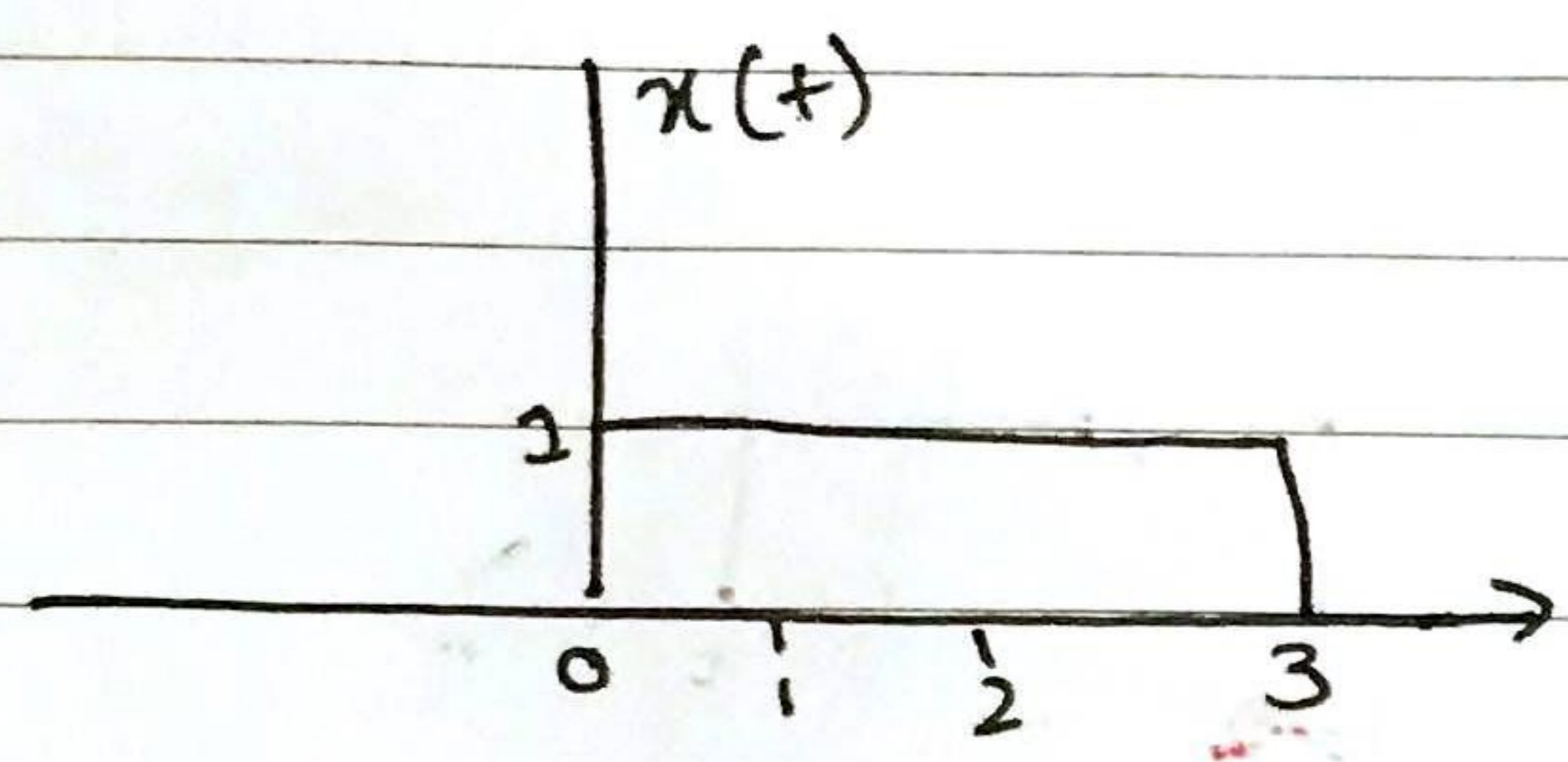
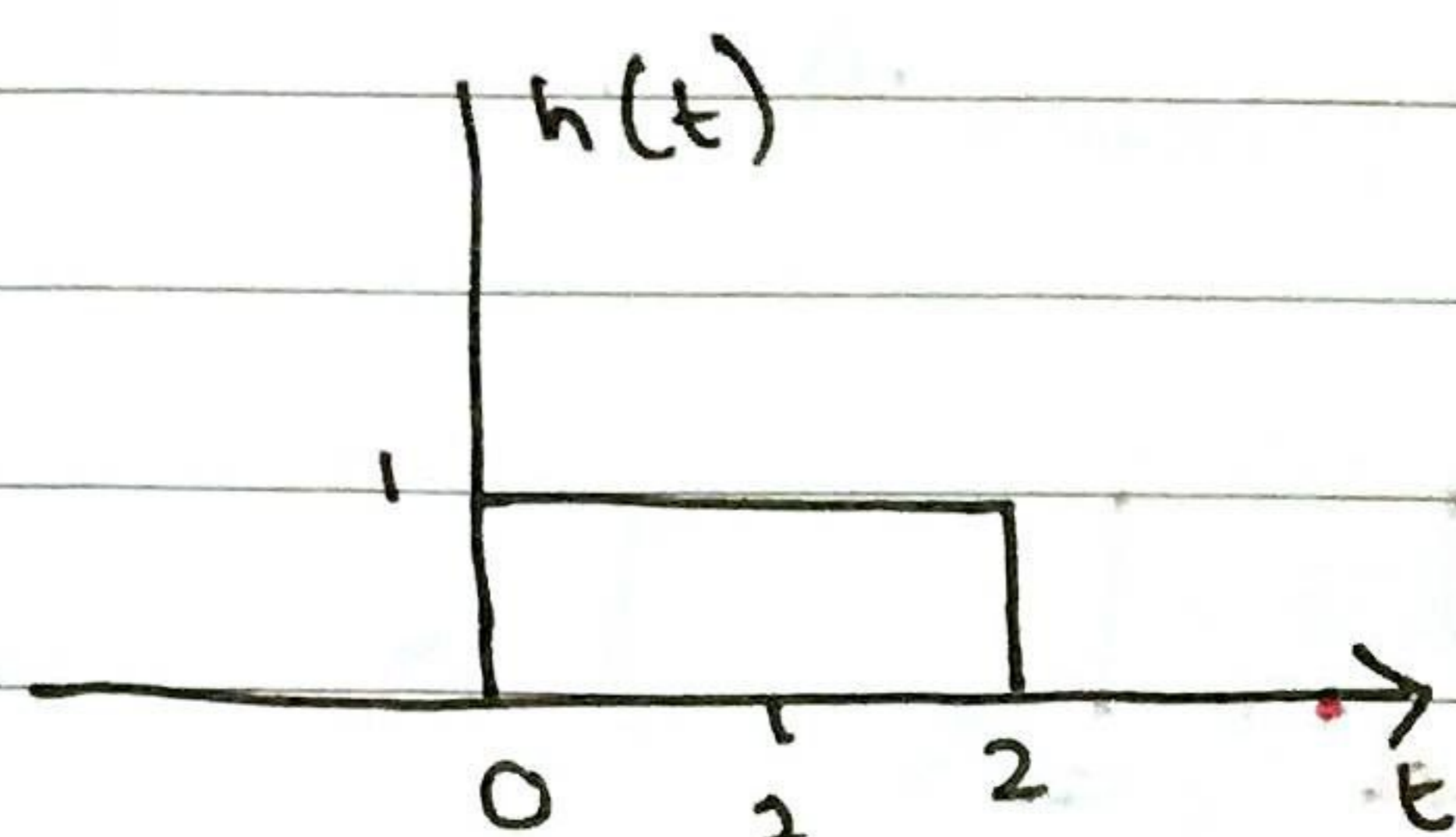


Date:

