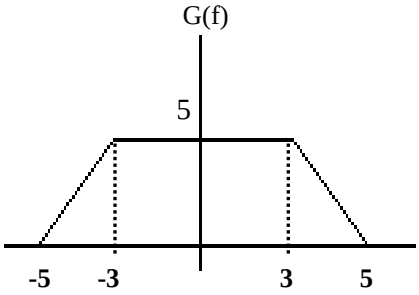
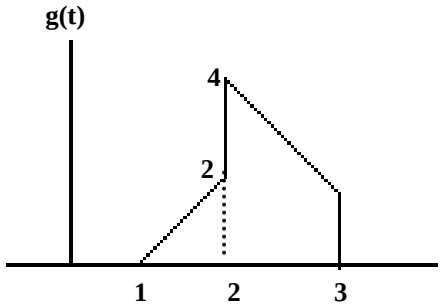
Arab Academy for Science and Technology & Maritime Transport
College of Engineering & Technology
Department : Electronics & Communication
Course : Communication Theory
Course No: EC 321
Lecturer : Communication Staff
GTA : Eng. Sherif Khiray El-Dyasti

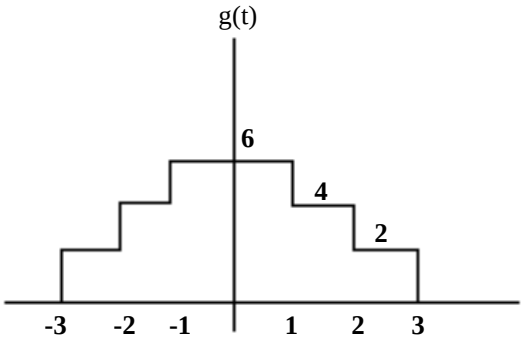
Sheet (4)

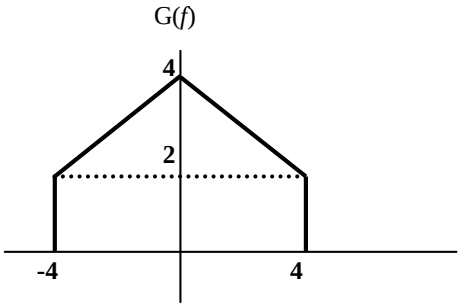
Properities of Fourier Transform (1)

1- Evaluate the FT of the shown signals using linearity property:









2- Find and sketch the spectrum of each signals:

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

$$g(t) = e^{-\mathbf{3}|t-\mathbf{2}|}$$

$$g(t) = rect(t).tri(\frac{t}{\mathbf{2}})$$

$$g(t) = e^{-\mathbf{2}t}\cos(\mathbf{10}\pi t).u(t)$$

$$g(t) = \mathbf{2}.e^{-\mathbf{2}t}.u(t-\mathbf{2})$$

$$g(t) = [u(t) - u(t-\mathbf{5})].\cos(\mathbf{10}.t)$$

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

$$g(t) = e^{-\mathbf{2}t}u(t) + e^{\mathbf{2}t}u(-t)$$

$$g(t) = e^{\mathbf{5}t}\sin(\mathbf{2}\pi t).u(-t)$$

$$g(t) = e^{-(\mathbf{2}t+\mathbf{4})}u(t)$$

3- Sketch the following signals and then prove that $G_{\mathbf{3}}(f) = G_{\mathbf{1}}(f) + G_{\mathbf{2}}(f)$

- $g_{\mathbf{1}}(t) = \mathbf{4}.rect(\frac{t-\mathbf{2}}{\mathbf{4}})$
- $g_{\mathbf{2}}(t) = \mathbf{4}.rect(\frac{t+\mathbf{2}}{\mathbf{4}})$
- $g_{\mathbf{3}}(t) = \mathbf{4}.rect(\frac{t}{\mathbf{8}})$

4- Find the IFT the following signals and sketch its fourier transform:

$$G(f) = 9.\text{sinc}^2[4(f-5)] + 9.\text{sinc}^2[4(f+5)]$$

$$G(f) = \frac{1}{1+\omega^2}$$

$$G(f) = e^{-2f}.u(f+2)$$

$$G(f) = \frac{4}{j(2+j\pi f)}$$

$$G(f) = \mathbf{2}.rect(\frac{f-\mathbf{4}}{\mathbf{2}}).e^{j\mathbf{10}\pi.f}$$

Good Luck