Ficha 6: Exercício 4a

$f(t) = sen^2 t \quad -\pi < t < \pi$

Como $f(t)$ é par, temos que $b_n = 0$.

$$a_0 = \frac{1}{\pi}\int_{-\pi}^{\pi} sen^2\, t\, dt = \frac{1}{\pi}\int_{-\pi}^{\pi} \frac{1-\cos 2t}{2} dt$$

$$a_0 = \frac{1}{2\pi}\left(t|_{-\pi}^{\pi} - \int_{-\pi}^{\pi} \cos 2t\, dt \right) = 1$$

=0 (1ª I.E.)

$$a_n = \frac{1}{\pi}\int_{-\pi}^{\pi} sen^2\, t \cos nt\, dt = \frac{1}{\pi}\int_{-\pi}^{\pi} \frac{1-\cos 2t}{2} \cos nt\, dt$$

$$a_n = \frac{1}{2\pi}\left(\int_{-\pi}^{\pi} \cos nt\, dt - \int_{-\pi}^{\pi} \cos 2t \cos nt\, dt \right)$$

=0 (1ª I.E.)

$$a_n = \begin{cases} 0, & se\ n \neq 2 \\ -\frac{1}{2}, & se\ n = 2 \end{cases}$$

$$f(t) = \frac{1}{2} - \frac{1}{2}\cos 2t$$