QUESTION #2:-

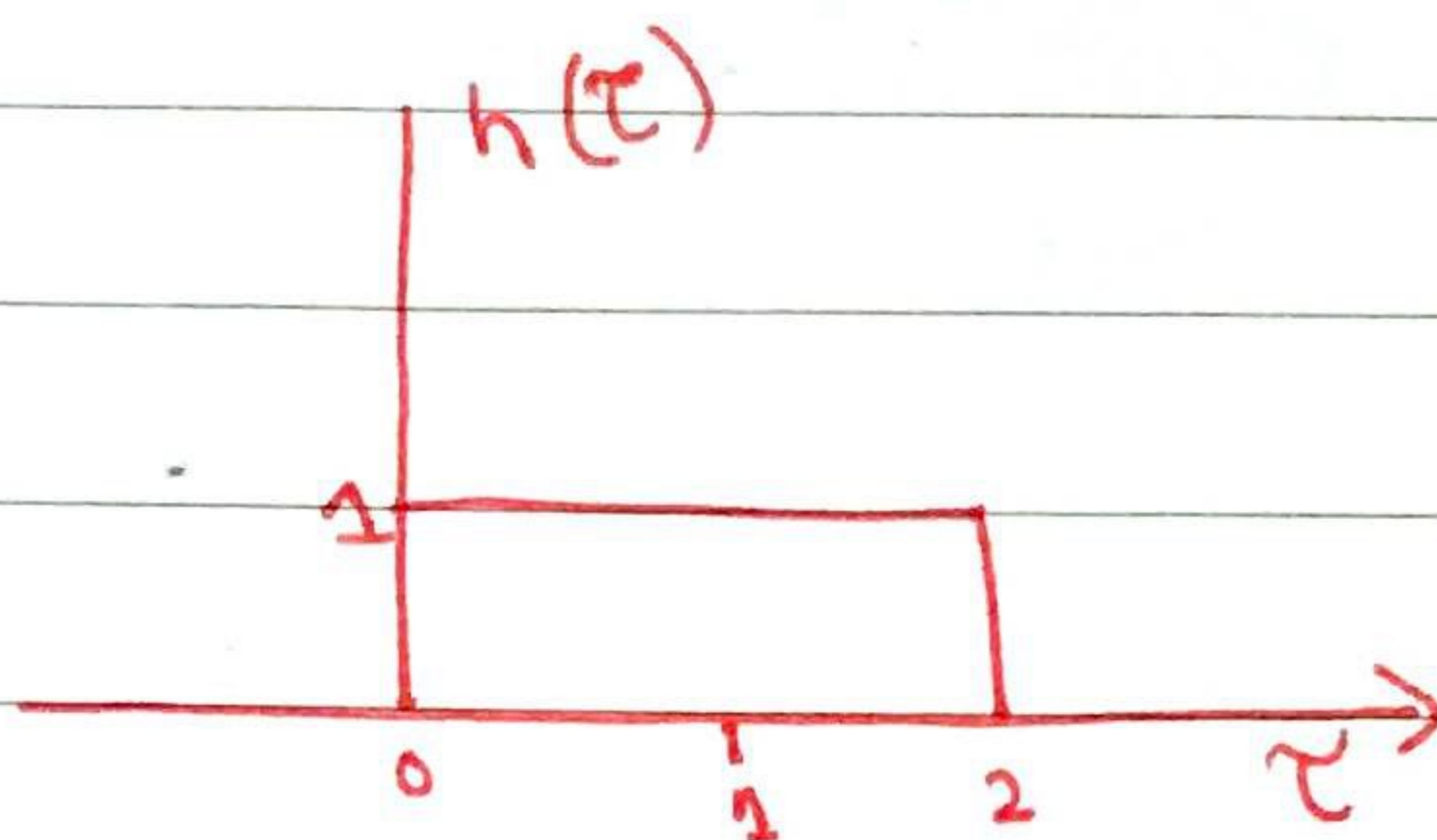
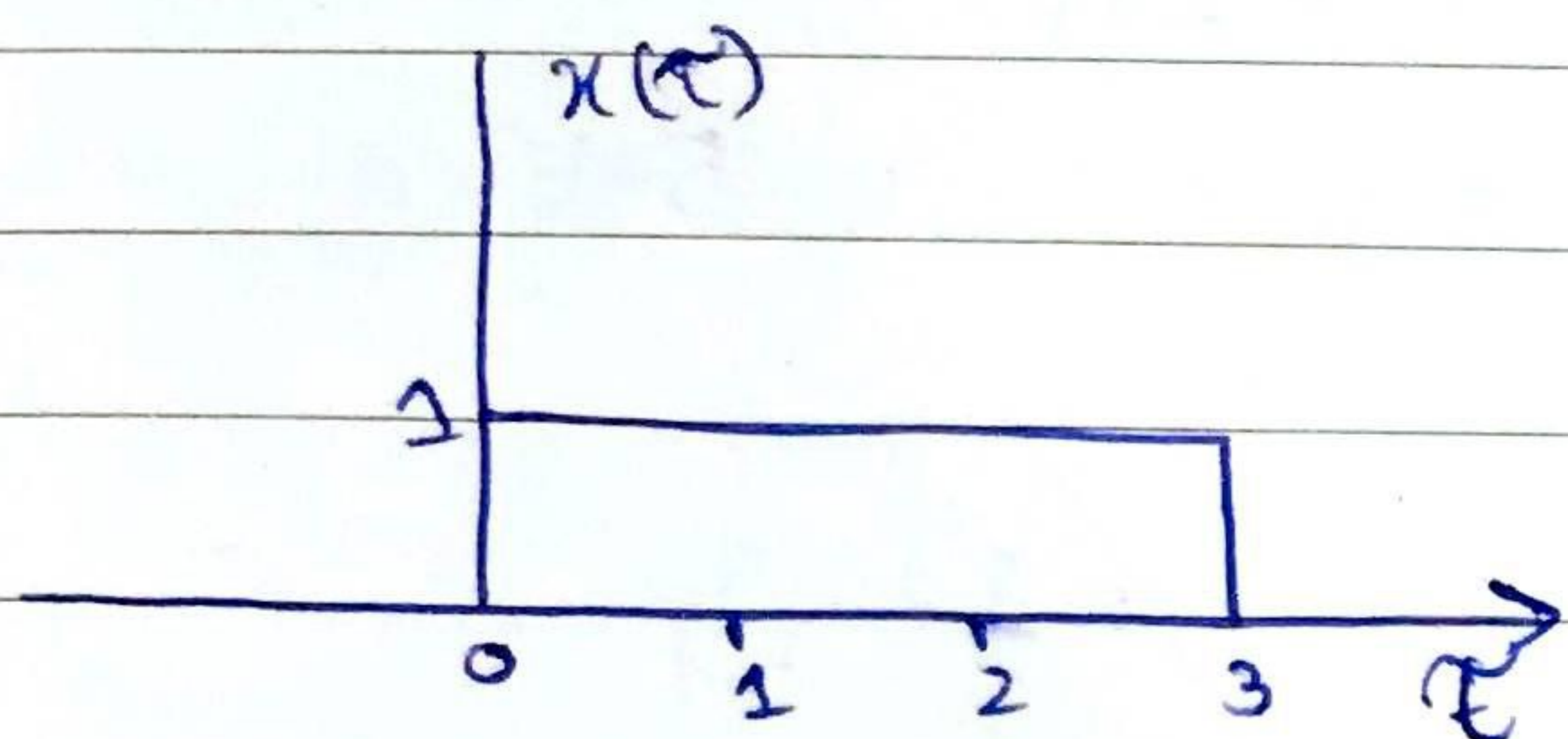


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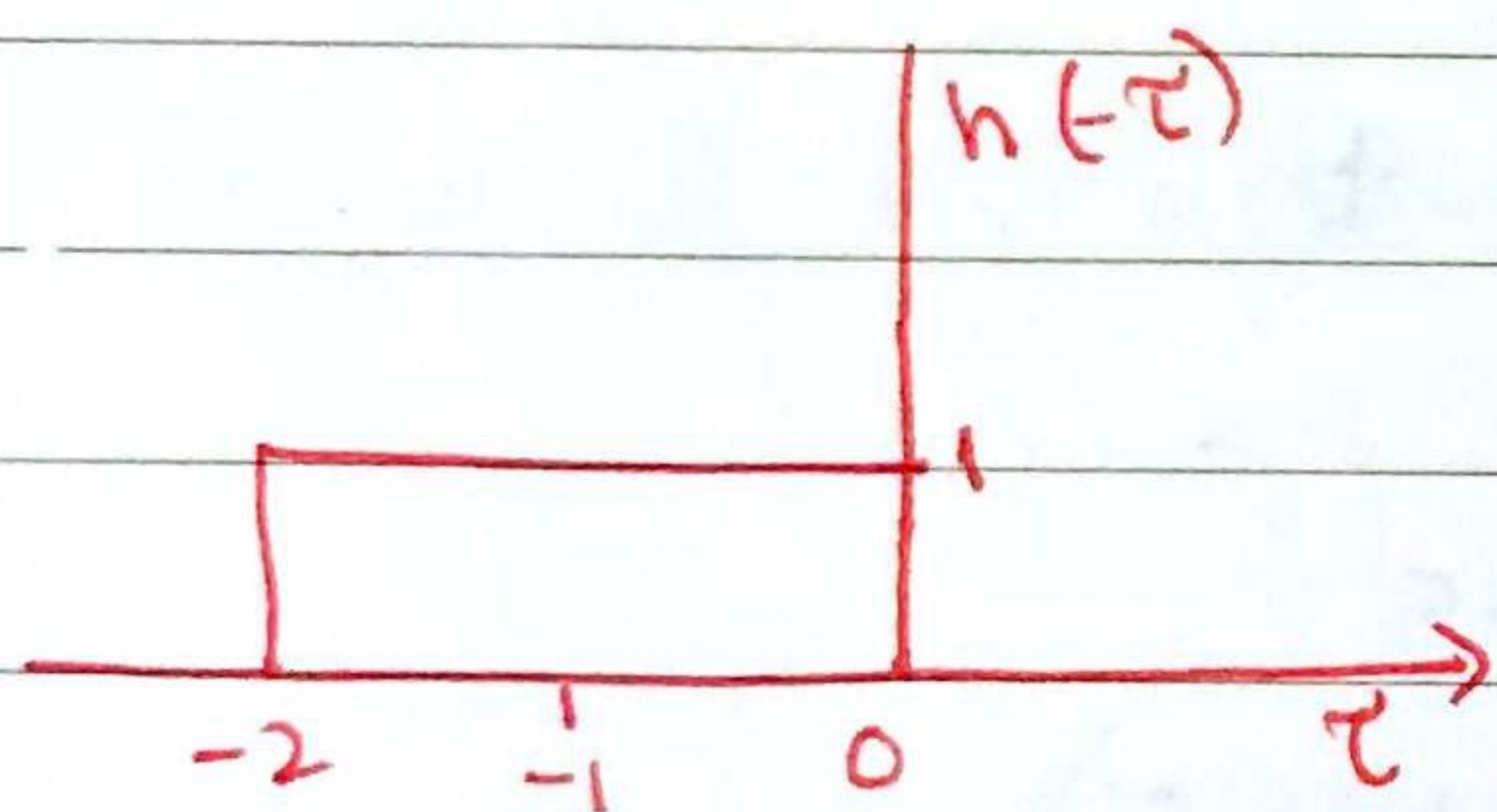


