1) Compute the fourier transform of following signals

(i) $e^{-2(t-1)} u(t-1)$

(ii) $e^{-2|t-1|}$

(iii) $x(t) = \begin{cases} 2, & |t| < T_1 \\ 0, & |t| > T_1 \end{cases}$

2) Find Inverse Fourier transforms of

a) $X(j\omega) = 2\pi \delta(\omega) + \pi \delta(\omega - 4\pi) + \pi \delta(\omega + 4\pi)$

b) $X(j\omega) = \begin{cases} 2, & 0 \leq \omega \leq 2 \\ -2, & -2 \leq \omega \angle 0 \\ 0, & |\omega| > 2 \end{cases}$

3) Compute the fourier transform of following signal

$$x(t) = \frac{2}{1+t^2}$$

4) Prove the Linearity property of Fourier transform.

5) Find fourier transform of following signals using properties of fourier transform

a) $x(t) = \frac{d^2}{dt^2} x(t-1)$

b) $x(t) = x(3t - 6)$

c) $x(t) = x(1-t) + x(-t-1)$