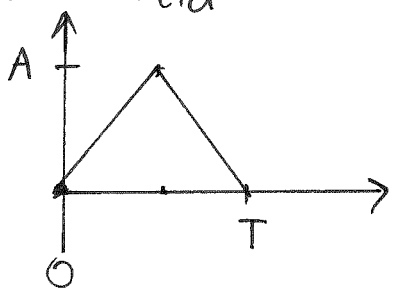
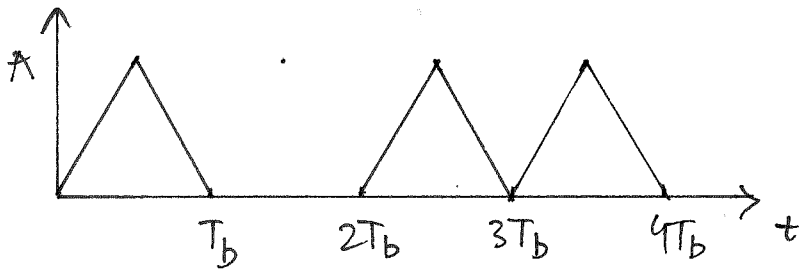
Problem 1.1

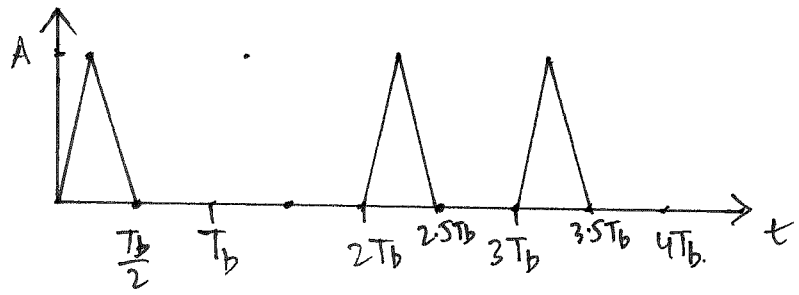
$g(t) = g_{tri}(t)$



(a) $T = T_b$. $b = 10110$

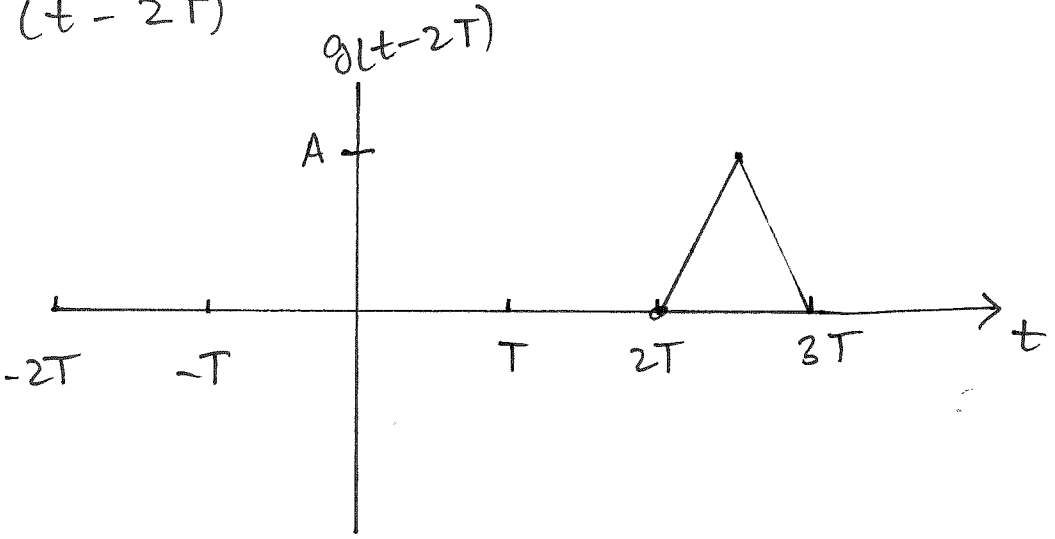


(b) $T = \frac{T_b}{2}$



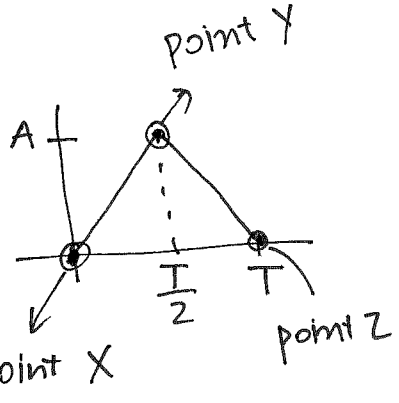
Problem 1.2

(a) Draw $g(t-2T)$



(b) Draw $g\left(\frac{(t-T)}{2}\right)$

Since $g(t)$



(Figure 1.)

