1. **Complex Exponential**

   (a) Let $z_1 = 16e^{-j\frac{2\pi}{3}}$ and $z_2 = 4 - j4\sqrt{3}$

      i. Express $\frac{z_1}{z_2}$ in cartesian form

      ii. Express $\frac{z_1}{z_2}$ in polar form

   (b) Show that

$$1 - e^{j\alpha} = 2\sin(\frac{\alpha}{2})e^{j[\frac{(\alpha-\pi)}{2}]}$$

2. **Energy and Power of Signals**

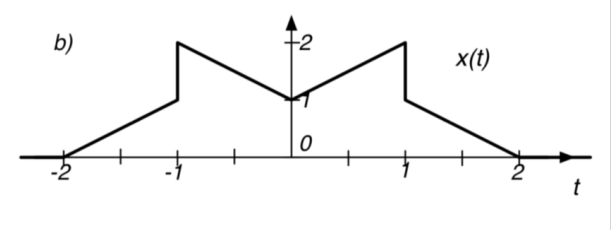
   Find the energy and power of

$$y(t) = e^{-ct}$$

   where $c = a + jb$. *Note: a and b are real valued*

3. **Expression for Signals**

   Write the signal as a combination (sums or products) of scaled and shifted unit triangles $\Delta(t)$ and unit rectangles rect(t).

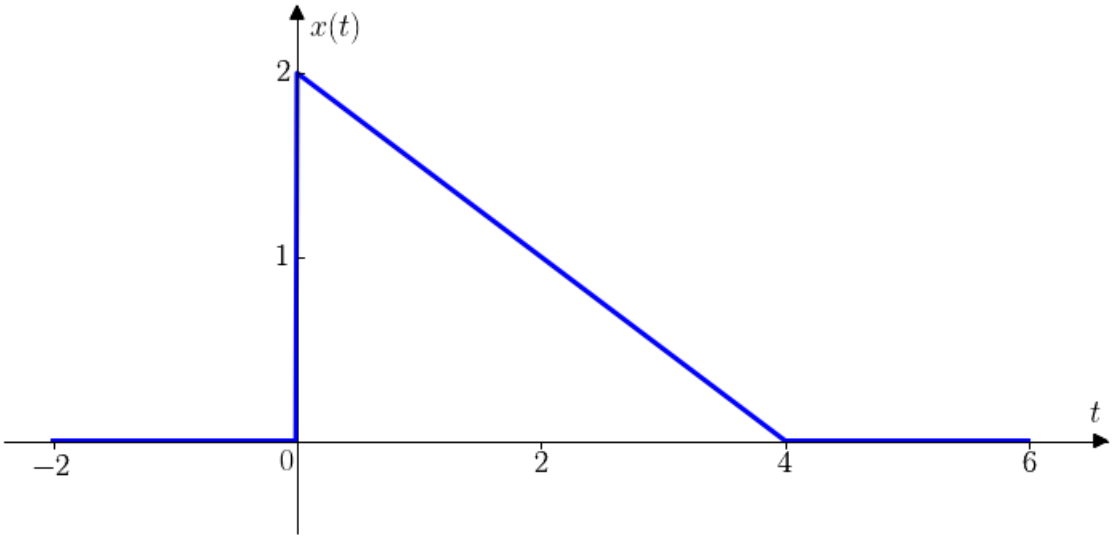


4. **Elementary signals.**

   (a) Consider the signal $x(t)$ shown below. Sketch the following:

      i. $y(t) = x(t)\,(u(t-1) - u(2t-5))$

      ii. $y(t) = \int_{-\infty}^{t} \delta(\tau - 2)x(\tau)d\tau$



(b) Evaluate the integral:

$$y(t) = \int_{-\infty}^{\infty} f(\tau)\delta(t-\tau)\delta(t-2)d\tau$$