HG3MCE—Computerised Mathematical Techniques in Engineering

Problem Class 4

Exercises for the problem class of 23rd March.

1. Use the Gauss–Seidel method to estimate to 3dp the solution of

$$\begin{pmatrix} 1 & -0.01 & -0.02 & -0.03 \\ 0.01 & 1 & -0.01 & -0.02 \\ 0.02 & 0.01 & 1 & -0.01 \\ 0.03 & 0.02 & 0.01 & 1 \end{pmatrix} \begin{pmatrix} x \\ y \\ z \\ w \end{pmatrix} = \begin{pmatrix} 1 \\ 2 \\ 3 \\ 4 \end{pmatrix},$$

   starting from $x = 1$, $y = 2$, $z = 3$ and $w = 4$.

2 Use the Modified Euler Method with steplength 0.2 to estimate to 3dp the value of y when $x = 1$ if $y' = \sqrt{x-y}$, with initial value $y = 0$ when $x = 0$.