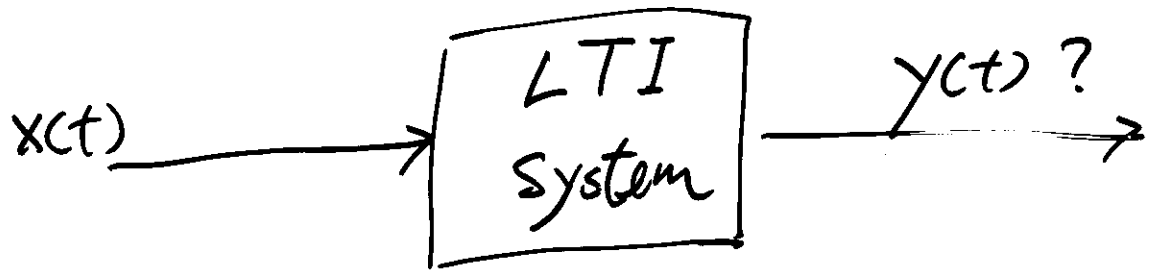
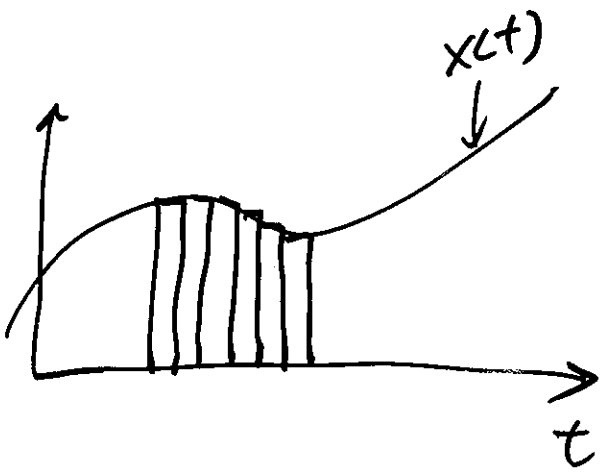
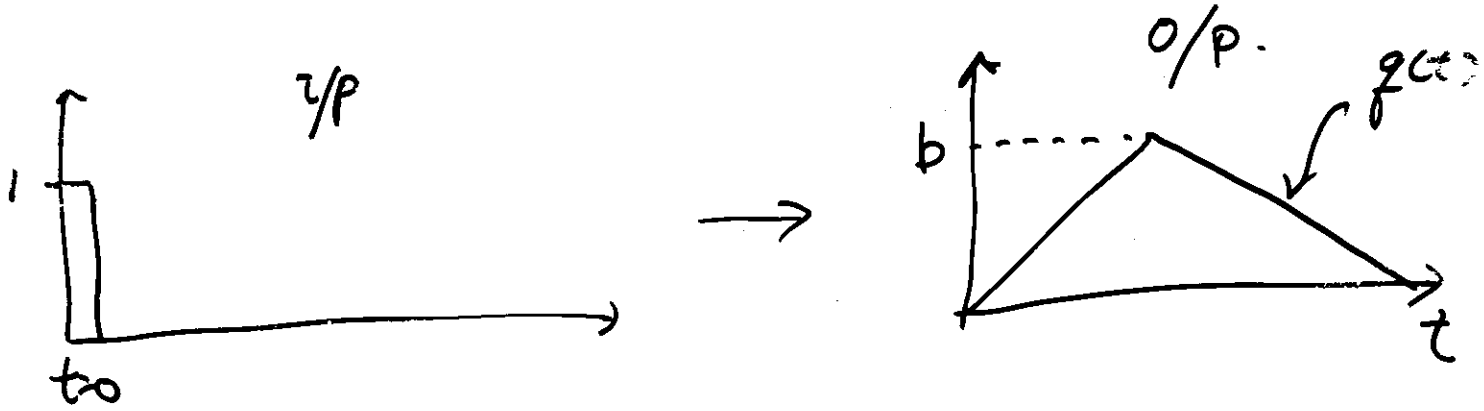
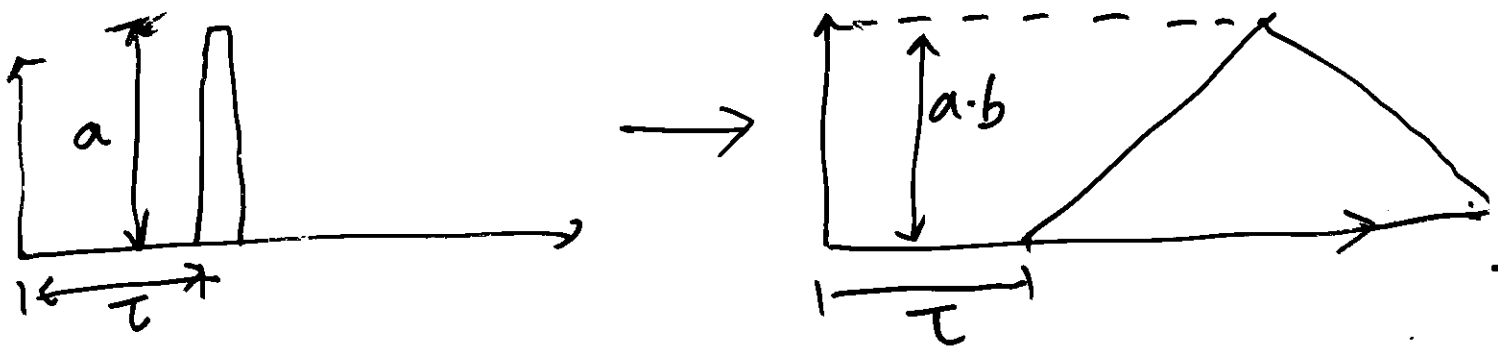

