

Abstract

This bachelor thesis is the summary of the chosen constructions used in descriptive and kinematic geometry. These constructions are always described in detail and proven.

The first chapter is devoted to the very concept of curve and curvature. The second chapter is focused on conic sections, ie ellipses, hyperbolas and parabolas. These curves are defined, their main characteristics are described, and their equation is derived. Further off, the chapter contains of the various kinds of constructions of these curves. It is particularly about point structures and structures using osculating circles.

The third chapter deals with the cyclic curves, ie cycloid, epicycloid, hypocycloid, pericycloid and involute of a circle. For these curves, the motion by which they arise is defined, and the given curve's parametric expression is presented. The following is a description of the construction of this motion and proof that the points of this construction correspond to the parametric expression of the cyclic curve.

Finally, the fourth chapter focuses on conchoids, which together with cyclic curves rank among the kinematic curves. Even here the motion by which conchoids are created is first introduced, the construction of this motion is described, and it is proved that the constructed points correspond to the equation of the searched curve. Specifically, for the conchoid of a circle, the construction of limaçon of Pascal is proven.

All constructions are supplemented by an interactive construction in the GeoGebra program, which can be used to teach in secondary school.

Keywords

Geometry, construction, conic sections, cyclic curves, conchoids.