Solve

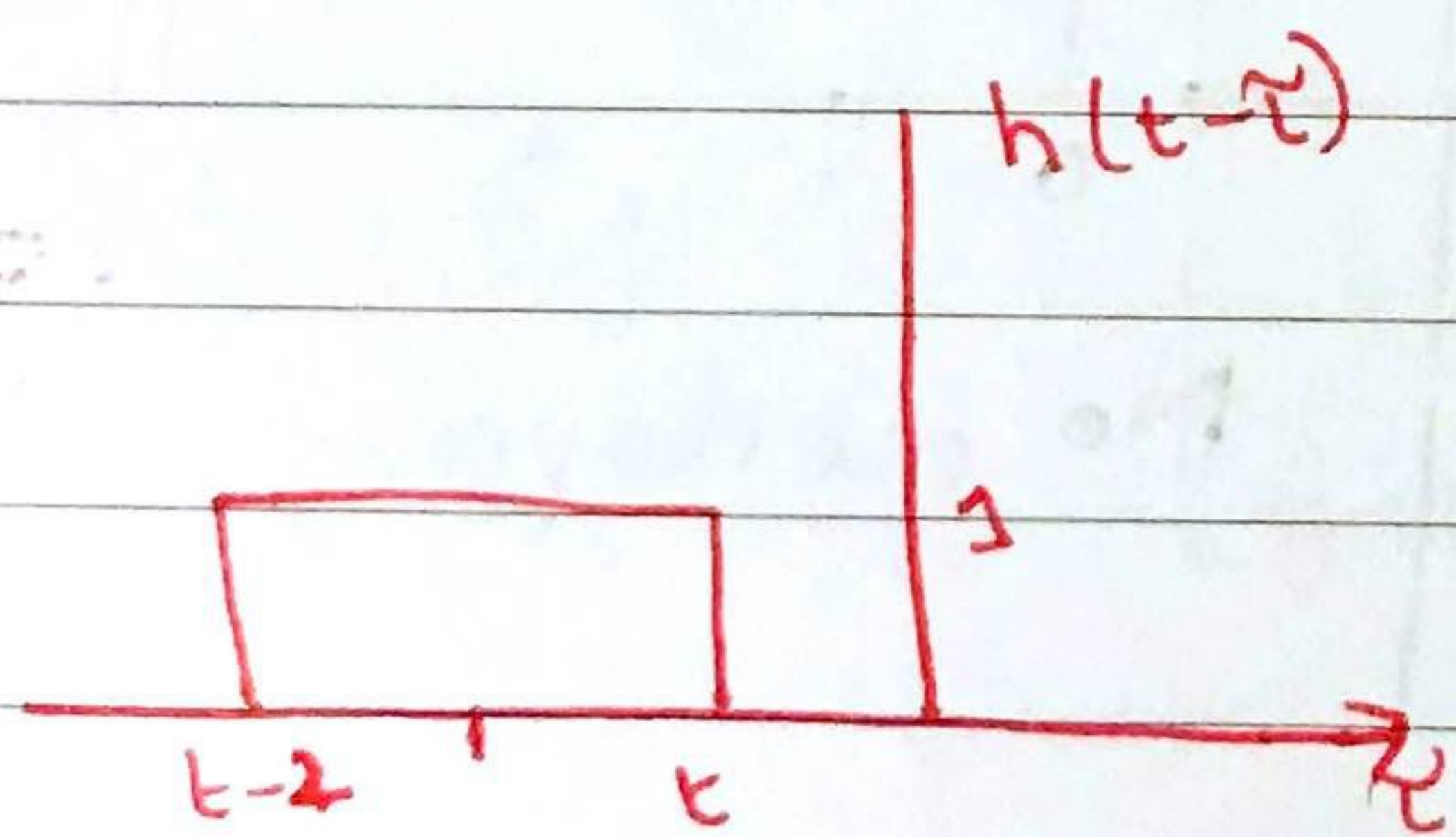
Step #1: Change $t \rightarrow \tau$.



Step #2: Flip $h(\tau)$.



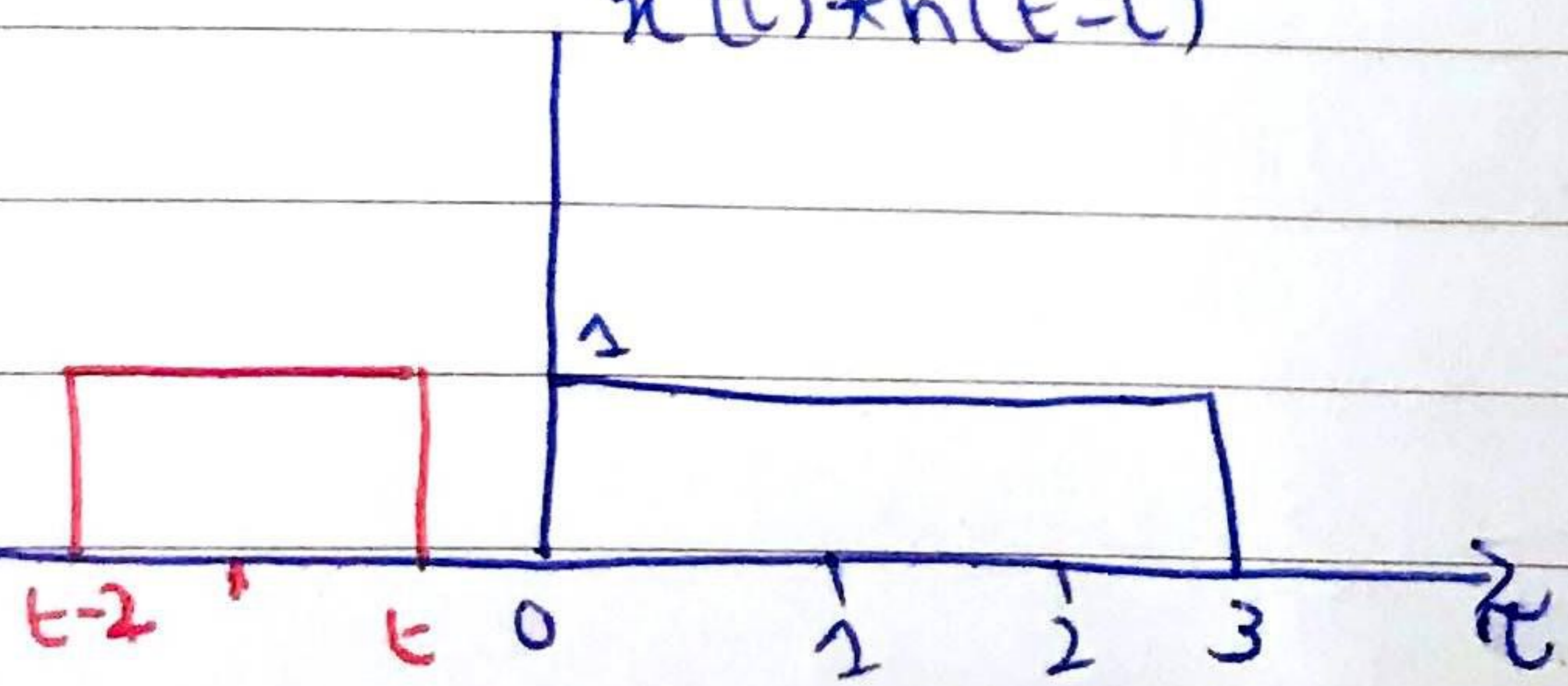
Step #3: Shift $h(\tau)$.



Step #4: ~~Overlap~~ Multiply $x(\tau)$ and $h(\tau)$ and integrate.

