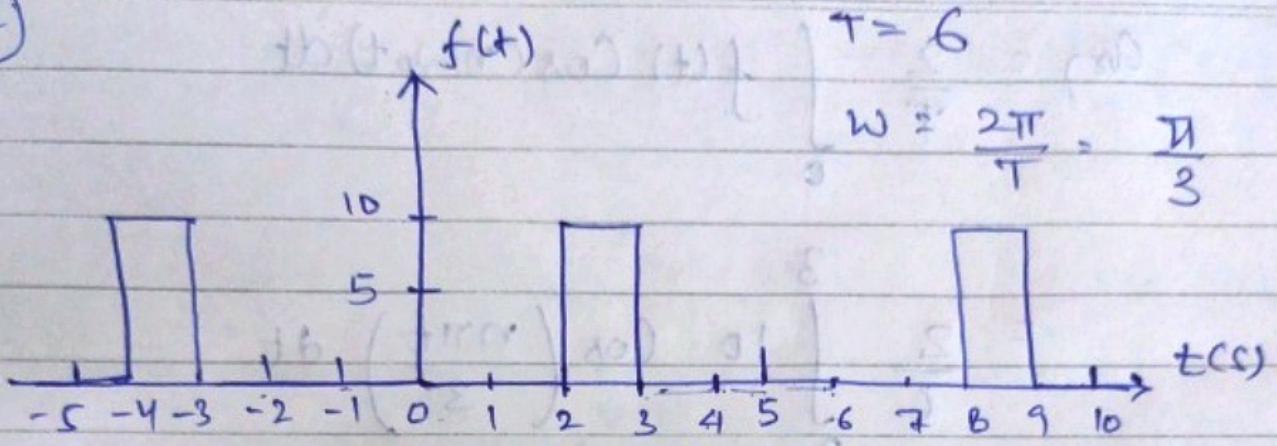
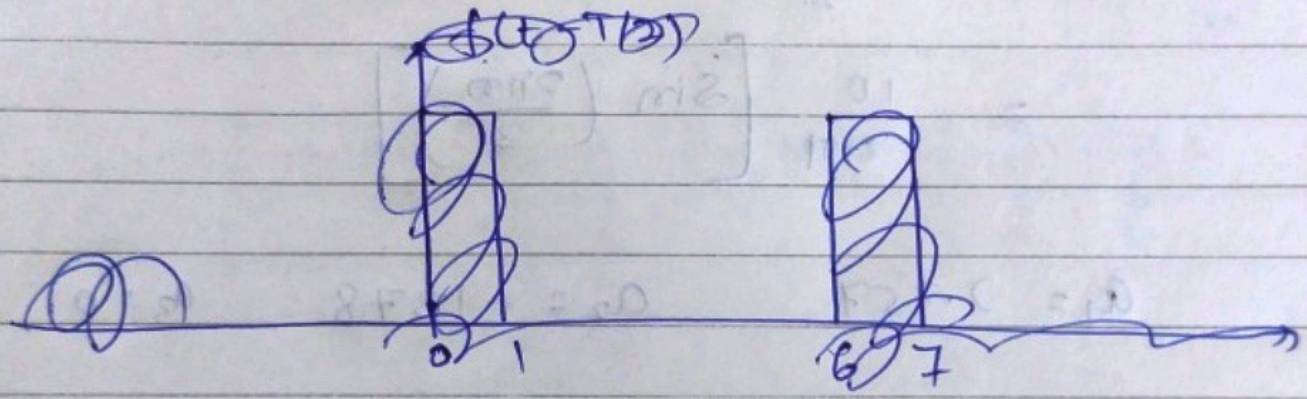
Tutorial

(1)



$T = 6$

$\omega = \frac{2\pi}{T} = \frac{\pi}{3}$



$$\Rightarrow a_0 = \frac{1}{T}\int_0^T f(t)\cdot dt$$

$$= \frac{1}{6}\int_2^3 10\, dt = \frac{5}{3}$$

$$a_n = \frac{2}{T}\int_0^T f(t)\cos(n\omega_0 t)\,dt$$

$$= \frac{2}{6}\int_2^3 10\cos\left(\frac{n\pi t}{3}\right)dt$$

$$= \frac{10}{n\pi}\left[\sin\left(\frac{2\pi n}{3}\right)\right]$$

$a_1 = 2.757 \qquad a_2 = -1.378 \qquad a_3 = 0$

$$b_n = \frac{2}{T}\int_0^T f(t)\sin(n\omega_0 t)\,dt$$

$$= \frac{1}{3}\int_2^3 10\sin\left(\frac{n\pi t}{3}\right)dt$$

$$= \frac{10}{3}\left[\frac{-\cos\left(\frac{n\pi t}{3}\right)}{\frac{n\pi}{3}}\right]^3$$

$$= -\frac{10}{n\pi}\left[\left(\cos(n\pi)\right) - \left(\cos\left(\frac{2\pi n}{3}\right)\right)\right]$$

$b_1 = 1.59 \qquad b_2 = -2.38 \qquad b_3 = 2.122$