x(t)
LTI
System
y(t) ?


x(t)
t


I/P
1
t=0
O/P.
b
g(t)
t


a
τ
a·b
τ

$$2\cos nx\cos mx = \cos(n+m)x + \cos(n-m)x$$

$$2\sin nx\sin mx = \cos(n-m)x - \cos(n+m)x$$

$$2\sin nx\cos mx = \sin(n+m)x + \sin(n-m)x.$$

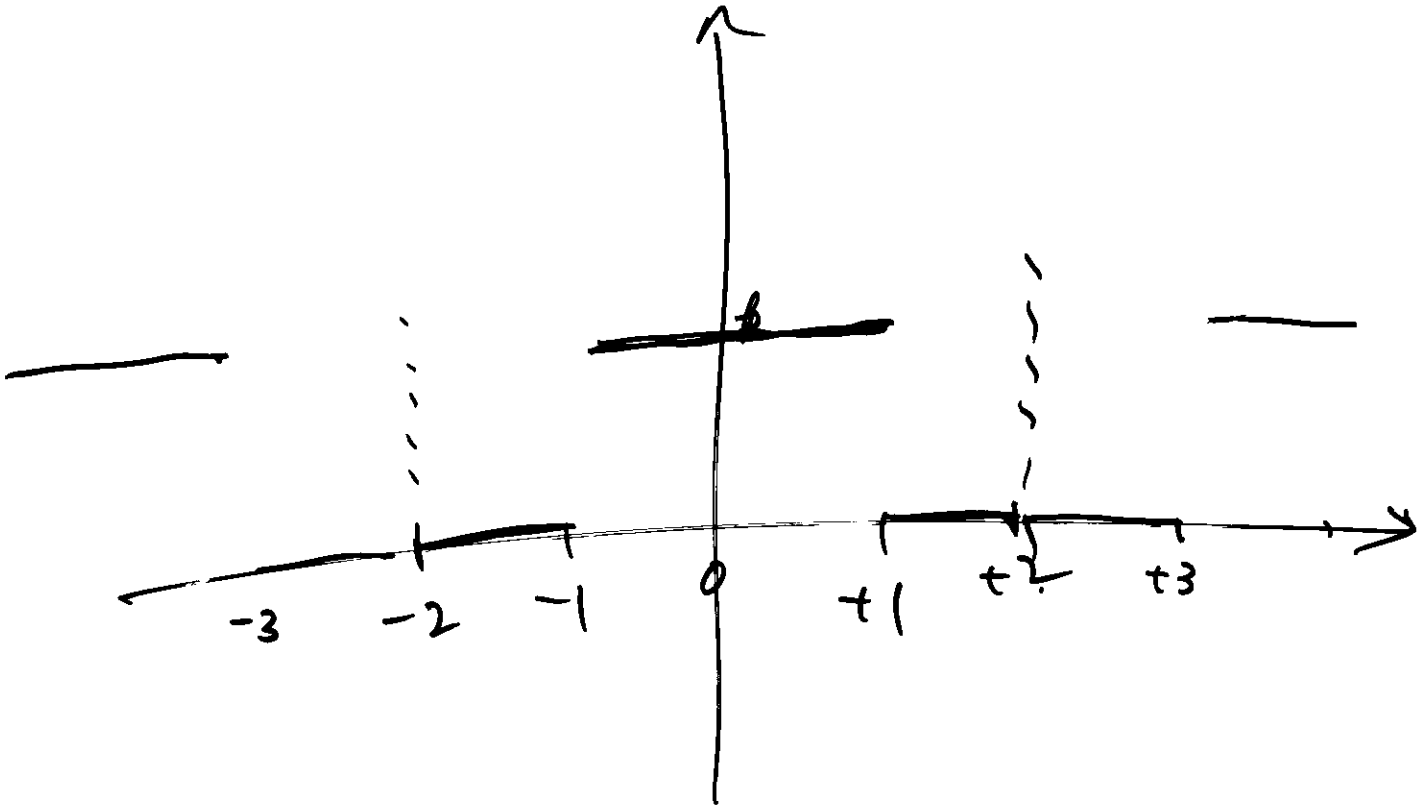