Lets evaluate point X, Y, Z in Fig 1.

Point X $g(0)$ is 0 in Fig. 1.

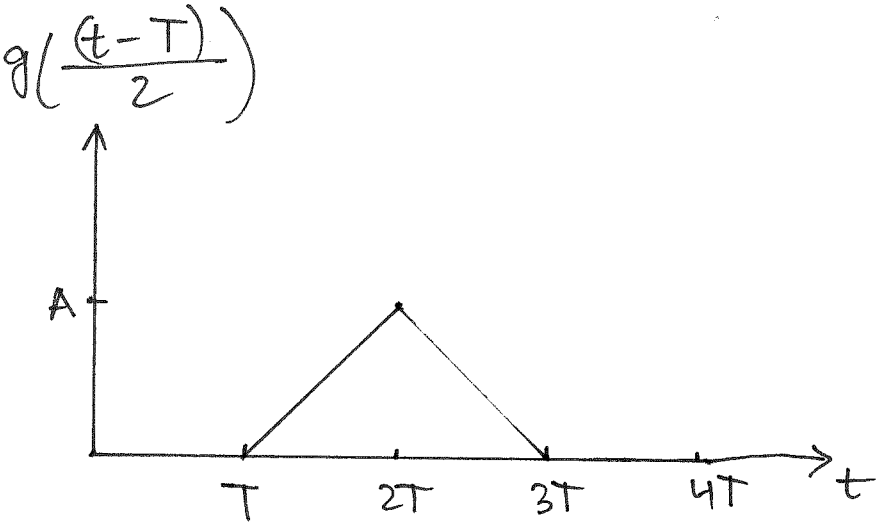
$$\frac{t-T}{2} = 0 \Rightarrow t = T$$ (Starting point on t-axis of $g\left(\frac{t-T}{2}\right)$).

Point Y

$$\frac{t-T}{2} = \frac{T}{2} \Rightarrow t = 2T$$ (Max point on t-axis of $g\left(\frac{t-T}{2}\right)$).

Point Z

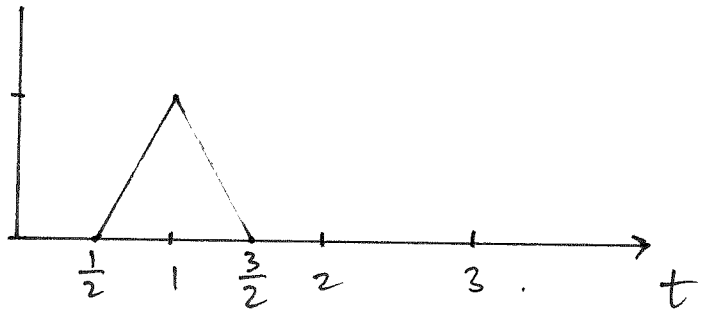
$$\frac{t-T}{2} = T \Rightarrow t = 3T$$ (End point on t-axis of $g\left(\frac{t-T}{2}\right)$).



(C) Draw $g(tT - T/2)$

$$g(tT - \tfrac{T}{2}) = g(T(t - \tfrac{1}{2})) = g\left(\frac{(t-\frac{1}{2})}{\frac{1}{T}}\right)$$

which is shifting by $\frac{1}{2}$ and scale by T, similar to the part b of problem 1.2.

