagen der Geometrie*