Homework for November 8

1. Determine one, two, three, four, and five point quadrature rules (i.e. weights and points) for the domain of integration $[-1,1]$. Thus, for $n = 1, 2, ..., 5$, you will find $\{(x_i, w_i)\}_{i=1}^n$ so that

$$\int_{-1}^{1} p(x)dx = \sum_{i=1}^{n} w_i p(x_i)$$

for all polynomials p of degree $2n-1$.

2. Determine one, two and three point quadrature rules (i.e. weights and points) for the domain of integration $[-2,-1] \cup [1,2]$. Thus, for $n = 1, 2, 3$, you will find $\{(x_i, w_i)\}_{i=1}^n$ so that

$$\int_{-2}^{-1} p(x)dx + \int_{1}^{2} p(x)dx = \sum_{i=1}^{n} w_i p(x_i)$$

for all polynomials p of degree $2n-1$.