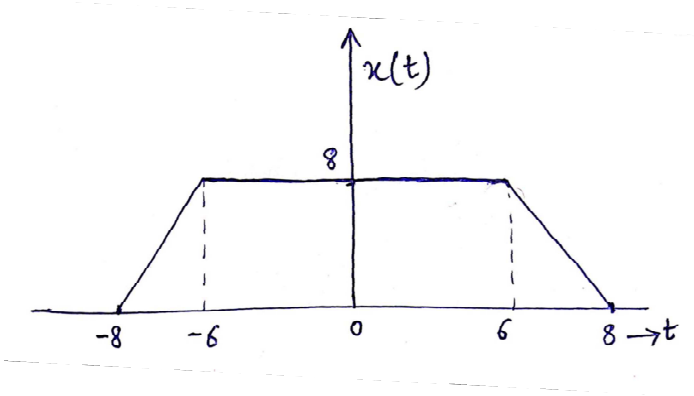
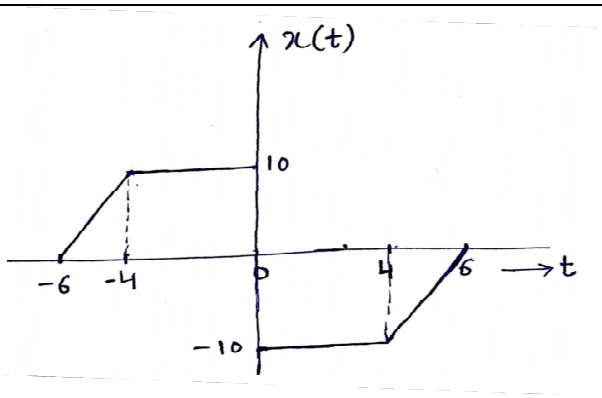
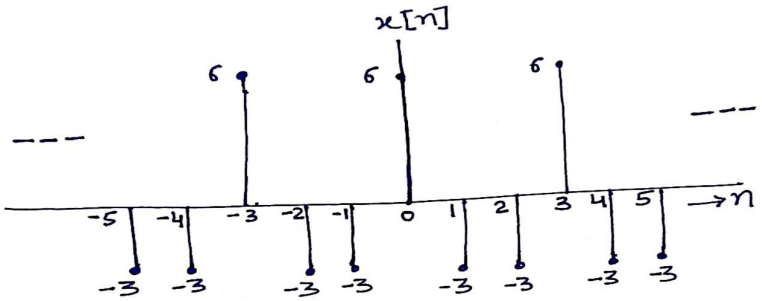
UEC-404 Signals & Systems

Tutorial #5

[1]	Prove that the real part of a conjugate symmetric signal is always even and imaginary part is always odd.
[2]	Prove the following a) $\delta(bt) = \frac{1}{\lvert b \rvert}\delta(t)$ b) $x[n] = \sum_{k=-\infty}^{+\infty} x[k]\delta[n-k]$ c) $r(at) = ar(t)$ only when $a > 0$
[3]	Find the conjugate antisymmetric part of discrete time complex valued $x[n]$ given below: $x[n] = \{-7 + 3j \quad \underset{\uparrow}{1 - 2j} \quad 1 + 5j\}$
[4]	Find the energy of the derivative of the following signal $x(t)$ 
[5]	A signal $f(t)$ is realized by multiplying $x(t)$ with $\delta(t+5) + \delta(t-5)$. Find the integral of $f(t)$ and check whether the resulting signal is energy or power signal.

	
[6]	Express the continuous time signal $x(t)$ given in question **[4]** and **[5]** in terms of unit step and unit ramp signal.
[7]	The energy of a signal $x(t)$ is denoted by E. Find the energy of the signal $x(-at+b)$ in terms of E.
[8]	Check whether $x[n]/x(t)$ is an energy or power signal a) $x[n] = 6\cos\left(\frac{2\pi}{3}n\right)$ b) $x[n] = u[n]$ c) $x(t) = A$
[9]	Find the power of the following signal given below