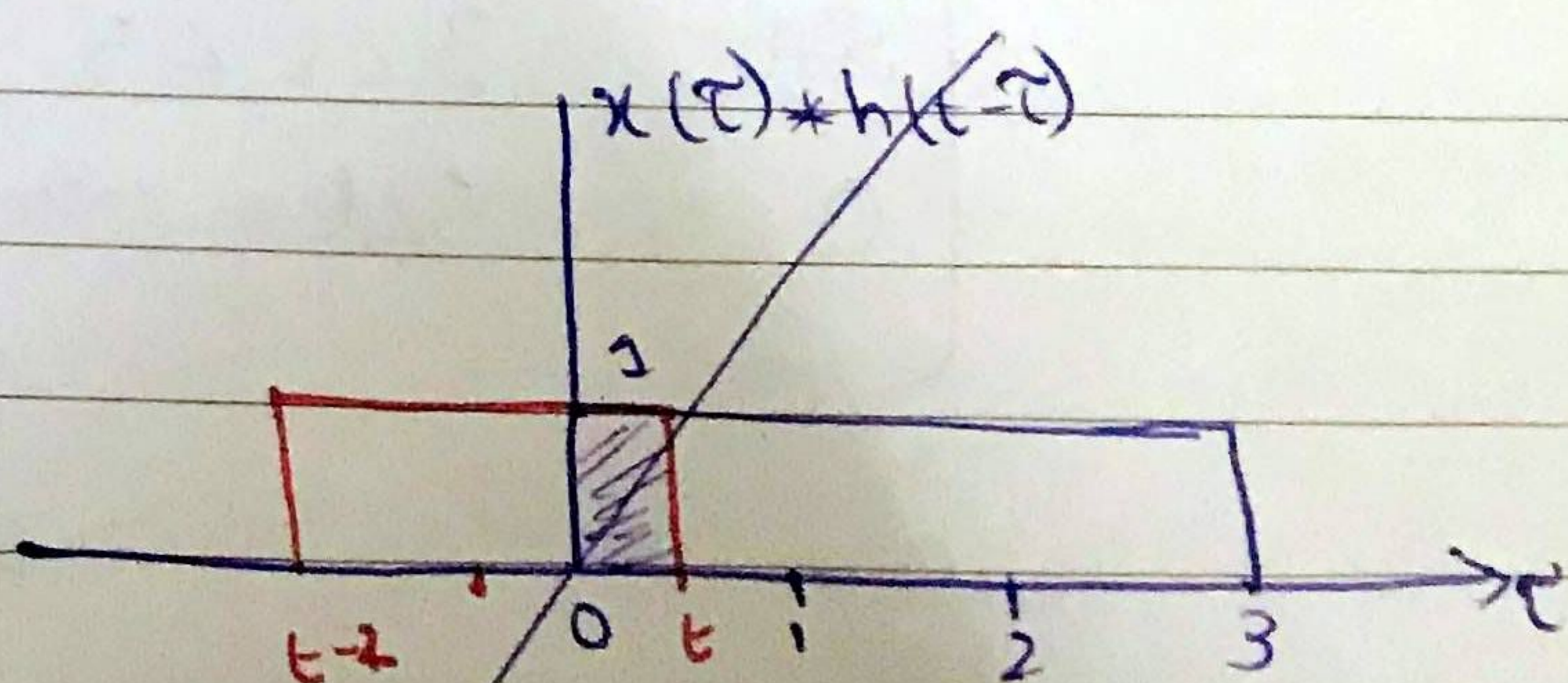
$x(\tau) * h(t-\tau)$

when $0 < t < 1$



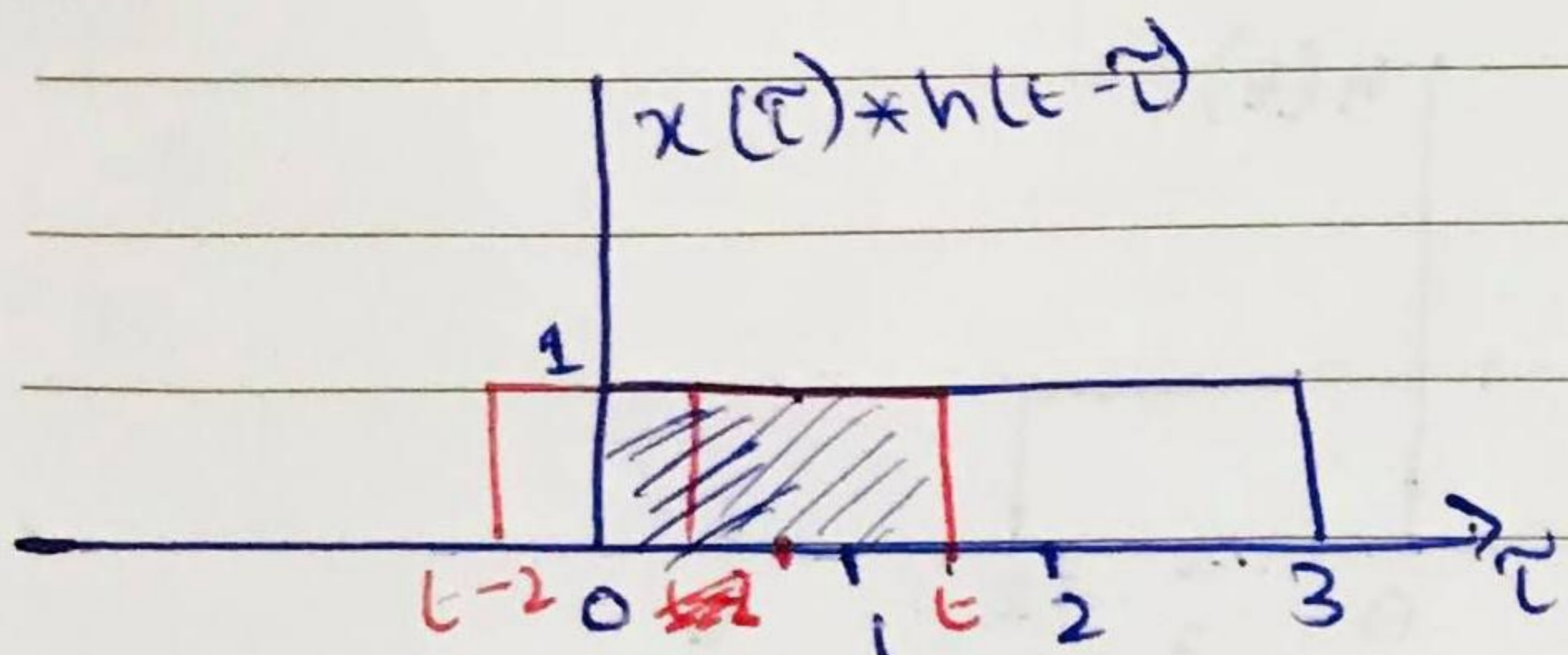
$$y(t) = \int_{-\infty}^{\infty} x(\tau) h(t-\tau) d\tau \Rightarrow 0$$

