

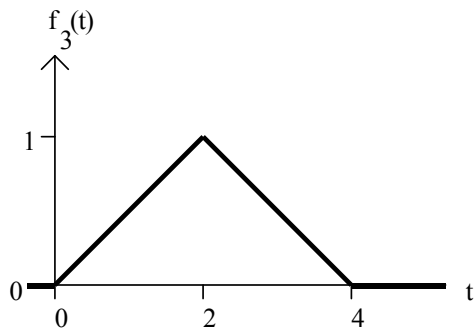
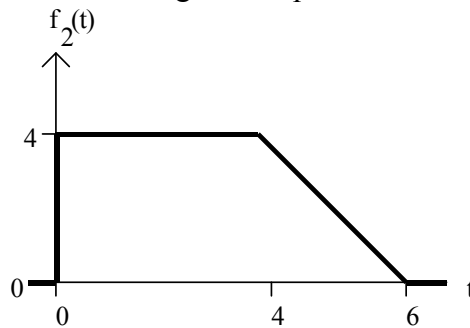
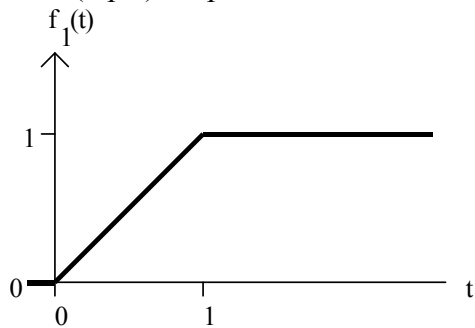
Homework Assignment #10

Reading Assignment:

Chapter 7 in Electric Circuits, 8th Edition by Nilsson

Problem Assignment:

- (82 pts) Ch. 7 problems: 2, 4, 8, 14, 21, 22, 24, 26, 33, 51, 56, 81
- (9 pts) Sketch the following functions:
 - $f_1(t) = u(t) - 2u(t-1) + u(t-2)$
 - $f_2(t) = -u(t+1) + tu(t) + (1-t)u(t-2)$
 - $f_3(t) = -tu(t-2) + (t-1)u(t-3)$
- (9 pts) Express the functions shown below using unit step functions:



Selected Answers:

- 7-4) a) $R = 25 \Omega$ b) $\tau (\text{Tau}) = 12.5 \text{ ms}$ c) $L = 312.5 \text{ mH}$
d) $w(0) = 2.5 \text{ J}$ e) 10.06 ms
- 7-8) $i_L(t) = e^{-100t} \text{ A}, t \geq 0$, $v_o(t) = -15e^{-100t} \text{ V}, t \geq 0$
- 7-14) $R_{\text{Th}} = 0.2 \Omega$, $i_o(t) = 25e^{-4t} \text{ A}, t \geq 0$, $v_o(t) = -5e^{-4t} \text{ V}, t \geq 0$
- 7-22) a) $R = 20 \text{ k}\Omega$ b) $C = 0.05 \mu\text{F}$ c) $\tau (\text{Tau}) = 1 \text{ ms}$
d) $w(0) = 250 \mu\text{J}$ e) $t_o = 804.72 \mu\text{s}$
- 7-26) a) $w_{\text{diss}} = 187.42 \mu\text{J}$ b) $w(0) = 216.75 \mu\text{J}$, $t_o = 3 \text{ ms}$
- 7-56) a) $v_o(t) = -12 + 60e^{-1250t} \text{ V}, t \geq 0$ b) $i_o(t) = 6e^{-1250t} \text{ mA}, t \geq 0$
c) $v_g(t) = -12 + 45e^{-1250t} \text{ V}, t \geq 0$

(continued)

7-81) a) $v_o(t) = 40e^{-100t} [u(t) - u(t - 0.006)] - 18.05e^{-100(t-0.006)} u(t - 0.006)$ V

[b]

