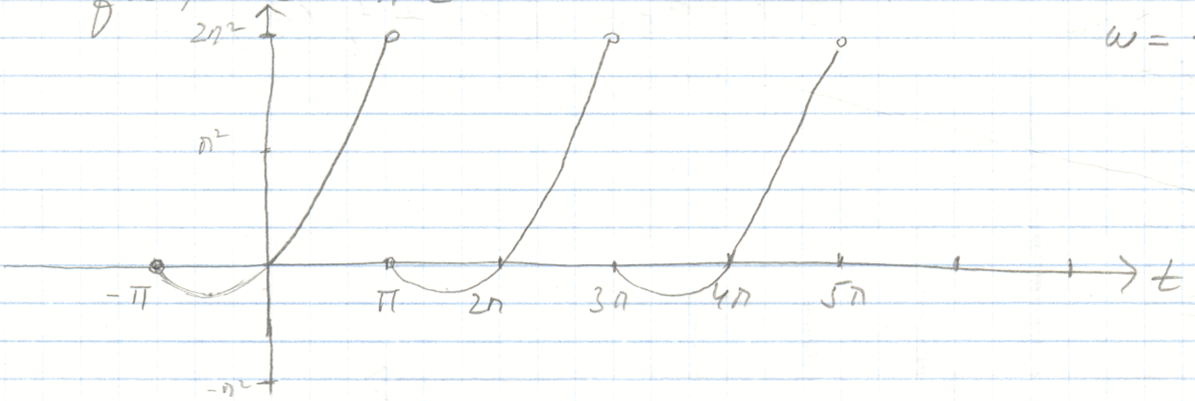
s. 717 opg 3

TI:89 $b_{1,2,3,4,5}=\int(f(t)\cos n\omega t,\ t,\ -T/2,\ T/2)\ |\ n=\{1,2,3,4,5\}$

$f(t)=t^2+\pi t \qquad -\pi<t<\pi \qquad T=2\pi,\ \omega=1$



$$a_0=\frac{2}{2\pi}\int_{-\pi}^{\pi}(t^2+\pi t)\,dt=\frac{1}{\pi}\left[\frac{t^3}{3}+\pi\frac{t^2}{2}\right]_{-\pi}^{\pi}=\frac{1}{\pi}\left[\frac{\pi^3}{3}+\frac{\pi^3}{2}+\frac{\pi^3}{3}-\frac{\pi^3}{2}\right]$$

$$a_0=\frac{2\pi^2}{3}$$

$$a_n=\frac{2}{2\pi}\int_{-\pi}^{\pi}(t^2+\pi t)\cdot\cos nt\,dt=\frac{2\cdot(2n\cos(n\pi)\cdot\pi+(n^2\pi^2-2)\sin}{n^3\pi}$$

$$a_n=\frac{4(-1)^n}{n^2}$$

$$b_n=\frac{2}{2\pi}\int_{-\pi}^{\pi}(t^2+\pi t)\cdot\sin nt\,dt=\frac{-2(n\cdot\cos(n\pi)\cdot\pi-\sin(n\pi))}{n^2}$$

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

$$f(t)=\frac{\pi^2}{3}+\sum_{n=1}^{\infty}\frac{4(-1)^n}{n^2}\cos nt-\frac{2\pi(-1)^n}{n}\sin nt$$

$$f(t)=\frac{\pi^2}{3}-4\cos t+2\pi\sin t+\cos 2t-\pi\sin 2t$$
$$-\frac{4}{9}\cos 3t+\frac{2\pi}{3}\sin 3t+\frac{1}{4}\cos 4t-\frac{\pi}{2}\sin 4t+\dots$$