$t < 0$



$$y(t) = \int_0^t 1 * 1 d\tau = \tau \Big|_0^t \Rightarrow t - 0 \Rightarrow t$$

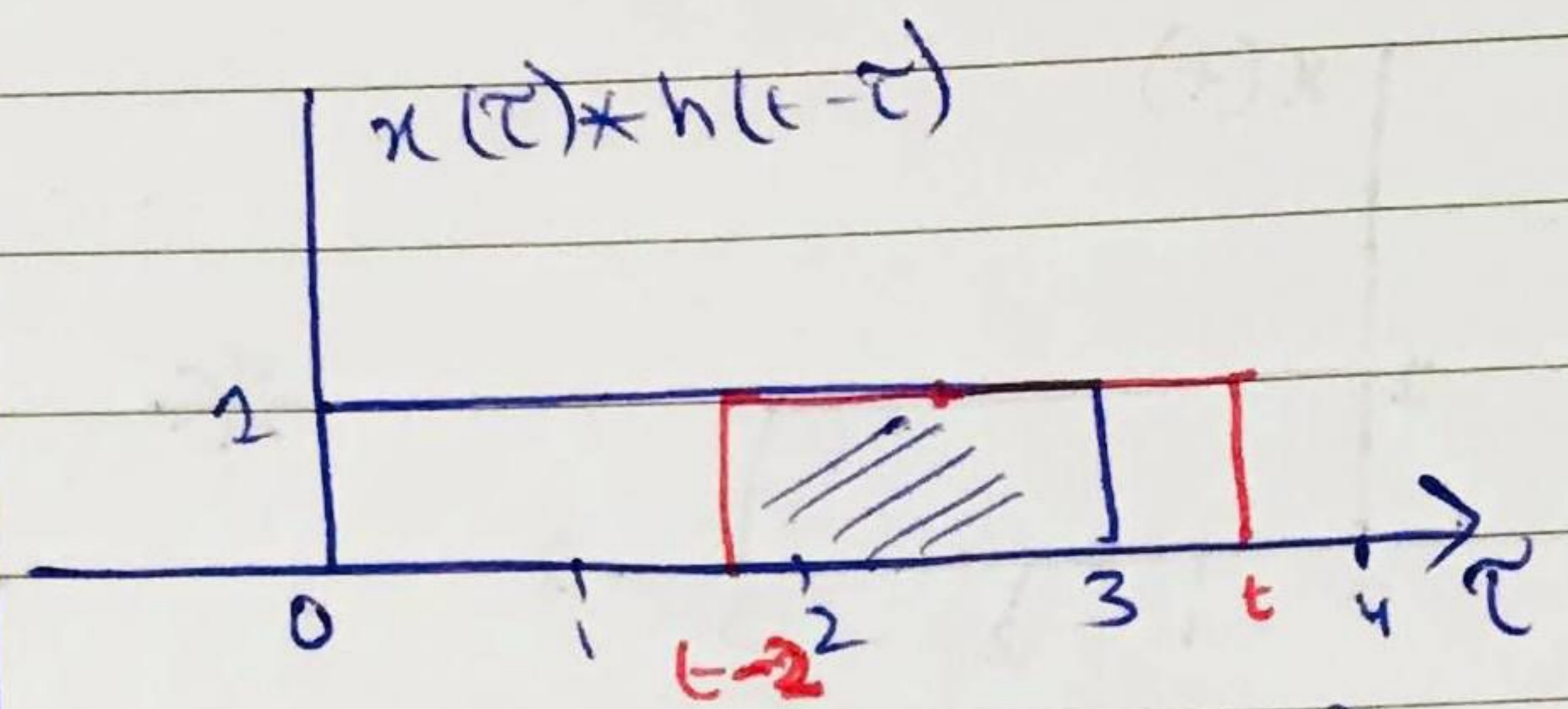
⇒ when $0 < t < 2$



$$y(t) = \int_0^t (1 \times 1) d\tau$$

$$= \tau \Big|_0^t \Rightarrow t - 0 \Rightarrow t$$

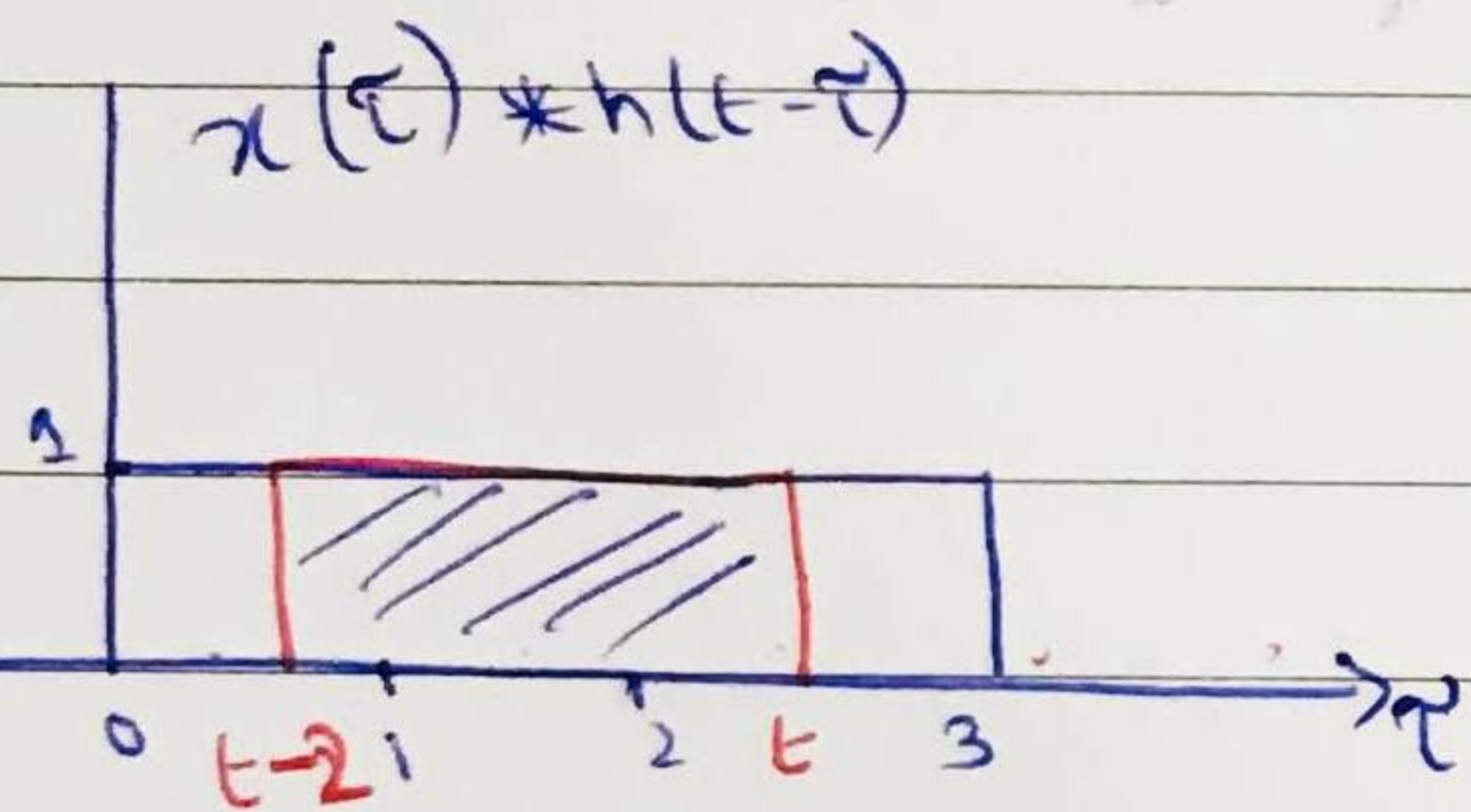
⇒ when $3 < t < 5$



$$y(t) = \int_{t-2}^3 (1 \times 1) d\tau = \tau \Big|_{t-2}^3$$

$$= 3 - (t-2) = 3 - t + 2 \Rightarrow 5 - t$$

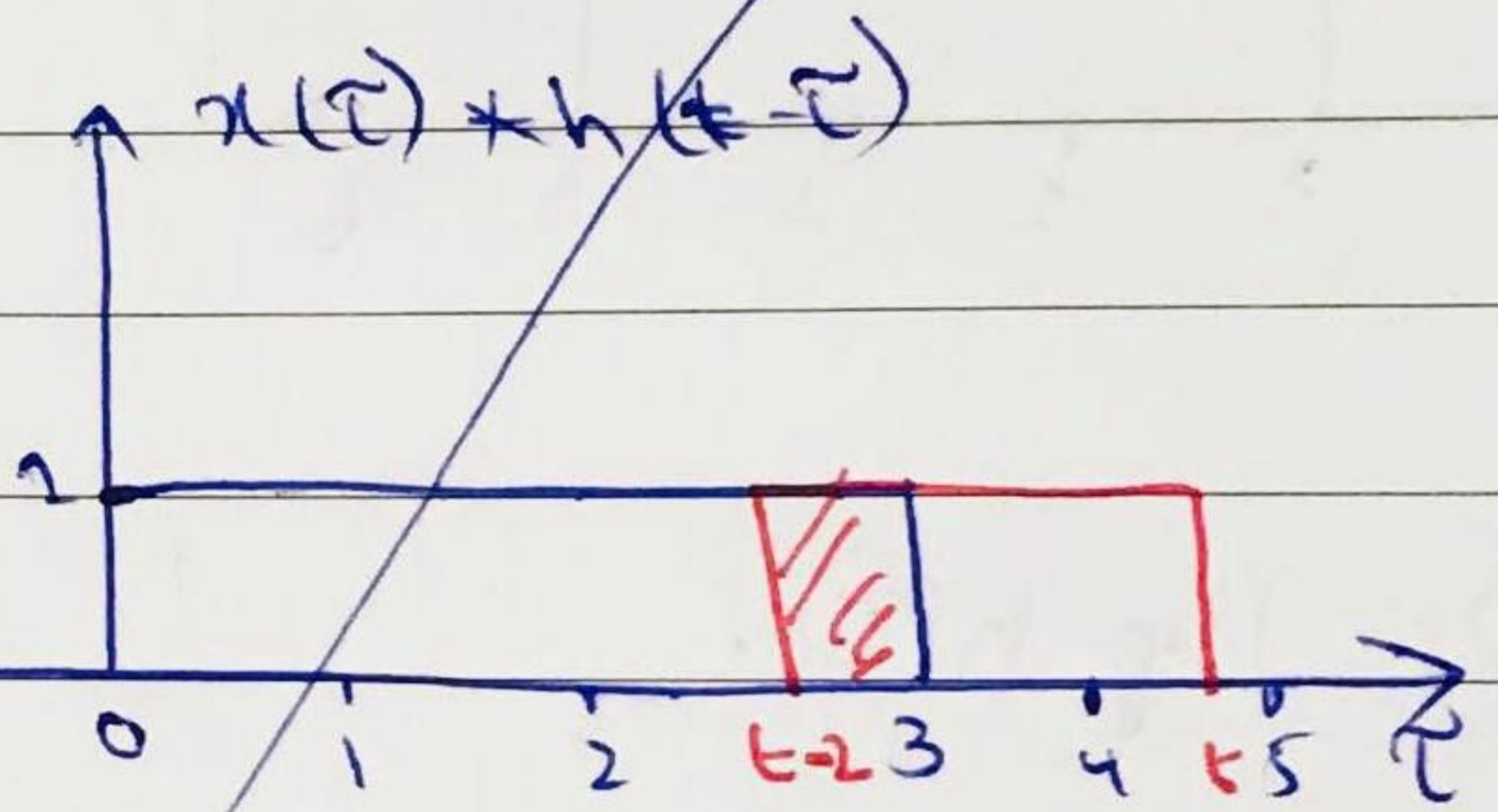
⇒ when $2 < t < 3$



$$y(t) = \int_{t-2}^t (1 \times 1) d\tau = \tau \Big|_{t-2}^t$$

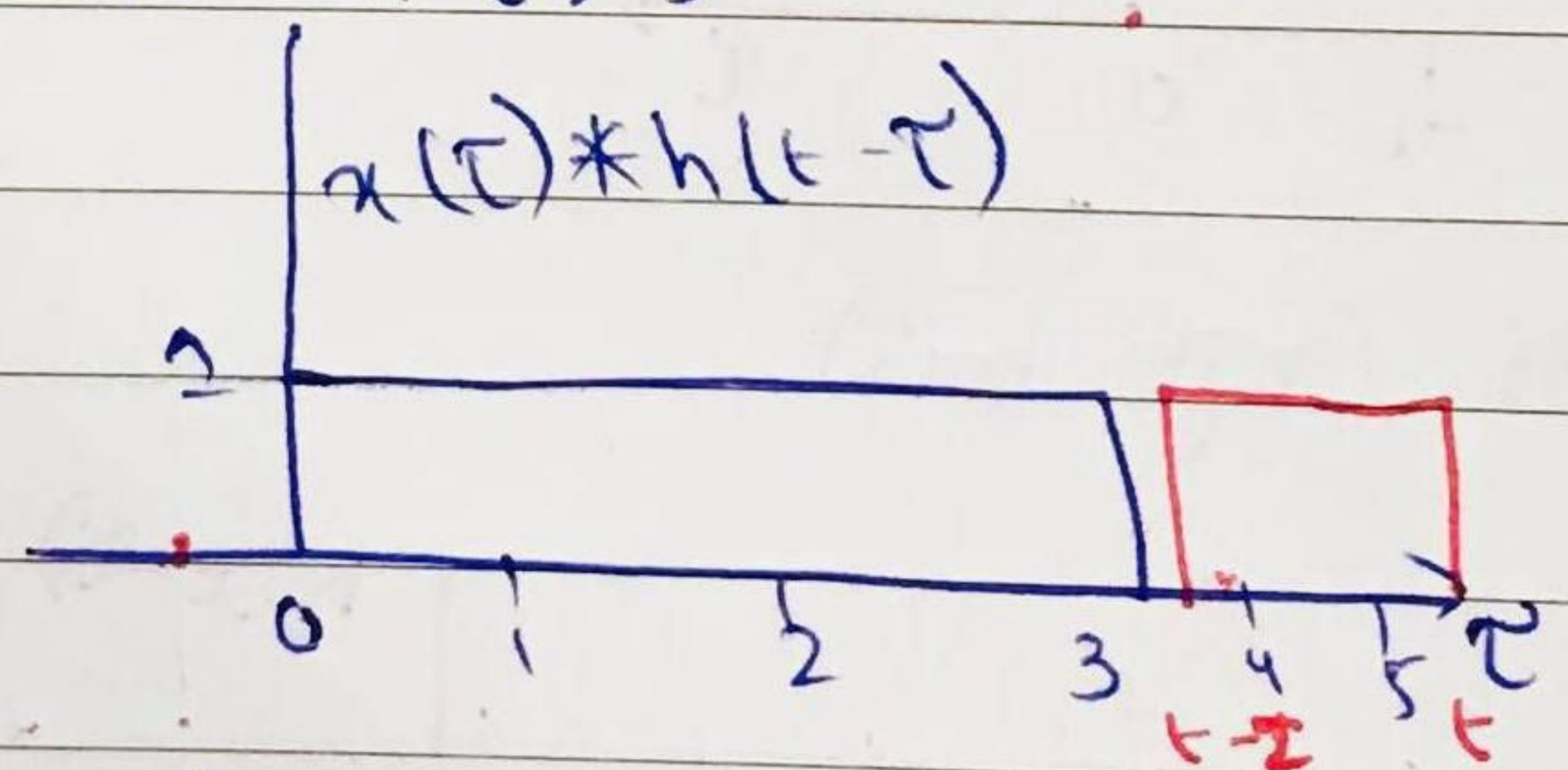
$$= (t - (t-2)) = t - t + 2 \Rightarrow 2$$

