

Homework 12
due Monday, May 10

Reading for Lectures 26–28:

- Boyce & DiPrima 7.1, 7.4–7.9
- You might also want to read sections 7.2, 7.3 for a capsule review of matrices, eigenvectors and eigenvalues.

Problems:

- 7.1 Ex. 5; write the system in matrix notation.
- 7.4 Ex. 4, 6
- 7.5 Ex. 6, 29
- 7.6 Ex. 2
- 7.7 Ex. 5
- 7.8 Ex. 1
- 7.9 Ex. 4, 8
- Problem A. Suppose $\mathbf{x}^{(1)}, \dots, \mathbf{x}^{(n)}$ and $\mathbf{y}^{(1)}, \dots, \mathbf{y}^{(n)}$ are two fundamental sets of solutions of the homogeneous first order system of n equations

$$\mathbf{x}'(t) = A(t)\mathbf{x}(t).$$

Since they are bases of the same space, there is a change of basis matrix B such that $[\mathbf{x}^{(1)}, \dots, \mathbf{x}^{(n)}] B = [\mathbf{y}^{(1)}, \dots, \mathbf{y}^{(n)}]$. Express the relationship between the Wronskians of the fundamental systems \mathbf{x} and \mathbf{y} in terms of B . (This solves 7.3, Ex. 3, without using the differential equation satisfied by the Wronskian.)