

ELEG 3124 Assignment # 9

- Let $X(\omega) = \frac{1}{2+j\omega}$. Find the Fourier transform of the following functions by using the properties of the Fourier transform
 - $tx(t)$
 - $x\left(\frac{t}{2} - 1\right)$
 - $t\frac{dx(t)}{dt}$
 - $(t - 1)x(t + 1)$
 - $x(2t - 1)\exp(-j2t)$
 - $x(t)\cos(\omega_0 t)$
- Use the properties of Fourier transform, find the Fourier transform of the following signals.
 - $\text{sinc}(t)$
 - $\exp(j\omega_0 t)$
 - $\sin(\omega_0 t)$
- The impulse response of an LTI system is $\exp(-t)u(t)$. If the input is $\exp(-2t)u(t)$, find the output of the system by using Fourier transform.
- Using Parseval's theorem, find the energy of the signal $\text{sinc}(t)$.