Homework #3

Problems:

§4.7 1b,c, 2b,c, 3b, 5.

Find the first 4 monic orthogonal polynomials

\[ p_0(x), p_1(x), p_2(x), p_3(x) \]

for the weighted inner product

\[ \langle f ; g \rangle = \int_0^1 f(x) g(x) x \, dx. \]

Use your polynomials to construct weighted quadrature rules for

\[ \int_0^1 f(x) x \, dx = \sum_{j=0}^{n} \alpha_j f(x_j) \]

of maximal degree of precision using a total of 1 node \( x_0 \), 2 nodes \( x_0, x_1 \), and 3 nodes \( x_0, x_1, x_2 \).

Due: Monday, March 3


First Midterm: Wednesday, March 5, covers chapter 4.

You will be allowed to use one 8” × 11” sheet of notes.

Final Project Proposal: Also due March 5