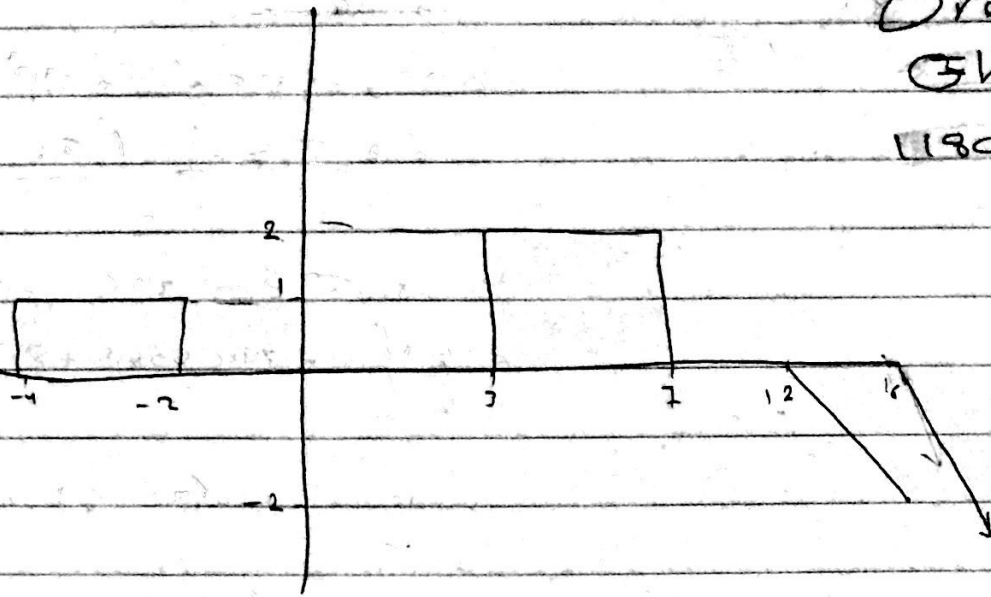
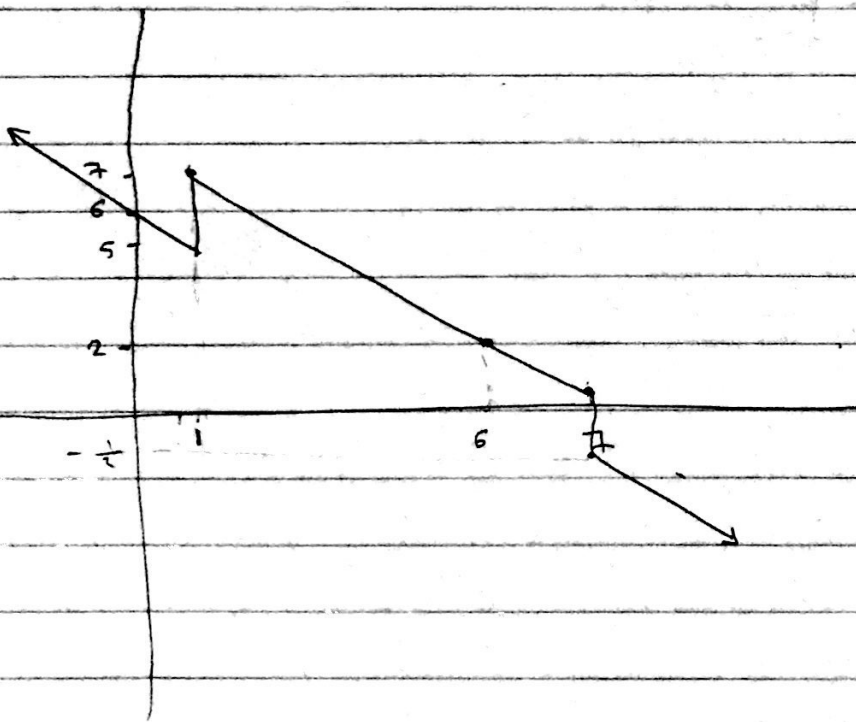


$$P1: x(t) = 2\pi \left( \frac{t-4}{2} \right) + \pi \left( \frac{t+3}{2} \right) - r \left( \frac{t-12}{2} \right) + 2u(t-16)$$