⇒ when $4 < t < 5$



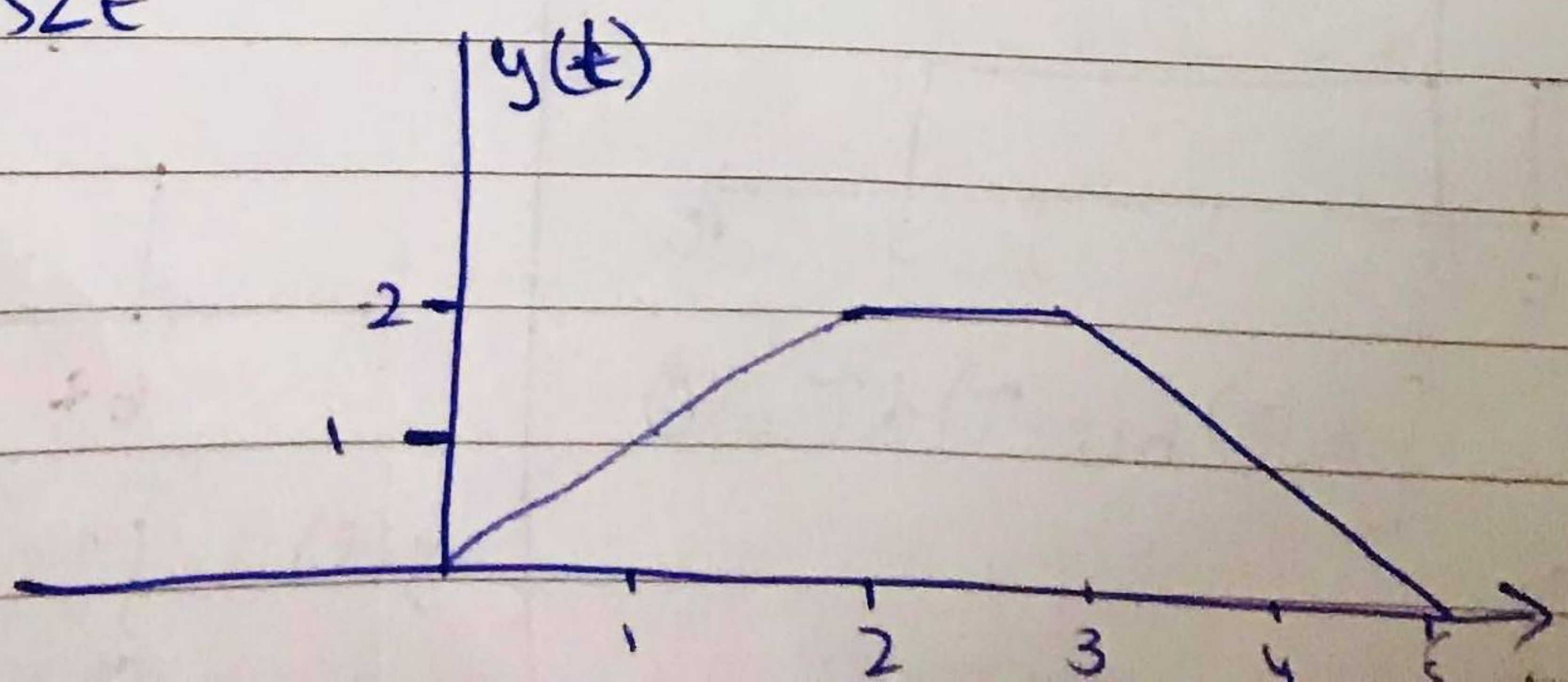
$$y(t) = 5 - t$$

⇒ when $t > 5$



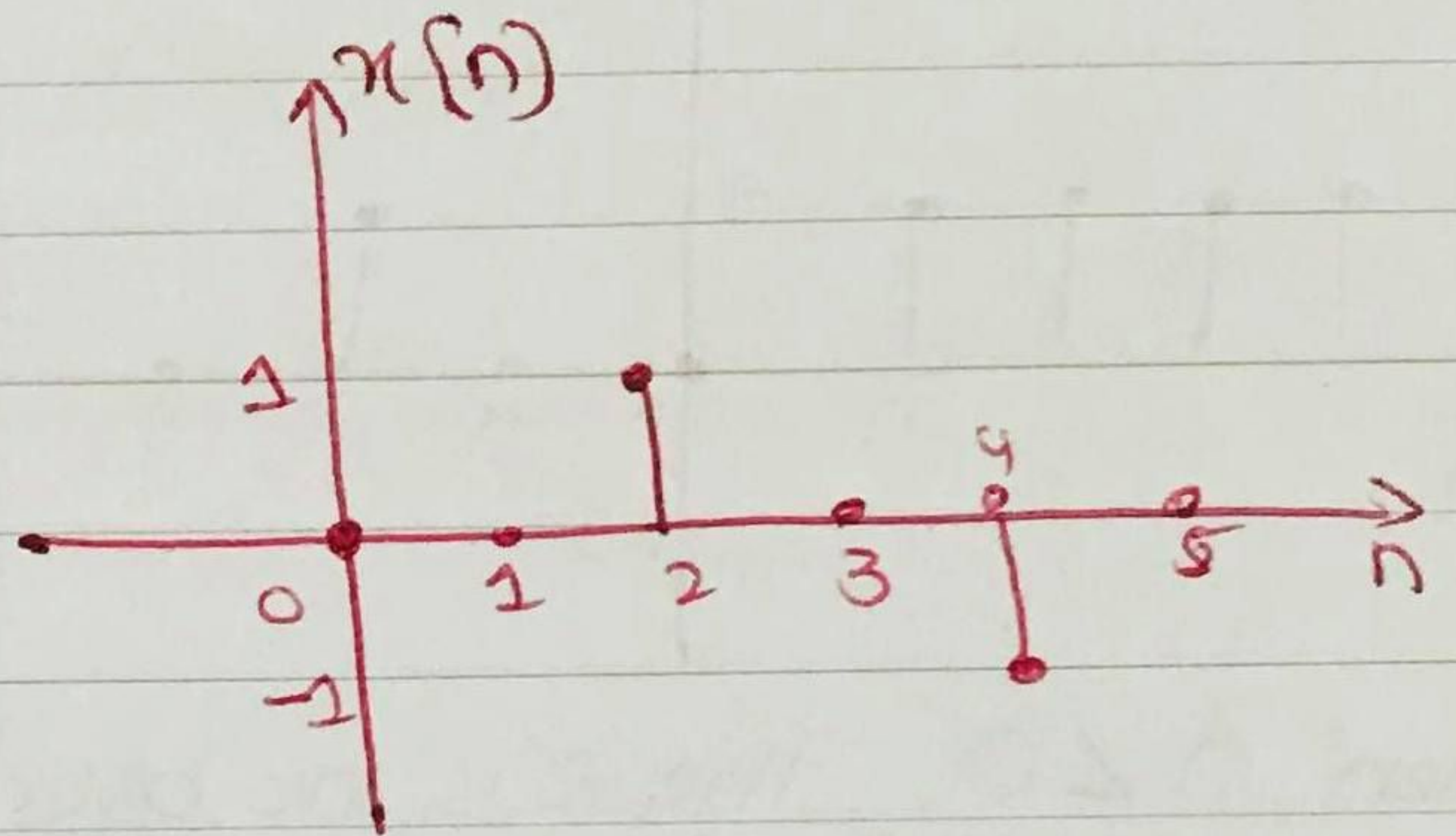
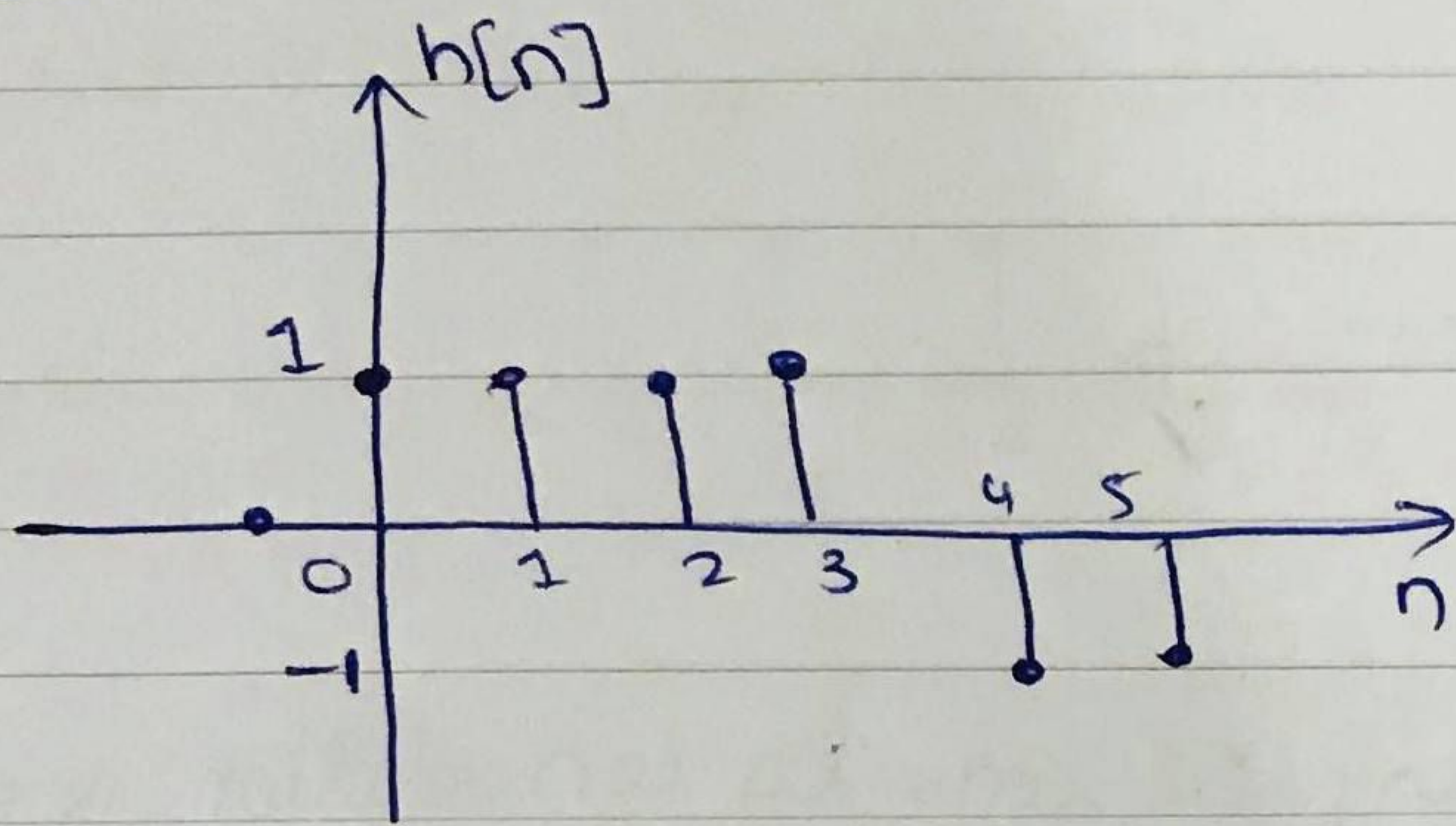
No overlapping $y(t) = 0$

$$y(t) = \begin{cases} 0 & t < 0 \\ t & 0 < t < 2 \\ 2 & 2 < t < 3 \\ 5-t & 3 < t < 5 \\ 0 & 5 < t \end{cases}$$



