ECE 3337 Summer-3 Hebert, Homework 06 Due Tues 6/28

Problem 1.

(a) Find the FT of $f(t) = (t-1)\left[u(t-1) - u(t-2)\right]$ by evaluating the FT integral.

(b) Find the inverse FT of $G(w) = j4w\left[u(w+2) - u(w-2)\right]$ by evaluating the inverse FT integral.

Problem 2.

(a) Find the inverse Fourier transform of $G(w) = \dfrac{1}{3 - j4w}$

(b) Find the inverse Fourier transform of $G(w) = \dfrac{2\exp(-jw)}{j(w-2)}$ (Use 2 properties of the FT and the FT table)

Problem 3.

Find the inverse Fourier transform of $G(w) = \dfrac{2}{5 + j4\pi(f-7)}$ using the FT table plus properties

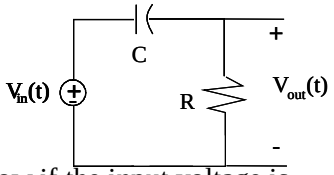
Problem 4.

Find the Fourier transform of $f(t) = 3e^{-(-t-4)}u(-t-1)$ using algebra, the FT table, plus FT properties.

Problem 5.

Find the Fourier transform of $f(t) = 3e^{-(3-j4)t}u(t)$ using algebra, the FT table, plus FT properties

Problem 6. If $v_{in}(t) = 1.5\,\mathrm{sgn}(t)$, R=1 Ω, and C= 0.25 F, find $v_{out}(t)$



Problem 7. Use Fourier transforms to find the output voltage for the circuit below if the input voltage is $v_{in}(t) = 6\,e^{-4t}\,u(t)$