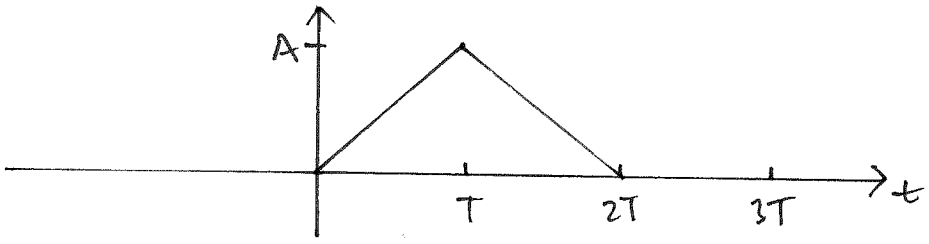


Problem 1.3

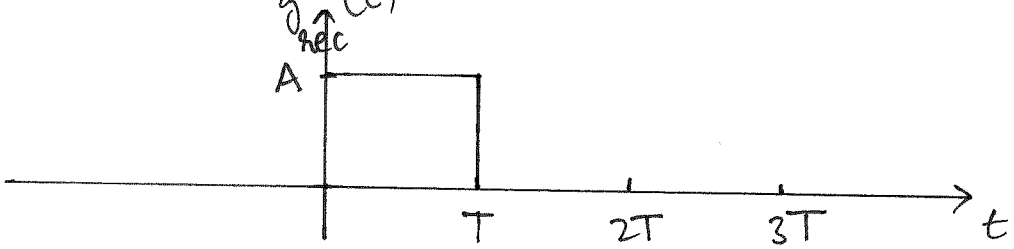
$$x(t) = g_{tri}\left(\frac{t}{2}\right) \cdot g_{rec}(t).$$

