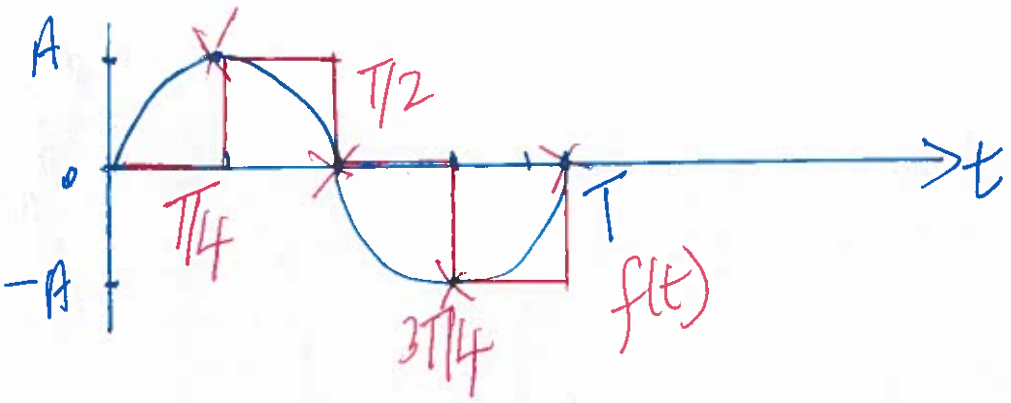

$$f(t) = a_0 + \sum_{n=1}^{\infty} \left[a_n \cos\frac{2\pi n t}{T} + b_n \sin\frac{2\pi n t}{T} \right]$$

$$a_n = \frac{2}{T} \int_0^T f(t) \cos 2\pi f_n t \, dt$$

$$= \frac{2}{T} \left\{ \int_{T/4}^{T/2} A \cos 2\pi f_n t \, dt + \int_{3T/4}^{T} -A \cos 2\pi f_n t \, dt \right\}$$

$$= \frac{2A}{T} \left\{ \left[\frac{1}{2\pi f_n} \sin 2\pi f_n t \right]_{T/4}^{T/2} - \left[\frac{1}{2\pi f_n} \sin 2\pi f_n t \right]_{\frac{3T}{4}}^{T} \right\}$$

$$= \frac{2A}{T} \cdot \frac{T}{2\pi n} \left\{ \left[\sin\frac{2\pi n}{T} \cdot \frac{T}{2} - \sin\frac{2\pi n}{T} \cdot \frac{T}{2 \cdot 4} \right] - \left[\sin\frac{2\pi n}{T} \cdot T - \sin\frac{2\pi n}{T} \cdot \frac{3T}{2 \cdot 4} \right] \right\}$$

$$= \frac{A}{n\pi} \left\{ \underbrace{\sin n\pi}_{=0} - \sin\frac{n\pi}{2} - \underbrace{\sin 2n\pi}_{=0} + \sin\frac{3n\pi}{2} \right\}$$

$$a_n = \frac{A}{n\pi}\left\{\sin\frac{3n\pi}{2} - \sin\frac{n\pi}{2}\right\}$$

$n=1$

$$a_n = \frac{A}{\pi}\left\{\sin\frac{3\pi}{2} - \sin\frac{\pi}{2}\right\} = \frac{A}{\pi}\{-1-1\} = \frac{-2A}{\pi}$$

$n=2$

$$a_n = \frac{A}{2\pi}\{\sin 3\pi - \sin\pi\} = 0$$

$n=3$

$$a_3 = \frac{A}{3\pi}\left\{\sin\frac{9\pi}{2} - \sin\frac{3\pi}{2}\right\} = \frac{A}{3\pi}\left[1-(-1)\right]$$

$$= \frac{2A}{3\pi}$$

$n=5$

$$a_5 = \frac{A}{5\pi}\left\{\sin\frac{15\pi}{2} - \sin\frac{5\pi}{2}\right\} = \frac{A}{5\pi}\left[(-1)-(1)\right]$$

$$= -\frac{2A}{5\pi}$$

a_n only exists for n odd.

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