Sec. 1.9 2

$$A(\lambda) = \frac{1}{\pi}\int_{-\infty}^{\infty} f(x)\cos(\lambda x)dx = \frac{1}{\pi}\int_{t-h}^{t+h}\cos(\lambda x)dx = \frac{\sin(\lambda(t+h) - \sin((t-h))}{\pi}$$

$$B(\lambda) = \frac{1}{\pi}\int_{-\infty}^{\infty} f(x)\sin(\lambda x)dx = \frac{1}{\pi}\int_{t-h}^{t+h}\sin(\lambda x)dx = \frac{\cos(\lambda(t-h) - \cos((t+h))}{\pi}$$

So

$$f(x) = \int_{-\infty}^{\infty} A(\lambda)\cos(\lambda x) + B(\lambda)\sin(\lambda x)dx$$

Sec 1.11 2 First of all,

$$\frac{t}{4\pi} \sim 0.5 + \sum_{n=1}^{\infty} -\frac{\sin(\frac{n}{2}nt)}{n\pi}$$

Let

$$u(t) = A_0 + \sum_{n=1}^{\infty} A_n\cos(nt/2) + B_n\sin(nt/2),$$

Then by matching the coeffiecient, we get

$$A_0 = \frac{1}{2.08} A_n = \frac{0.4\pi}{(1.04-n^2)^2 + (0.4n)^2} B_n = \frac{-1}{n\pi}\frac{1.04-n^2}{(1.04-n^2)^2+(0.4n)^2} \quad (1)$$