ED4030 - Tutorial 3 (Weighted Residuals)

Computational Portion

1. Use a suitable polynomial trial function set to approximate the function $\phi = 1 + \sin(\pi x/2)$ over the range $0 \leq x \leq 1$. Use

   (a) point collocation and

   (b) Galerkin method

   and investigate numerically the convergence of 5 successive approximations to the given function.

2. An experiment on one-dimensional heat conduction provides the following readings for the temperature at various points:

Distance	0.0	0.2	0.4	0.6	0.8	1.0
Temperature	20	30	50	65	40	30

   Fit a smooth curve to this set of data by using the Galerkin method and any suitable trial function set.