



정보통신 수학 및 실습 Homework



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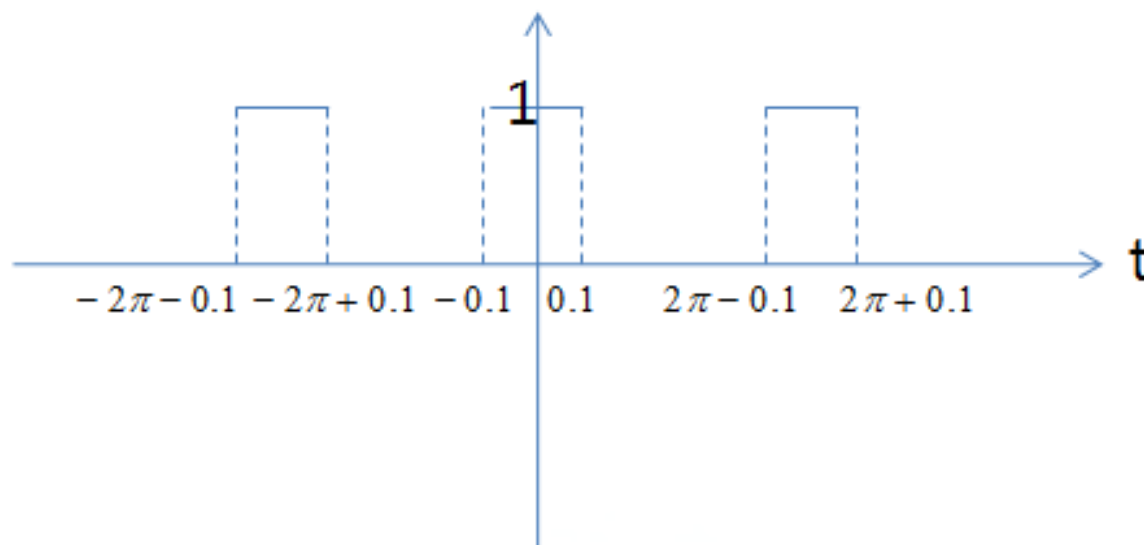
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날짜 : 2017년 5월 24일

Chapter 10 Homework

1. Find the Fourier series of the following functions.

a.



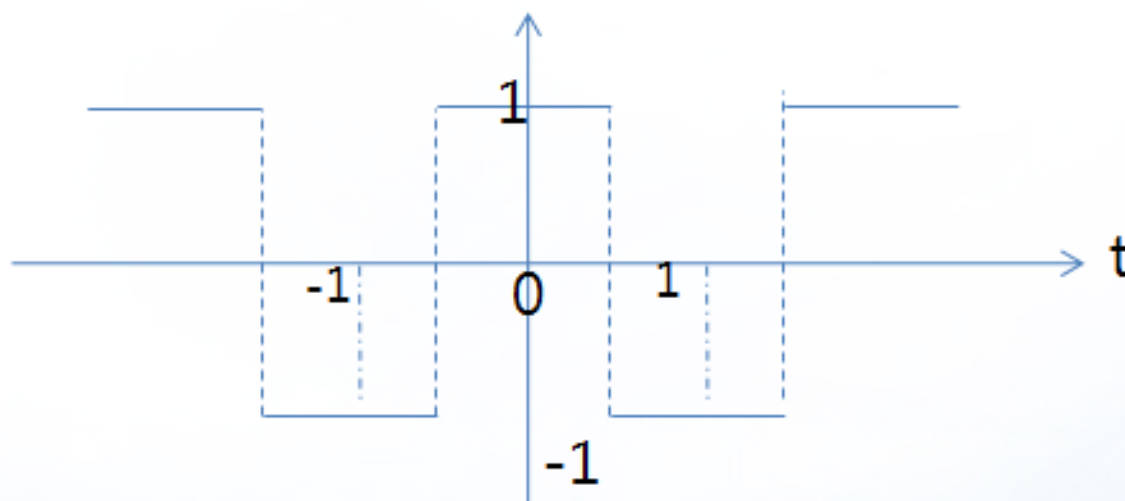
even function

$$f(t) = a_0 + b_1 \cos t + b_2 \cos 2t + \dots$$

$$a_0 = \int_{-\pi}^{\pi} f(t) dt = 0.2$$

$$b_n = \int_{-\pi}^{\pi} f(t) \cos(nt) dt = \int_{-0.1}^{0.1} \cos(nt) dt = \left[\frac{1}{n} \sin(nt) \right]_{-0.1}^{0.1} = \frac{2}{n} \sin(0.1n)$$

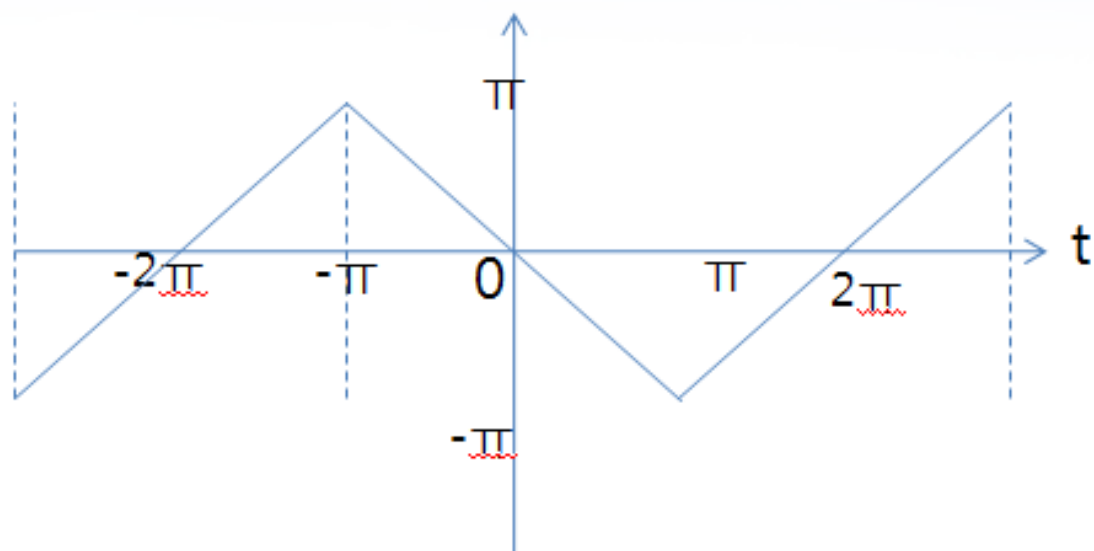
b.



$$f(t) = a_0 + b_1 \cos \pi t + b_2 \cos 2\pi t + \dots$$

$$a_0 = \int_{-1}^1 f(t) dt = 0;$$

c.



d.

$$f(x) = \begin{cases} 0 & \text{if } -\pi \leq x < 0 \\ \cos x & \text{if } 0 \leq x < \pi \end{cases}$$

$$f(x + 2\pi) = f(x)$$