$$e^{i\theta} = \cos\theta + i\sin\theta$$

$$e^{inx} = \cos nx + i\sin nx.$$

$$e^{-inx} = \cos nx - i\sin nx$$

$$\Rightarrow \cos nx = \frac{1}{2}\left[e^{inx} + e^{-inx}\right]$$

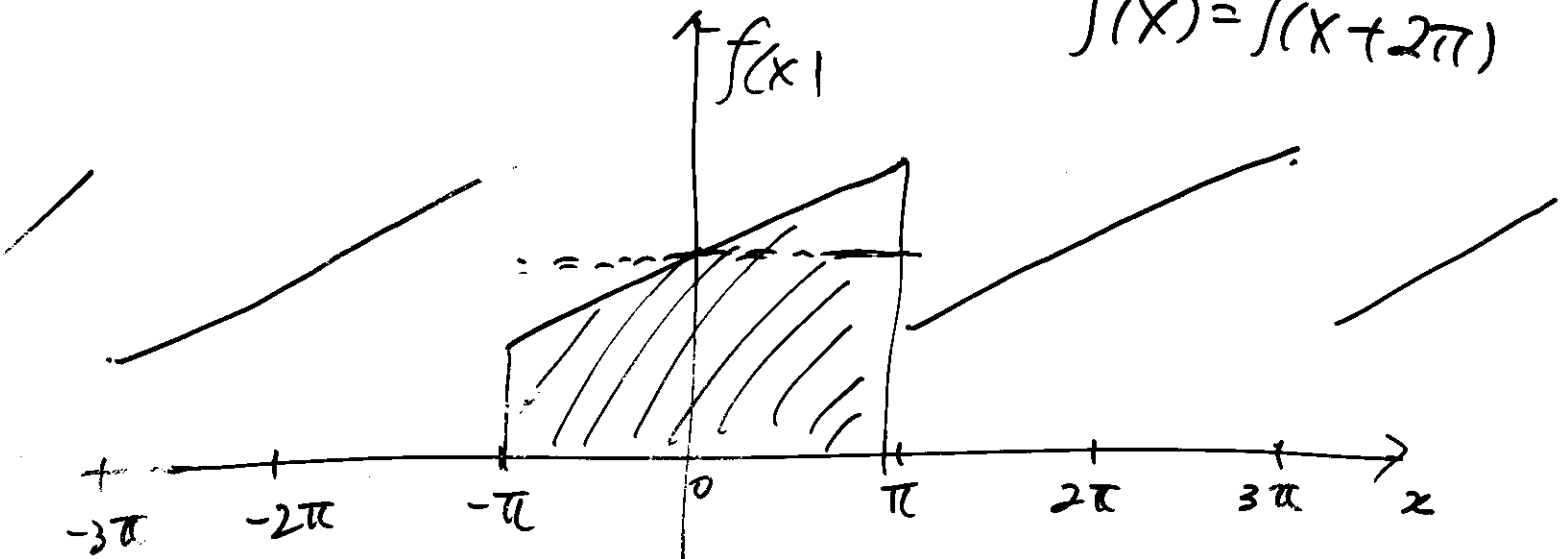
$$\sin nx = \frac{1}{2i}\left[e^{inx} - e^{-inx}\right]$$

