

Assignment #3

Due *Friday, 18 February 2005*.

1. Read sections 2.7 and 2.8 (pages 19–23). Browse section 2.9 but note that we will skip it. The “Thomas algorithm”, at least in any detail, is tangential to our main purpose. MATLAB does an excellent job of solving tridiagonal systems; it has something like the Thomas algorithm built in.

2. Show carefully that if f has a continuous fourth derivative and if $\Delta x > 0$ then there is $\xi \in [x - \Delta x, x + \Delta x]$ so that

$$\frac{f(x + \Delta x) - 2f(x) + f(x - \Delta x))}{\Delta x^2} = \frac{\delta_x^2 f(x)}{\Delta x^2} = f''(x) + \frac{1}{12} f^{(iv)}(\xi) \Delta x^2.$$

3. Exercise 2.3 in MORTON & MAYERS (pages 55-56).

4. Reproduce figure 2.4 in MORTON & MAYERS (page 18).