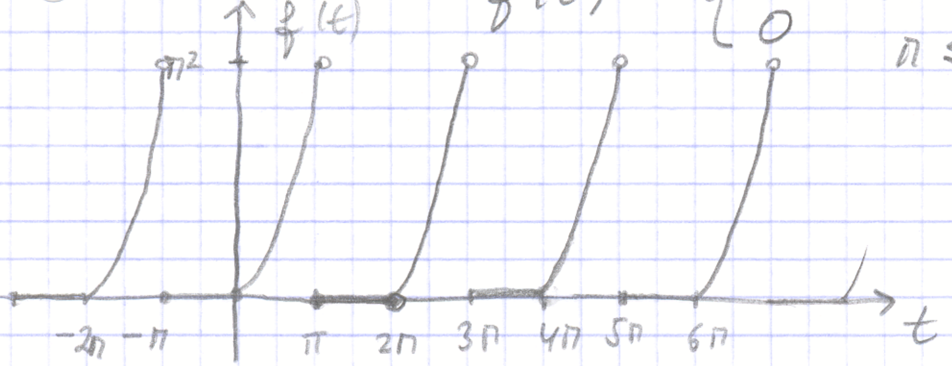
B: s. 717 opg 6

$T = 2\pi$ $\quad f(t) = \begin{cases} t^2 & 0 \le t < \pi \\ 0 & \pi \le t < 2\pi \end{cases}$



$$a_0 = \frac{2}{T}\int_0^{\pi} t^2\,dt = \frac{1}{\pi}\left[\frac{1}{3}t^3\right]_0^{\pi} = \underline{\underline{\frac{\pi^2}{3}}}$$

$$a_n = \frac{1}{\pi}\int_0^{\pi} t^2 \cos nt\,dt \overset{TI\text{-}89}{=} \frac{2n\cos(n\pi)\cdot\pi + (n^2\pi^2-2)\sin(n\pi)}{n^3\pi}$$

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

$$b_n = \frac{1}{\pi}\int_0^{\pi} t^2 \sin nt\,dt \overset{\pi\text{-}89}{=} \frac{-((n^2\pi^2-2)\cos(n\pi) - 2(n\sin(n\pi))\ldots}{n^3\pi}$$

$$b_n = \frac{(2-n^2\pi^2)(-1)^n - 2}{n^3\pi}$$

$$f(t) = \frac{\pi^2}{6} + \sum_{n=1}^{\infty}\left(\frac{2(-1)^n}{n^2}\cos nt + \frac{(2-n^2\pi^2)(-1)^n-2}{n^3\pi}\sin nt\right)$$

eller

$$f(t) = \frac{\pi^2}{6} - 2\cos t + \frac{\pi^2-4}{\pi}\sin t + \frac{1}{2}\cos 2t - \frac{\pi}{2}\sin 2t$$
$$- \frac{2}{9}\cos 3t + \frac{9\pi^2-4}{27\pi}\sin 3t + \frac{1}{8}\cos 4t - \frac{\pi}{4}\sin 4t + \ldots$$

s. 717 $\boxed{\text{opg } 7}$

$f(t) = 2\sin t \quad 0 < t < 2\pi \qquad T = 2\pi$

f(t) er i sig selv en Fourierrække repræsentation for 2sint.
Hvis man regner på koeff. fås: $a_0 = \frac{1}{\pi}\int_0^{2\pi} 2\sin t\,dt = \frac{1}{\pi}\left[-2\cos t\right]_0^{2\pi} = \underline{0}$
Da funkt. er ulige er alle $a_n = 0$.

$\boxed{f(t) = 2\sin t}$ $b_n = \frac{1}{\pi}\int_0^{2\pi} 2\sin t \sin nt\,dt \overset{\pi\text{-}89}{=} \frac{1}{n-1} - \frac{1}{n+1}\sin(2n\pi) = 0, \ \forall n \ne 1$

$b_1 = \int_0 2\sin t \sin t\,dt = \underline{2}$