Technion – Israel Institute of Technology



HW7

Numerical Methods

019003

|  |  |  |
| --- | --- | --- |
| Alon Spinner | 305184335 | alonspinner@gmail.com |
| Oren Elmakis | 311265516 | orenelmakis@gmail.com |

January 22, 2022

# Question 1 - Gauss-Quadrature with 3 sampled points

Given points to sample from, we will construct a polynomial of degree .

Given an integral in bracket , one can introduce a variable change such that after, values in it will range from

As such, we will only practice on the integral in bracket .

We assume the integral could be written as a sum of weights:

Integrating over the polynomial (left side):

Substituting the polynomial values in the sum (right side):

Comparing left side evaluation to the right-side evaluation:

Comparing Coefficients:

We have a system of equations – 6 equations and 6 variables .

Using MATLAB’s symbolic solver to write a general script for points.  
The results for are as follows:

|  |  |
| --- | --- |
|  |  |
|  |  |
|  |  |