

## 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

**Text:** Burden and Faires, *Numerical Analysis*, 7-th edition.

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

You will be allowed to use one 8"  $\times$  11" sheet of notes.

**Final Project Proposal:** Also due March 5