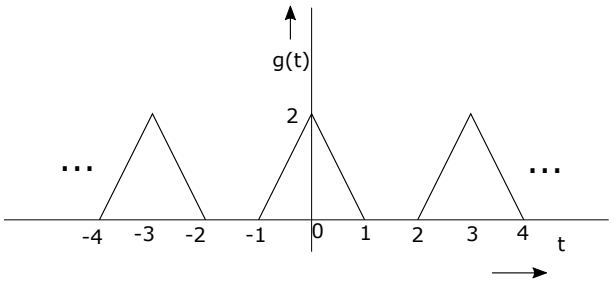
EE 496 Participation Quiz 1 (Group) Fall 2025

1. A periodic signal $g(t)$ is shown below.



(a) Calculate the average power of $g(t)$. Note that its period is 3 seconds. (worth 5 points)

(b) Sketch $g(2t-1)$. Label the axes appropriately. (worth 5 points)

$$P = \frac{1}{T_0}\int_{T_0} |g(t)|^2\,dt \qquad g(t) = \begin{cases} 2t, & -1 < t < 0 \\ -2t, & 0 < t < 1 \end{cases}$$

$$= \frac{1}{3}\left(\int_{-1}^{0} |2t|^2\,dt + \int_{0}^{1} |-2t|^2\,dt\right)$$

$$= \frac{1}{3}\left(\int_{-1}^{0} 4t^2\,dt + \int_{0}^{1} 4t^2\,dt\right)$$

$$\frac{4}{3}t^3\Big|_{-1}^{0} + \frac{4}{3}t^3\Big|_{0}^{1}$$

$$\frac{1}{3}\left(\frac{4}{3} + \frac{4}{3}\right)$$

$$P_{avg} = \frac{8}{9}\ \text{Watts}$$

b) $g(2t-1) = g(2(t-1/2))$