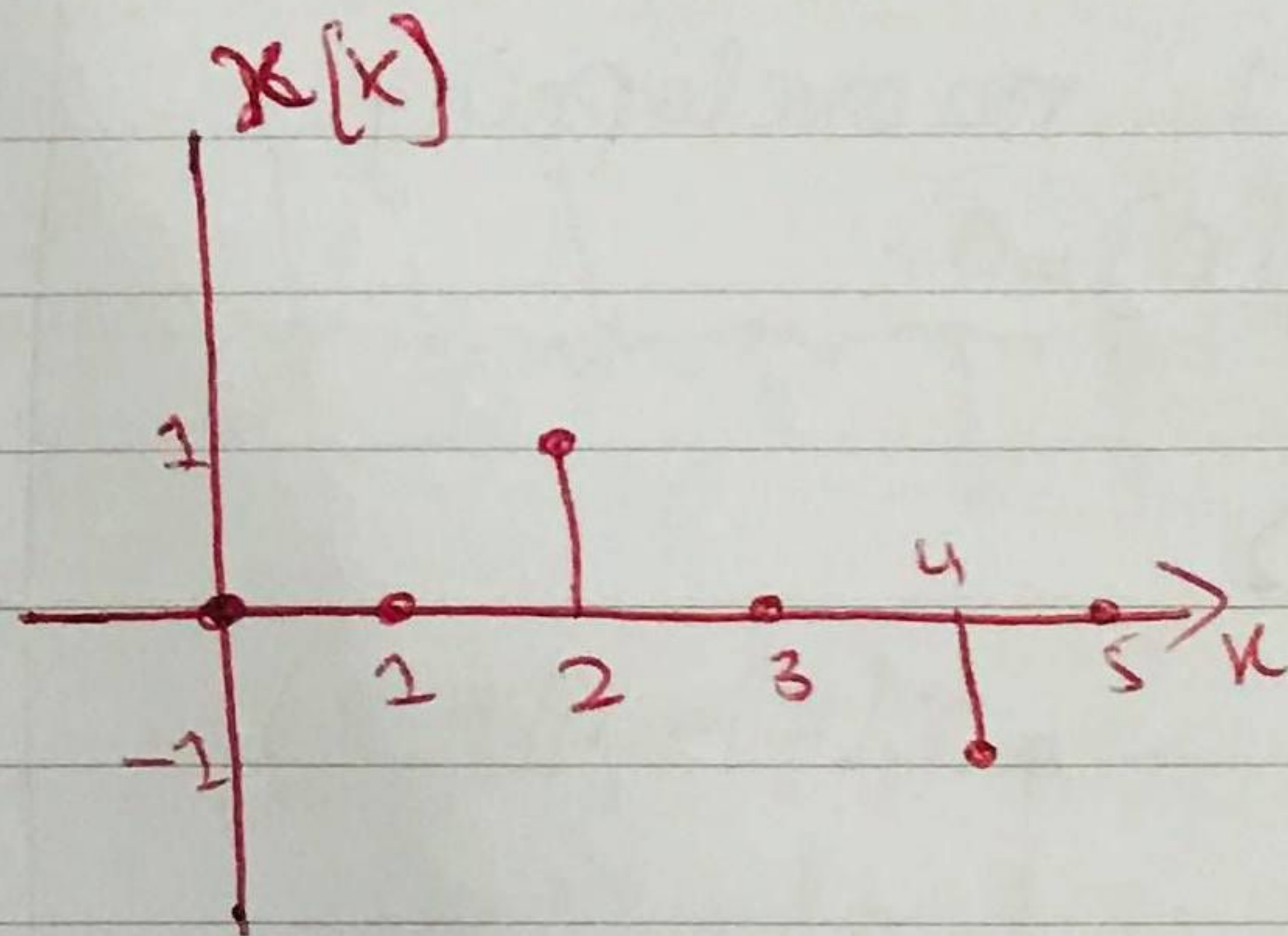
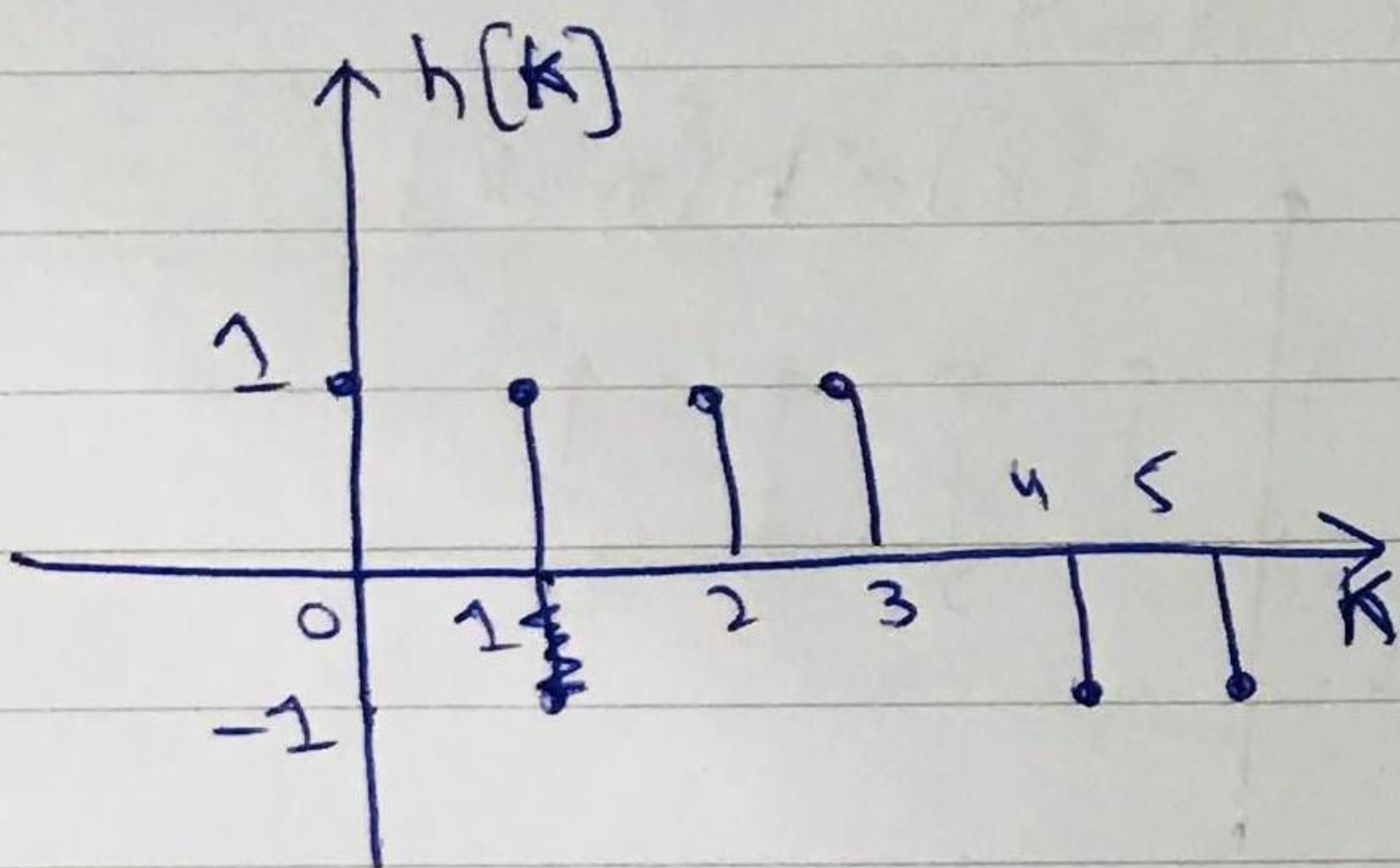
ASSIGNMENTS

Q1:-

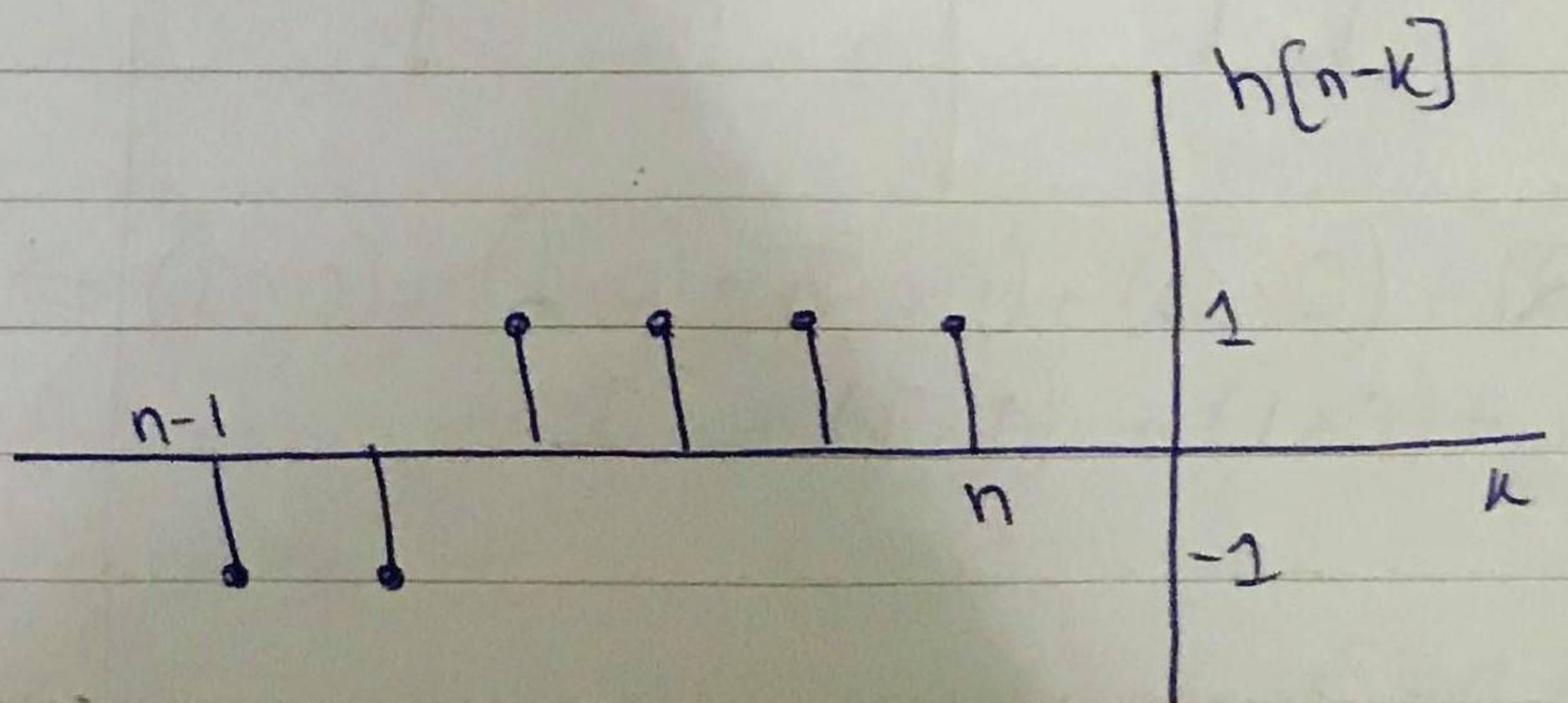
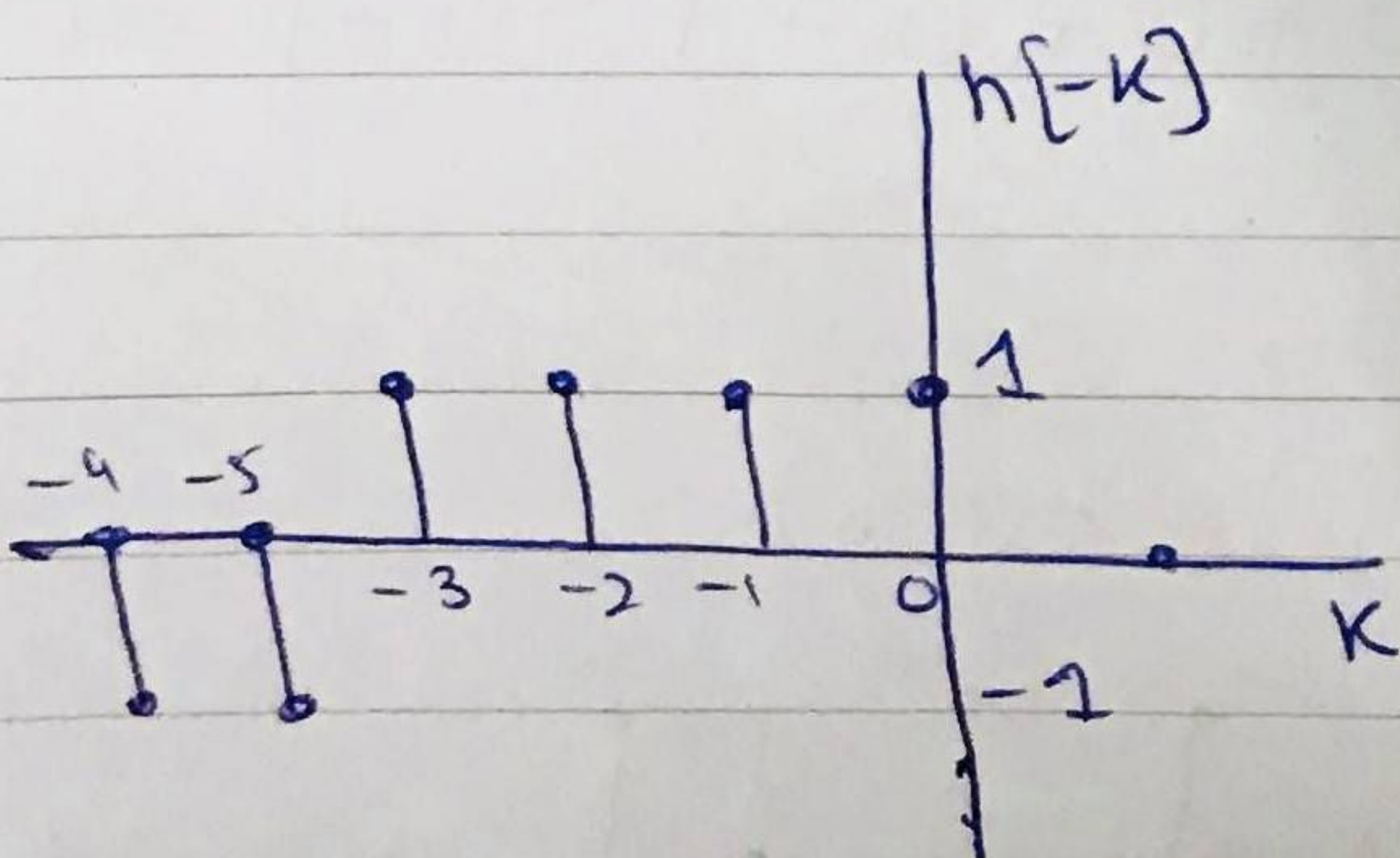


