7 Assignment 6 — Laplace Transform

Before starting work on this assignment, it is **critically important** that the student carefully read Section 1 (titled "General Information"), which starts on page 1 of this document.

7.1 Part A

Regular Problems

◇ 7.1 c **[find Laplace transform by first principles]**
◇ 7.2 b c d e **[find Laplace transform]**
◇ 7.4 a **[find Laplace transform (from graph)]**
◇ 7.5 e **[find Laplace transform]**
◇ 7.6 a b **[initial/final value theorem]**
◇ 7.10 d **[find inverse Laplace transform]**
◇ 7.12 **[find inverse Laplace transform]**

MATLAB Problems

This part of the assignment has no MATLAB problems.

7.2 Part B

Regular Problems

◇ 7.13 a **[system function to differential equation]**
◇ 7.14 a **[differential equation to system function]**
◇ 7.16 a b **[stability analysis]**
◇ 7.17 a b c d **[circuit analysis, stability analysis, step response]**
◇ 7.18 **[inverse systems and system function]**
◇ 7.20 **[communication systems, equalization]**
◇ 7.21 a **[solve differential equation]**
◇ 7.22 a b **[solve differential equation for circuit]**

MATLAB Problems

◇ 7.201 a b **[stability analysis]** [**Hint:** The `roots` function might be helpful.]
◇ 7.202 a b **[impulse/step response]** [**Note:** Appendix D of the textbook has some information on the MATLAB Signal Processing Toolbox (e.g., functions such as `tf`, `impulse`, `step`, etc.). Refer to the section titled "Signal Processing" and its associated subsections.]