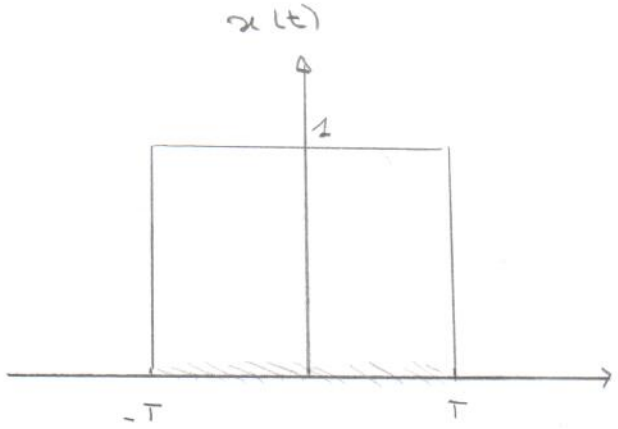
$$x(t) = \text{rect}_T(t) = 1_{[-T,T]}$$

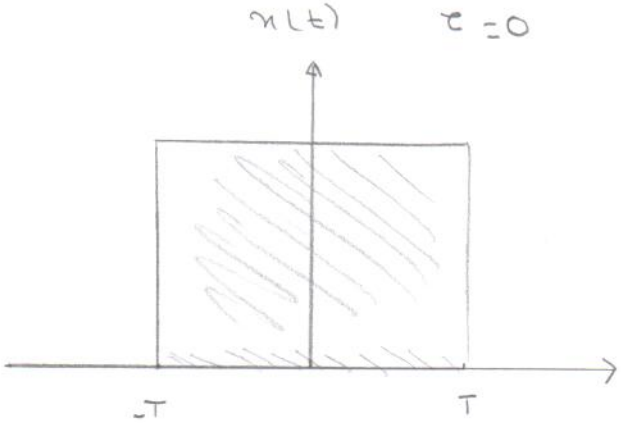
$$x(t-\tau) = 1 \qquad -T \le t-\tau \le T$$

$$\tau - T \le t \le T + \tau$$

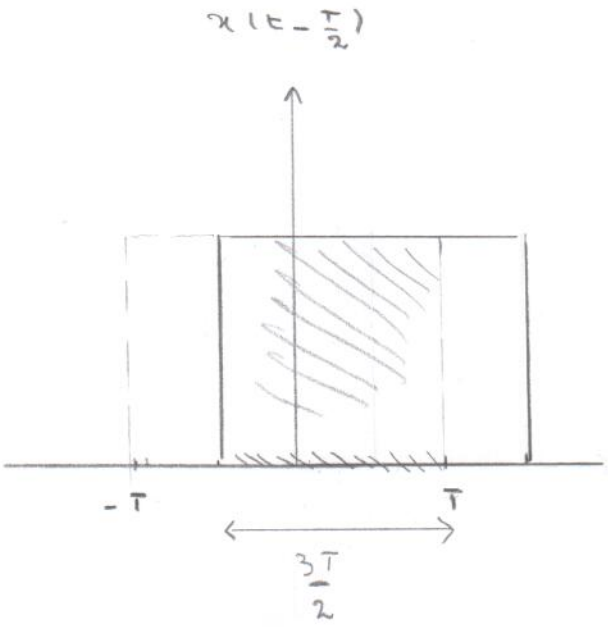
$$\max\{-T, \tau-T\} \le t \le \min\{T, T+\tau\}$$

$$R_x(\tau) = \int_{\max\{-T,\tau-T\}}^{\min\{T,\tau+T\}} dt$$



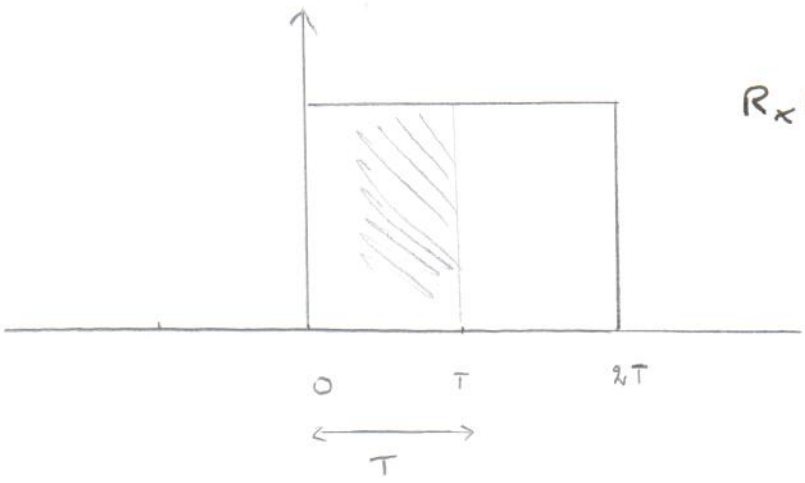


$$R_x(0) = 2T$$



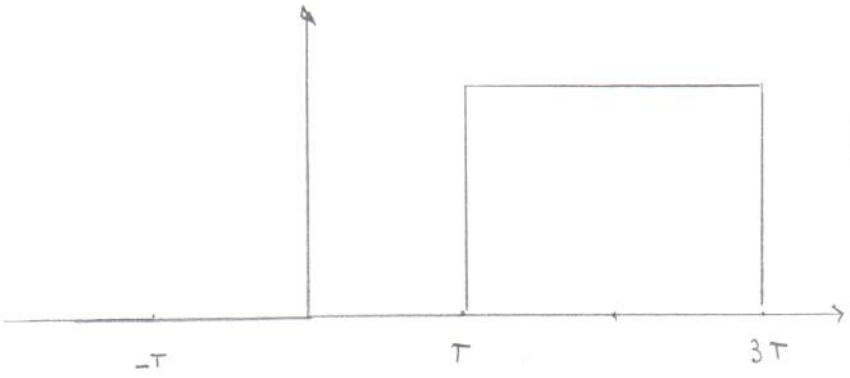
$$R_x\left(\frac{T}{2}\right) = \int_{-\frac{T}{2}}^{T} dt = \frac{3T}{2}$$

$x(t-T)$



$$R_x(T) = \int_0^T dt = T$$

$x(t-2T)$



$$R_x(2T) = \int_T^T dt = 0$$