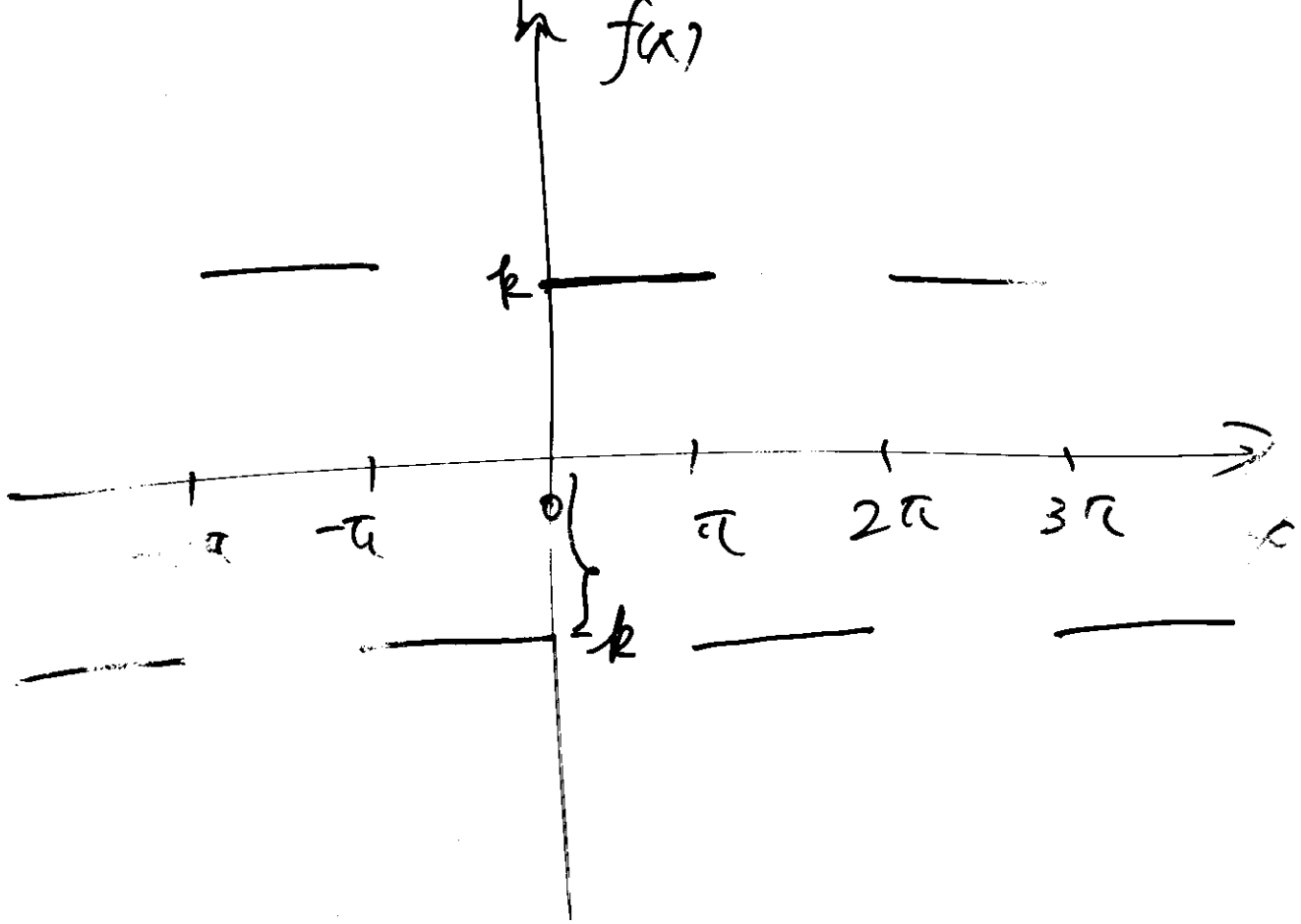


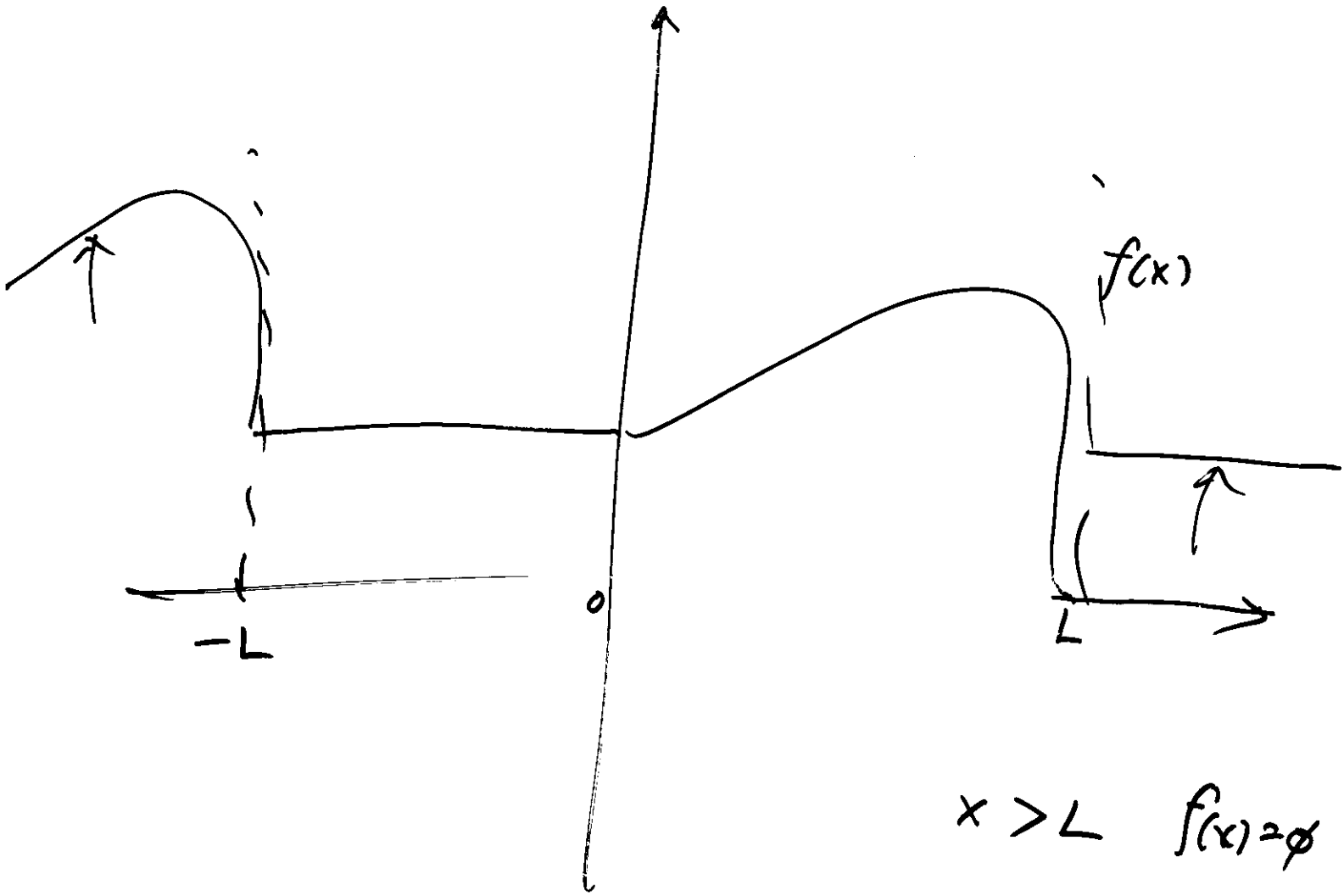
Even: $f(x) = f(-x)$

odd: $f(x) = -f(-x)$

