

Boyce and DiPrima, Ninth Edition (2009)

Number	Section	Assigned Problems
1	1.3	1, 2, 4–9, 14, 17, 19
2	1.1	1, 2, 7, 9, 11, 14–20
3	2.2	1, 3, 7, 9, 11, 12, 23
4	2.1	13, 14, 16, 22, 23, 31
5	2.4	1–19 odd, 25, 26
6	1.1	21, 22, 23, 24, 25a,b,c
	1.2	7, 8, 11a, 13, 15, 18a, 19a
	2.3	4, 8a, 11, 13, 16, 24, 26
7	3.2	1–11 odd, 16, 17, 24, 25, 27, 28, 38
8	3.4	23, 25, 26, 28
9	3.1	1, 3, 5, 9, 10, 24
10	3.4	1, 2, 11, 12
11	3.3	1, 3, 5, 7, 8, 9, 17, 18, 27
12	3.5	2–10 even, 17, 19–25 odd
13	3.6	1, 3, 5, 6, 12, 21
14	3.7	1, 3, 5, 6, 7, 10, 14, 17, 19, 20, 24
15	7.2	1, 2a,c, 10, 11, 21, 22, 23, 25
16	7.1	2, 4, 5, 6, 17, 18. Write systems in matrix notation.
17	7.4	5, 6a, 7a; A1 on next page.
18	7.3	16, 17
19	7.5	1, 2, 7, 15, 24a,b, 25a,b, 29
20	7.6	1, 2, 3, 9, 10
21	7.9	1, 7
22	6.1	5a,b, 12, 15
23	6.2	1, 3, 6, 8, 10, 11, 15, 18, 21, 23
24	6.3	1, 2, 5, 7, 10, 12, 14, 15, 17, 21, 23; A2 and A3 on next page.
25	6.4	1, 2, 3
26	6.6	3–8, 11, 13, 17, 21, 22a, 23a, 25a

Math 308
Additional Homework Problems

A1. Determine whether

$$\mathbf{x}_1(t) = e^{-t} \begin{pmatrix} 1 \\ 0 \\ -1 \end{pmatrix}, \quad \mathbf{x}_2(t) = e^{-t} \begin{pmatrix} 1 \\ -2 \\ 1 \end{pmatrix}, \quad \mathbf{x}_3(t) = e^{-t} \begin{pmatrix} 0 \\ 2 \\ -2 \end{pmatrix}$$

is a fundamental set of solutions for the DE

$$\mathbf{x}' = \begin{pmatrix} 0 & 1 & 1 \\ 1 & 0 & 1 \\ 1 & 1 & 0 \end{pmatrix} \mathbf{x}.$$

A2. Let

$$h(t) = \begin{cases} 2 - 7t, & \text{if } 3 < t < 5; \\ 0, & \text{elsewhere.} \end{cases}$$

Express $h(t)$ in terms of unit step functions and then, using your expression, compute $\mathcal{L}\{h(t)\}$.

Answer:

$$h(t) = u_3(t)(2 - 7t) - u_5(t)(2 - 7t)$$
$$\mathcal{L}\{h(t)\} = e^{-3s} \left(\frac{-19}{s} - \frac{7}{s^2} \right) - e^{-5s} \left(\frac{-33}{s} - \frac{7}{s^2} \right)$$

A3. Find the inverse Laplace transform of

$$\frac{20e^{-2s}}{s(s^2 + 6s + 20)}.$$

Answer: $u_2(t) \left(1 - e^{-3(t-2)} \cos \sqrt{11}(t-2) - \frac{3}{\sqrt{11}} e^{-3(t-2)} \sin \sqrt{11}(t-2) \right)$