Homework 3

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

Homework problems

1. Exercise T8.8. Solve the problem for $K = 5$ and interpolation conditions

   $$f(1) = 3, \qquad f(2) = 5, \qquad f(3) = 10, \qquad f(4) = -2, \qquad f(5) = -3,$$

   and plot the function $f(t)$. (Use `x = A\b` in MATLAB, Octave, or Julia to solve a square set of linear equations $Ax = b$.)

2. Exercise A4.16. Solve the problem for $m = 4$, $n = 8$,

   $$t_1 = 0, \qquad t_2 = 0.3, \qquad t_3 = 0.6, \qquad t_4 = 1,$$

   $$y_1 = -2, \qquad y_2 = 2, \qquad y_3 = -1, \qquad y_4 = 1,$$

   and $s_1 = s_2 = s_3 = s_4 = 0$. Plot the function $p(t)$.

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

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

4. Exercise A4.13.

5. Exercise A4.15.

6. Exercise A4.9.