

For the signal, $x(t) = -1 + 2\cos(4t) + \frac{1}{2}\sin(8t) + \cos(7t)$, calculate:

a) the period

$$T_1 = \frac{2\pi}{4}, T_2 = \frac{2\pi}{8} \Rightarrow \frac{T_1}{T_2} = 2 \therefore \text{periodic with period } T_{12} = T_1 = \frac{\pi}{2} [s]$$

$$T_3 = \frac{2\pi}{7} \Rightarrow \frac{T_{12}}{T_3} = \frac{7}{4} \therefore T = 4 \times T_{12} = 7 \times T_3 = 4 \times \frac{\pi}{2} = 2\pi = 6.28 [s]$$

$$T = \underline{\quad 6.28 [s] \quad}$$

b) the power and energy

Periodic, power signal $\Rightarrow E_x = \infty$

$$P = \underline{\quad \frac{|-1|^2}{2} + \frac{|2|^2}{2} + \frac{|1/2|^2}{2} + \frac{|1|^2}{2} = \frac{29}{8} \quad}$$

$$E = \underline{\quad \infty \quad}$$