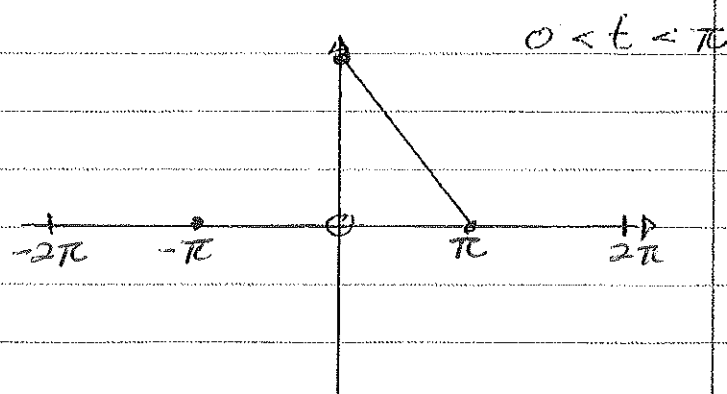




Question 2

$$f(t) = \pi - t$$



$$b_n = 0$$

$$a_0 = 2 \left(\frac{1}{\pi} \int_0^{\pi} (\pi - t) dt \right)$$

$$= \frac{2}{\pi} \left[\pi t - \frac{t^2}{2} \right]_0^{\pi}$$

$$= 2\pi - \pi$$

$$= \pi$$

$$a_n = \frac{2}{\pi} \int_0^{\pi} (\pi - t) \cos nt \, dt$$

$$= 2 \int_0^{\pi} \cos nt \, dt = \frac{2}{\pi} \int_0^{\pi} t \cos nt \, dt$$

$$= \frac{2 \sin nt}{n} \Big|_0^{\pi} - \frac{2}{\pi} \left[\frac{\cos nt}{n^2} + \frac{t \sin nt}{n} \right]_0^{\pi}$$

$$= 0 - \frac{2}{\pi} \left[\frac{(-1)^n}{n^2} - \frac{1}{n^2} \right]$$

$$= -\frac{2}{n^2 \pi} [(-1)^n - 1]$$

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