

Homework 3

Due: Tuesday 10/23/2018.

Reading assignment: Sections 5.1, 5.2, 5.3, 11.1, 11.2 in the textbook.

Homework problems

1. Exercise A3.2. Julia users: a function `linspace` is defined in the VMLS package (see the Julia companion to the textbook).
2. Exercise A3.7. Solve the problem for $b = (1, 1, 1/2, 1/6, 1/24)$. With these values we require that $f(t)$ and the function $\exp(t)$ have the same values and the same first four derivatives at $t = 0$. Plot $f(t)$ on the interval $[-2.5, 2.5]$ and compare with $\exp(t)$.
3. Exercise T8.11. Solve the problem for

$$a_1 = \begin{bmatrix} -10 \\ 10 \\ 10 \end{bmatrix}, \quad a_2 = \begin{bmatrix} 0 \\ 10 \\ 0 \end{bmatrix}, \quad a_3 = \begin{bmatrix} -10 \\ 10 \\ 0 \end{bmatrix}, \quad a_4 = \begin{bmatrix} -20 \\ -10 \\ -10 \end{bmatrix}$$

and

$$\rho_1 = 17.7518, \quad \rho_2 = 9.6417, \quad \rho_3 = 14.3198, \quad \rho_4 = 24.9654.$$

4. Exercise A4.7. Solve the problem for

$$c_1 = \begin{bmatrix} -10 \\ 10 \\ 10 \end{bmatrix}, \quad c_2 = \begin{bmatrix} 0 \\ 10 \\ 0 \end{bmatrix}, \quad c_3 = \begin{bmatrix} -10 \\ 10 \\ 0 \end{bmatrix}, \quad c_4 = \begin{bmatrix} -20 \\ -10 \\ -10 \end{bmatrix}, \quad c_5 = \begin{bmatrix} 0 \\ 10 \\ 20 \end{bmatrix}$$

and

$$\rho_1 = 17.7518, \quad \rho_2 = 9.6417, \quad \rho_3 = 14.3198, \quad \rho_4 = 24.9654, \quad \rho_5 = 22.6544.$$

The first four points and measurements are the same as in the previous problem.

5. Exercise T11.9.
6. Exercise A4.11.
7. Exercise T11.22.
8. Exercise A4.12.