

**University of Kragujevac**  
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## **Multiple orthogonal polynomials on the semicircle**

### **Seminar 2**

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Multiple orthogonal polynomials on the semicircle are generalizations of polynomials orthogonal on the semicircle with respect to a complex-valued inner product

$$[f, g] = \int_0^\pi f(e^{i\theta})g(e^{i\theta})d\theta.$$

A generalization is in the sense that multiple orthogonal polynomials on the semicircle satisfy  $r \in \mathbb{N}$  orthogonality conditions with respect to a set of  $r$  different weight functions.

In this paper definitions and properties of multiple orthogonal polynomials on the semicircle are given. We study some interesting properties of zeros of multiple orthogonal polynomials on the semicircle with respect to the Gegenbauer weight functions. These properties are symmetry of zeros with respect to the imaginary axis, location of zeros and multiplicity of zeros.