



### TUTORIAL-3

#### Problems under Convolution theorem

1. Find the Fourier transform of  $e^{-|x|}$  and deduce that  $\int_0^{\infty} \frac{\cos xt}{1+t^2} dt = \frac{\pi}{2} e^{-|x|}$
2. Using transform methods, evaluate  $\int_0^{\infty} \frac{dx}{(x^2 + a^2)^2}$
3. Evaluate :  $\int_0^{\infty} \frac{dx}{(x^2 + a^2)(x^2 + b^2)}$  using transforms.