Title: Definition of vector product

Author: David Holý

Department: Department of Mathematics Education

Supervisor: Mgr. Zdeněk Halas, DiS., Ph.D., Department of Mathematics Education

Abstract: The main goal of this thesis is to present a compelling and well-motivated definition of the vector product and to explain its properties. Torque serves as a medium through which "the rotating effect of force" is studied on simple physical examples. Elaboration leads to revealing essential properties that define the vector product. The thesis contains the derivation of Cartesian coordinates of the vector product. It also contains a list of its basic mathematical properties and applications. Lorentz force is presented as a concrete example of its application and is thoroughly analyzed. In the closing section, the term curl of a vector field is introduced and conceptually explained. The thesis was focused on bringing a good didactic presentation of a vector product, its concrete applications in practice, and its connection to more advanced fields of mathematical inquiry.