Orouba  
Ghann  
1190881



$$x(t) = 2\pi \left( \frac{t-4}{2} \right) - r \left( \frac{t-6}{2} \right) + r(-t+6)$$



P2:  $\int_{-\pi}^{\pi} x(t) \delta(t - \frac{\pi}{2}) dt$

$$= (-1)^n x(\frac{\pi}{2}) \Big|_{t=\frac{\pi}{2}}$$

$$x(t) = 10 \sin(2(\pi t - \frac{\pi}{2}))$$

$$x(t) = 10 \times 2 \pi \sin(\frac{\pi t + \frac{\pi}{2}}{2}) \cdot \cos(\frac{\pi t + \frac{\pi}{2}}{2})$$

$$= 20\pi \sin[2(\pi t + \frac{\pi}{2})]$$

$$= 10 \pi \sin(2\pi t + \pi)$$

$$= 10 \pi [\sin 2\pi t \cos \pi + \sin \pi \cos 2\pi t]$$

zero

$$= 10 \pi \sin(2\pi t)$$



$$= (-1) * (10) \pi \sin \pi t \Big|_{t=\frac{\pi}{2}}$$

$$= 10 \pi \sin(2\pi \frac{\pi}{2})$$

$$= 10 \pi \sin(\pi^2)$$

$$= -4.3 \pi$$

Q 3:

$$x(t) = 5 \sin(10\pi t) \cdot \Pi\left(-5\left(t - \frac{1}{2}\right)\right) + 4 e^{2t} \Pi\left(\frac{t-5}{4}\right)$$

Center =  $\frac{1}{2} \pm \frac{1}{10}$

Center = 5

$\frac{3}{5} \quad \frac{7}{5}$

~~lim~~  $\lim_{T \rightarrow \infty} \int_{-\frac{T}{5}}^{\frac{T}{5}} 0 dt + \int_{\frac{3}{5}}^{\frac{7}{5}} (5 \sin(10\pi t))^2 dt + \int_{\frac{3}{5}}^{\frac{7}{5}} 0 dt$

$+ \int_3^7 (4 e^{2t})^2 dt$

$= \lim_{T \rightarrow \infty} \left[ 25 \left[ \frac{t}{2} - \frac{\sin(2 \times 10\pi t)}{4 \times 10\pi} \right] \Big|_{\frac{3}{5}}^{\frac{7}{5}} + \frac{16 e^{4t}}{4} \Big|_3^7 \right]$

$= 25 \left[ \left( \frac{7}{5 \times 2} - \frac{\sin(20\pi \frac{7}{5})}{40\pi} \right) - \left( \frac{3}{5 \times 2} - \frac{\sin(20\pi \frac{3}{5})}{40\pi} \right) \right]$

$+ 4 e^{4 \times 7} - 4 e^{4 \times 3}$

$\lim_{T \rightarrow \infty} (7.3 - 4.9) + 4 e^{28} - 4 e^{12}$

$2.46 + 5.78 \times 10^{12}$

Energy

$P = \lim_{T \rightarrow \infty} \frac{E}{2T} = \lim_{T \rightarrow \infty} \frac{\quad}{2T} = 0 \quad \#$

Q 40  $x(t) = \cos\left(\frac{50\pi}{w_1} t\right) + 20 \sin\left(\frac{19t}{w_2}\right)$

$w_1 = 2\pi f_1$

$w_2 = 2\pi f_2$

$f_1 = 25$

$f_2 = \frac{19}{2}$

$f_1 = w_1 / 2\pi$

$f_2 = w_2 / 2\pi$

$\frac{f_2}{f_1} = \frac{w_2}{w_1} \Rightarrow \frac{19}{2} \times \frac{1}{25\pi} = \text{irrational number} \rightarrow \text{aperiodic}$

Q 21  $x(t) = \cos(50\pi t) + 20 \sin(19t)$

$x(t) = \cos(50\pi t) + 20 \sin\left(19t - \frac{\pi}{2}\right)$