(a) Draw $x(t)$

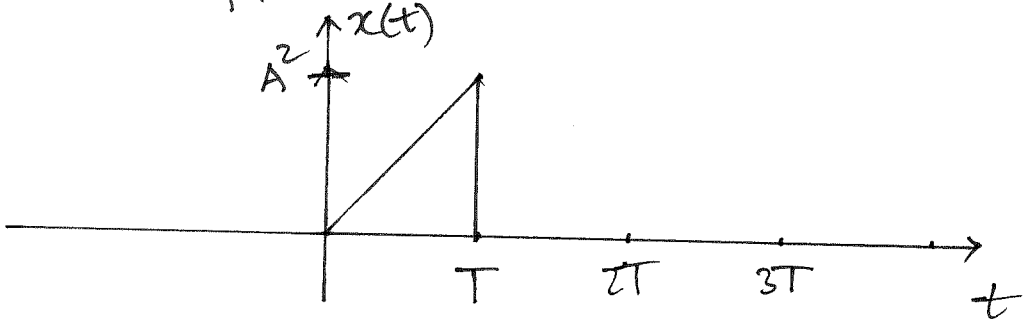
$g_{tri}(t/2)$



$g_{rec}(t)$

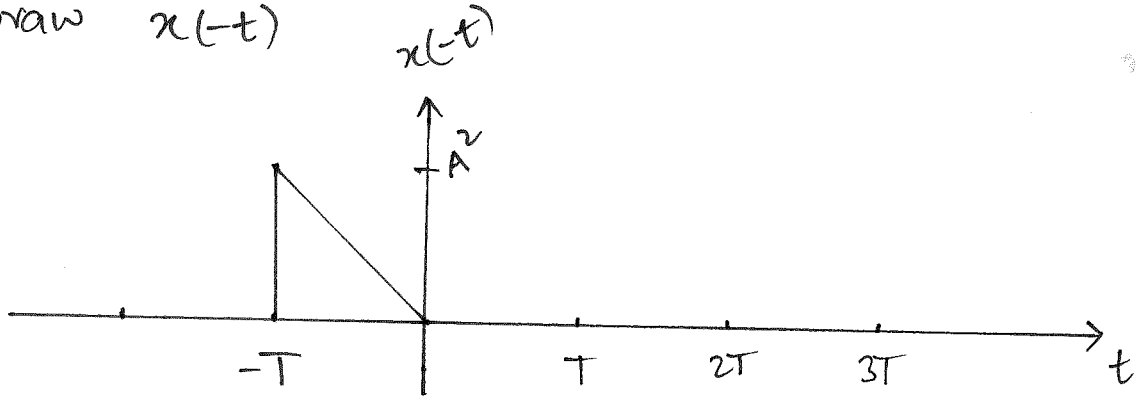


Resultant waveform $x(t)$

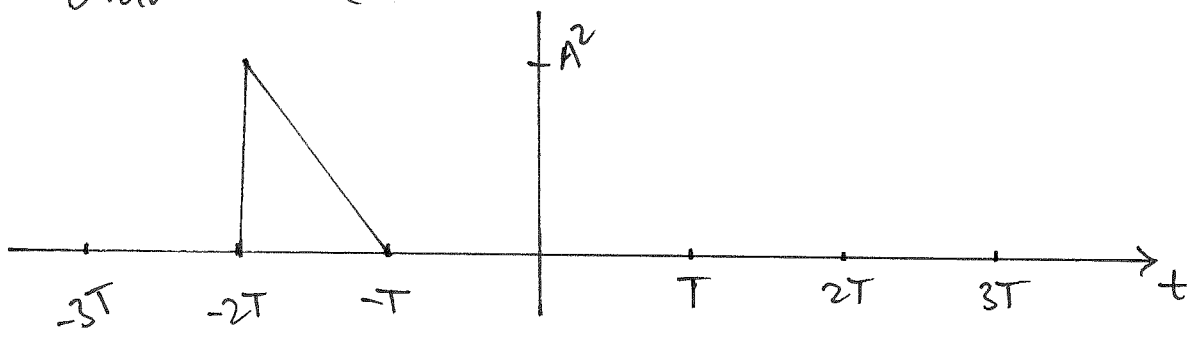


(b) Draw $x(-t)$

$x(-t)$



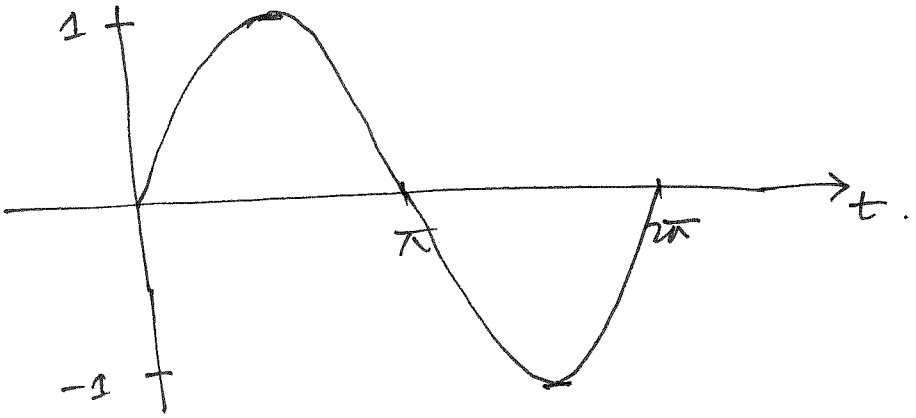
(c) Draw $x(-t-T)$



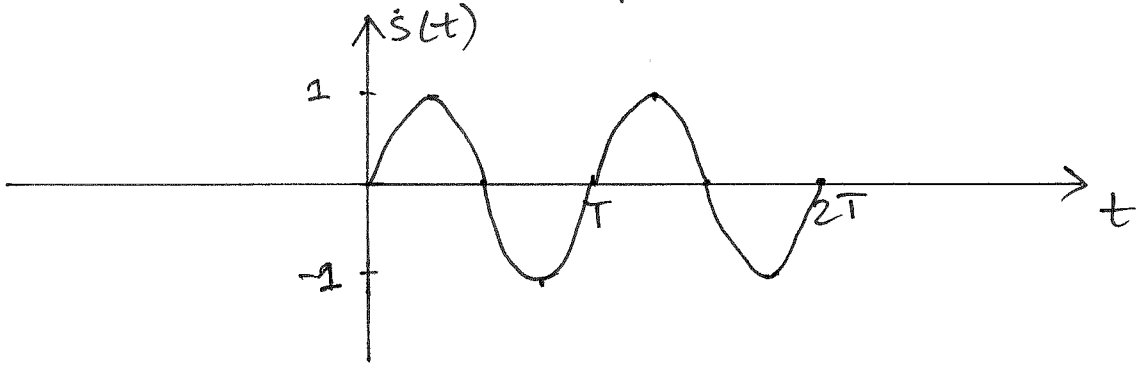
Problem 1.4 (a)

(a) Draw $s(t) = \sin(t)$ in $0 \le t \le 2\pi$

(a)



(b) Draw $s(t) = \sin\left(\frac{2\pi}{T} t\right)$ in $0 \le t \le 2T$



(C) Draw $s(t) = \sin\left(\frac{2\pi}{T} t + \frac{\pi}{2}\right)$.