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$W_0 = 2\pi f$

$W_0 = 2\pi \cdot \frac{1}{2\pi}$

$W_0 = 1$

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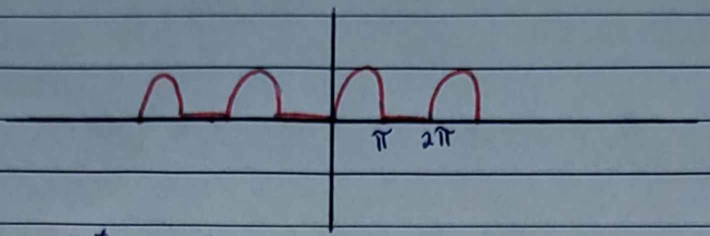
$T = 2\pi$



$$a0 = \frac{1}{T}\int_0^t f(t)\,dt$$

$$a0 = \frac{1}{2\pi}\int_0^\pi \text{sen}\, t . dt$$

$$a0 = \frac{1}{2\pi}\Big[-\cos t\Big]_0^\pi$$

$$a0 = \frac{1}{2\pi}\Big((-\cos\pi)-(-\cos 0)\Big) = \frac{1}{2\pi}\Big(1-(-1)\Big) = \frac{1}{2\pi}\cdot 2$$

$$a0 = \frac{2}{2\pi} = \frac{1}{\pi}$$

$$an = \frac{2}{T}\int_0^T f(t)\cos(nt)\,dt$$

$$an = \frac{2}{2\pi}\int_0^\pi \text{sen}\, t . \cos nt\, dt$$

$$an = \frac{2}{2\pi}\cdot -\left[\frac{\cos(1-n)t}{2(1-n)} + \frac{\cos(1+n)t}{2(1+n)}\right]_0^\pi$$

$$an = \frac{-2}{4\pi}\cdot\left[\frac{\cos(t-nt)}{(1-n)} + \frac{\cos(t+nt)}{(1+n)}\right]_0^\pi$$

$$an = -\frac{1}{2\pi}\left[\frac{\cos(\pi-n\pi)}{(1-n)} + \frac{\cos(\pi+n\pi)}{(1+n)}\right] - \left[\frac{\overset{1}{\cos(0-n.0)}}{(1-n)} + \frac{\overset{1}{\cos(0-n.0)}}{(1+n)}\right]$$

$$a_n = \frac{-1}{2\pi}\left\{\left[\frac{\cos(\pi - n\pi)}{(1-n)} + \frac{\cos(\pi + n\pi)}{(1+n)}\right] - \left[\frac{1}{1-n} + \frac{1}{1+n}\right]\right\}$$

$$b_n = \frac{2}{T}\int_0^T f(t)\ \text{sen}(nt)$$

$$b_n = \frac{2}{2\pi}\int_0^{\pi} \text{sen}(t)\cdot\text{sen}(nt)$$

$$b_n = \frac{2}{2\pi}\left[\frac{\text{sen}(1-n)t}{2.(1-n)} - \frac{\text{sen}(1+n)t}{2.(1+n)}\right]_0^{\pi}$$

$$b_n = \frac{1}{2\pi}\left[\frac{\overset{0}{\cancel{\text{sen}(\pi - n\pi)}}}{1-n} - \frac{\overset{0}{\cancel{\text{sen}(\pi + n\pi)}}}{1+n}\right] - \left[\frac{\overset{0}{\cancel{\text{sen}(0-n0)}}}{1-n} - \frac{\overset{0}{\cancel{\text{sen}(0+n0)}}}{1+n}\right]$$

$$b_n = 0$$

$$f(t) = a_0 + \sum_{n=1}^{\infty}\left(a_n\cos\left(\frac{2\pi n t}{T}\right) + b_n\,\text{sen}\left(\frac{2\pi n t}{T}\right)\right)$$

$$f(t) = \frac{1}{\pi} + \sum_{1}^{\infty}\left[\frac{-1}{2\pi}\left(\frac{\cos(\pi - n\pi)}{1-n} + \frac{\cos(\pi + n\pi)}{1+n}\right) - \left(\frac{1}{1-n} + \frac{1}{1+n}\right)\right]\cdot\cos nt$$

$$b_1 = \frac{2}{2\pi}\int_0^{\pi}\text{sen}(1)\cdot\text{sen}(1)$$

$$b_1 = \frac{1}{\pi}\left[\frac{t}{2} - \frac{\text{sen}\,t}{4}\right]_0^{\pi} = \frac{1}{2}$$

$$a_1 = 0$$