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

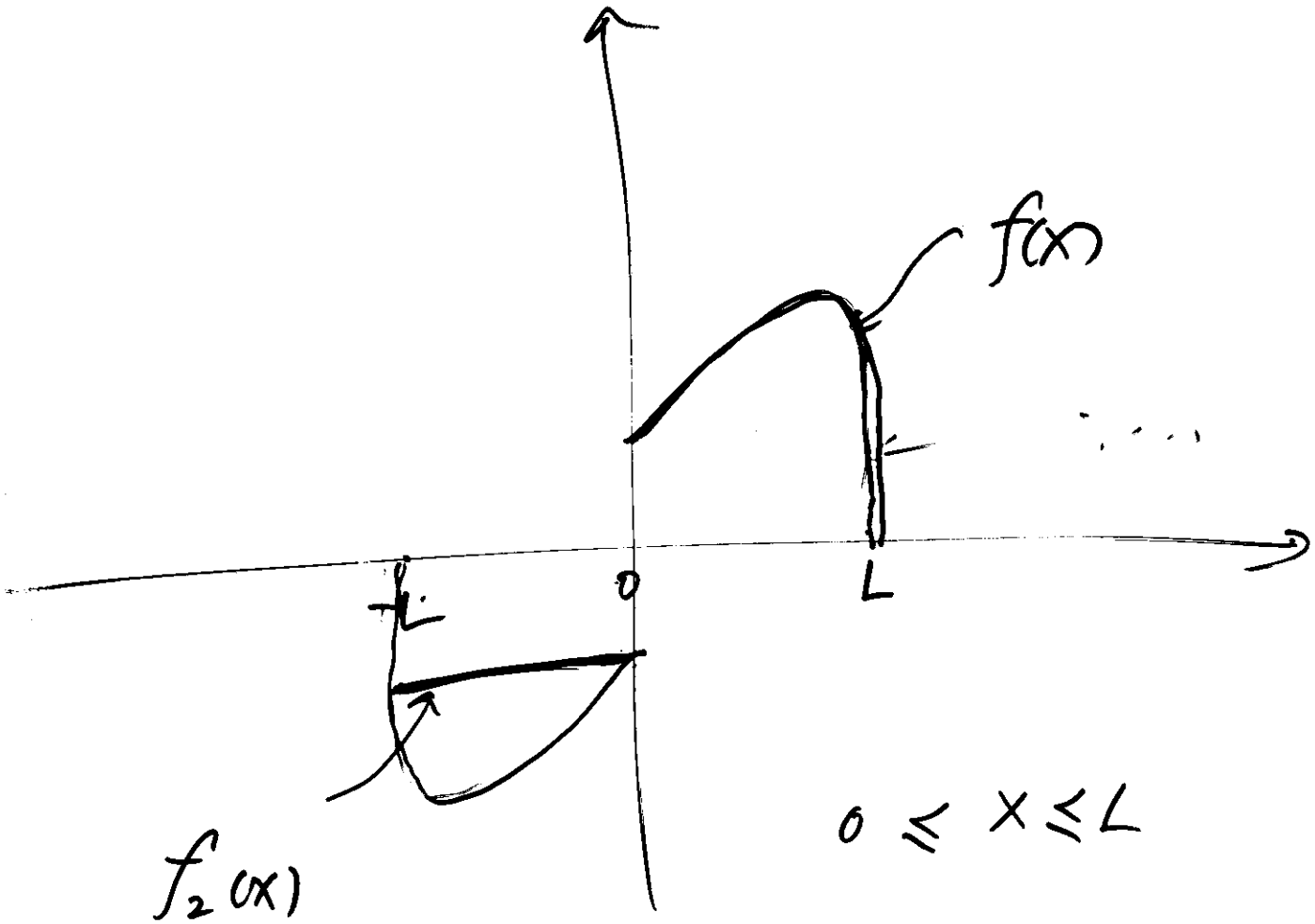






$x > L \quad f(x) = 0$

$$f(x) = f(x+2L)$$



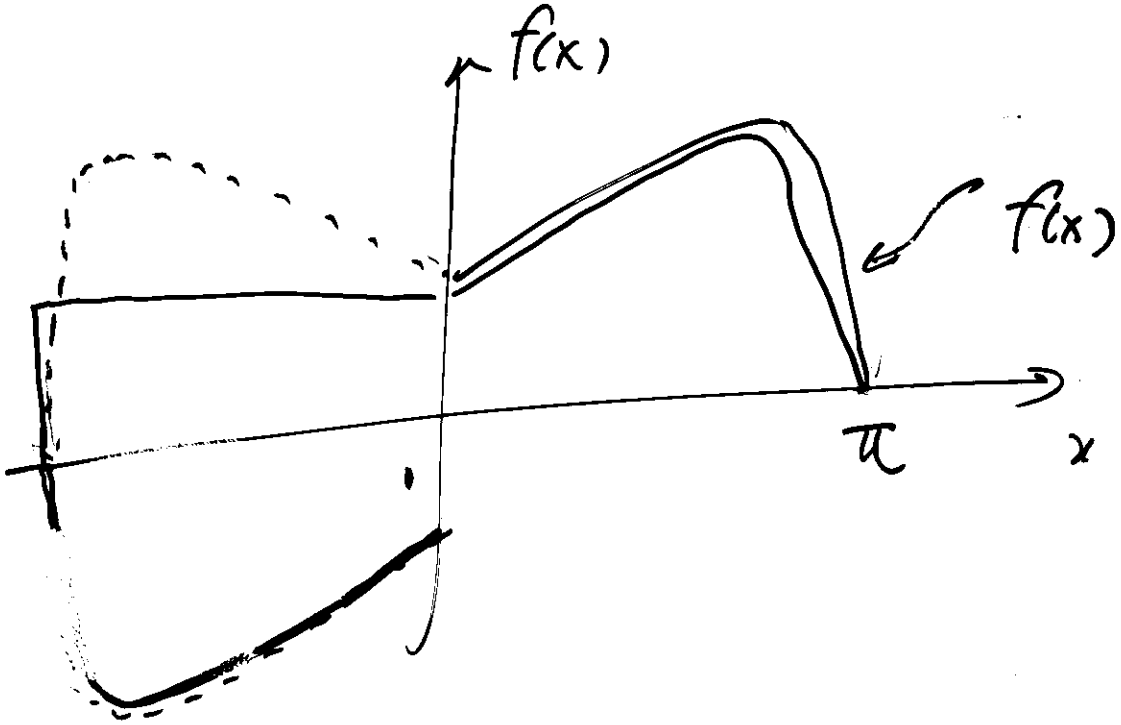
$$f_1(x) = f(x) \quad \text{for } 0 \le x \le L$$

$$= -f_1(-x) \quad \text{for } -L \le x \le 0$$

$$f_1(x+2L) = f_1(x)$$

$$= \frac{a_0}{2} + \sum_{n=1}^{\infty} a_n \cos\frac{n\pi}{L}x + b_n \sin\frac{n\pi}{L}x$$

$$f_1(x) = \sum_{n=1}^{\infty} b_n \sin\frac{n\pi}{L}x$$



$$f(x) = f(-x)$$