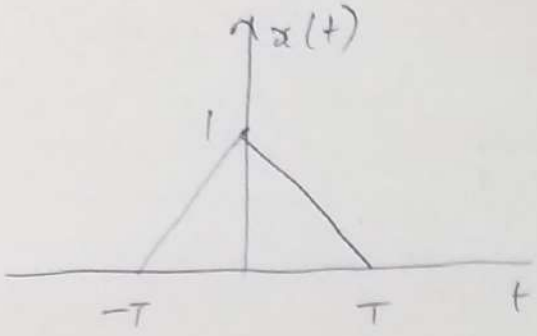
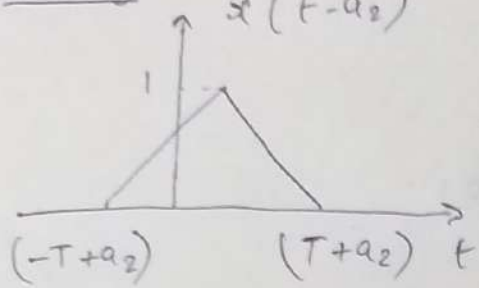
7)

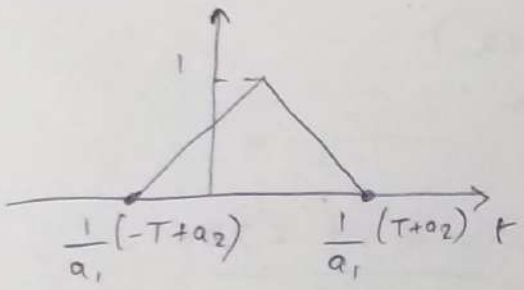


$y(t) = x(a_1 t - a_2)$?

1) Shifting

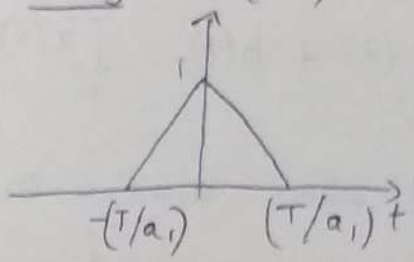


2) Scaling $x(a_1 t - a_2)$

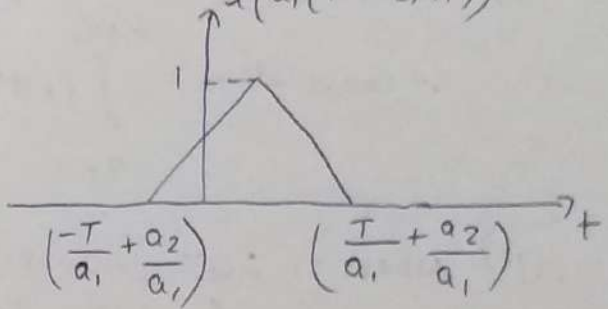


(or) $y(t) = x(a_1(t - a_2/a_1))$

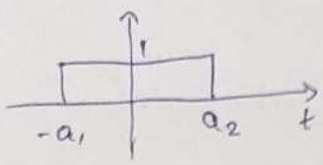
1) Scaling $x(a_1 t)$

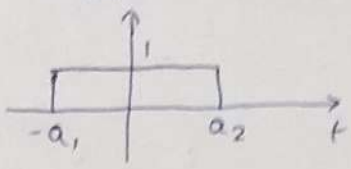


2) Shifting $x(a_1(t - a_2/a_1))$

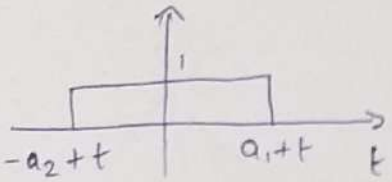


8) $x(\tau)$ $h(\tau)$





$h(t-\tau)$



$$x(t) * h(t) = \int_{-\infty}^{\infty} x(\tau)\, h(t-\tau)\, d\tau$$

(i) when $a_1+t < -a_1 \Rightarrow \underline{t < -2a_1}$

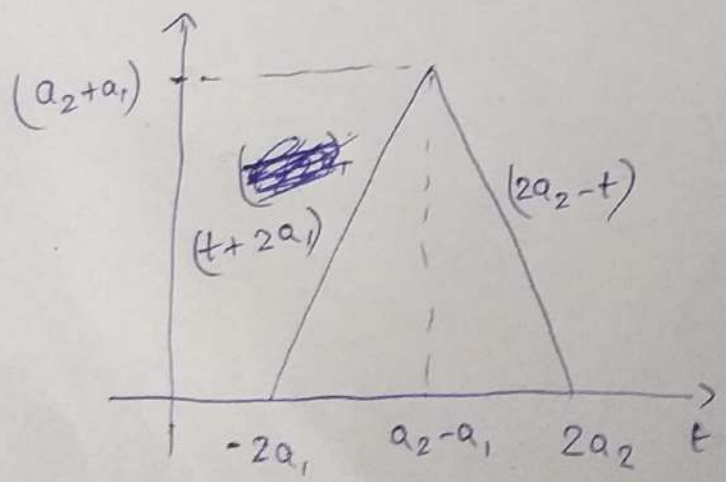
convolution = 0

(ii) when $-a_1 < a_1+t < a_2 \Rightarrow \underline{-2a_2 < t < a_2-a_1}$

$$\text{convolution} = \int_{-a_1}^{t+a_1} 1 \cdot d\tau = (t+2a_1)$$

(iii) when $-a_1 < -a_2+t < a_2 \Rightarrow \underline{a_2-a_1 < t < 2a_2}$

$$\text{convolution} = \int_{-a_2+t}^{a_2} 1 \cdot d\tau = (2a_2-t)$$

(iv) when $-a_2+t > a_2 \Rightarrow t > 2a_2$

convolution = 0