

Connecting Multiple Modes of Description and Thinking of the Concept Dot Product of Vectors in a Dynamic Geometry Environment

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Abstract

There exist many different connections in mathematics education and they can be analyzed from a wide spectrum of perspectives. This article discusses connections between three modes of description and thinking (Hillel, 2000; Sierpinska, 2000) of concepts in linear algebra and analytic geometry. The concept of dot product of vectors is in the focus of the analysis. The aim is investigation of how do students recognize, link between, translate one into another and manipulate multiple modes of description and thinking of dot product of vectors in a designed dynamic geometry environment at upper secondary education. It seems that utilization of the three modes: geometric, arithmetic and structural, brings the abstraction of the formal linear algebra theory a bit closer to the upper high school students in an adapted and 'consumable' form for this level of education.

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