Basic orthogonal and periodic functions

Exercise 3

Least-squares Approximation of Functions Using Orthogonal Polynomials

Author
Cesare De Cal

Professor
Annie Cuyt

Assistant Professor
Ferre Knaepkens

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1 Introduction

This exercise asks to compute the Chebyshev approximation

$$t(x) = \sum_{j=0}^{n} a_j T_j(x)$$

for the functions $f(x) = \cos(2x)$ and $f(x) = cos(4x)$ over the interval $[-\pi, \pi]$ for $n = 6$ and then plot the original functions with the approximations and draw conclusions on the results.