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Title: Theory of Orthogonal Polynomials and Construction of Differential Operators with Orthogonal Polynomials as Eigenfunction

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Abstract: The subject of orthogonal polynomials is a classical one whose origins can be traced to Legendre's work on planetary motion. With important applications to physics and to probability and statistics and other branches of mathematics, the subject flourished through the first half of this century. Orthogonal Polynomials are special class of polynomials which are useful in studying various physical and mathematical problems. They occur naturally as solution to many important differential equations arising from physical phenomenon and thus making them an interesting topic. In this thesis I shall aim to cover basics of Orthogonal Polynomials in general and discuss the recent technique to construct differential operator corresponding to a specific class of orthogonal polynomials which have these as eigen functions. Further an example has been illustrated using the theory discussed.

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