Sol:-

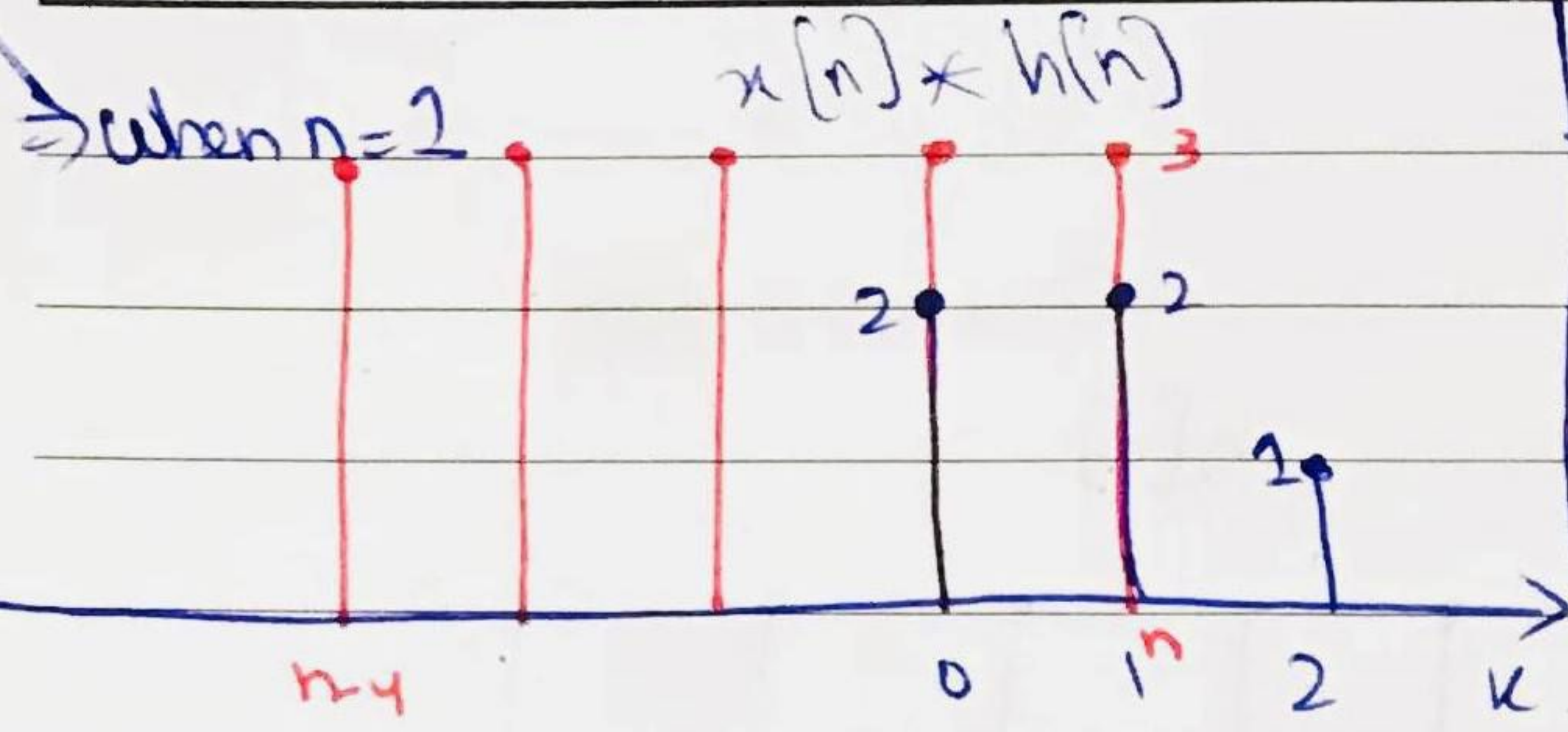
Step 1: replace $n \rightarrow k$



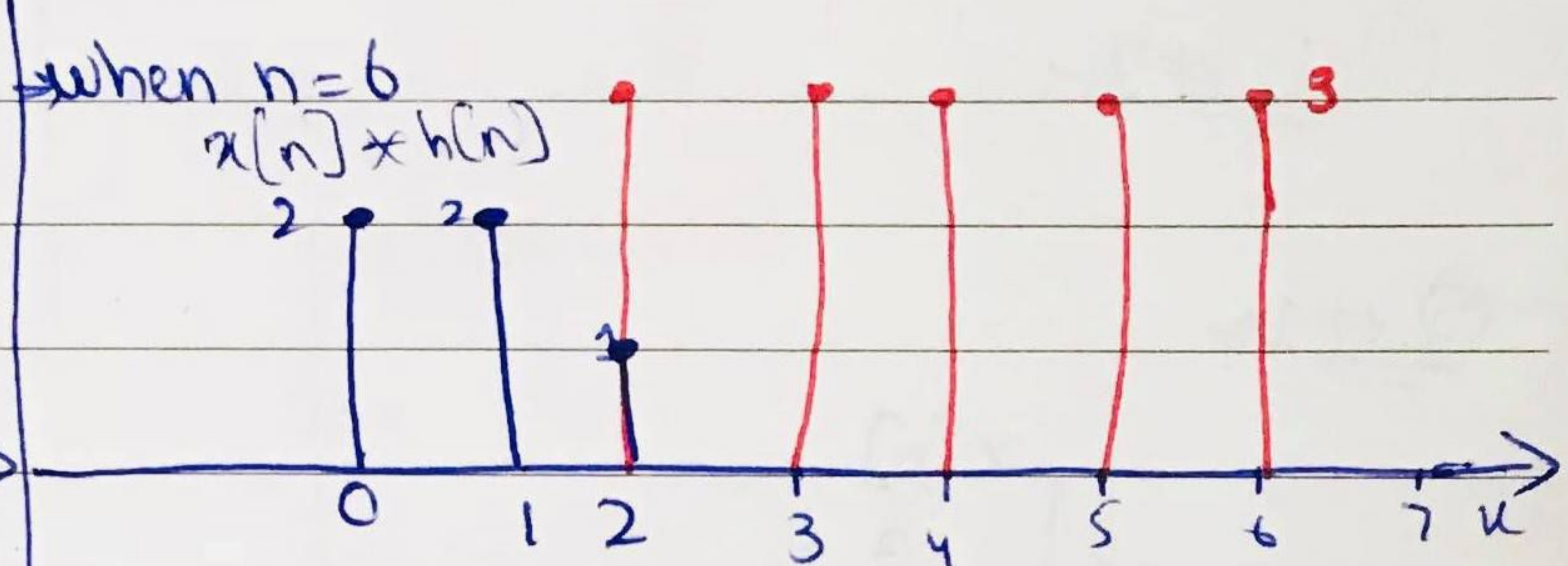
Step 2: flip and shift $h[k]$.



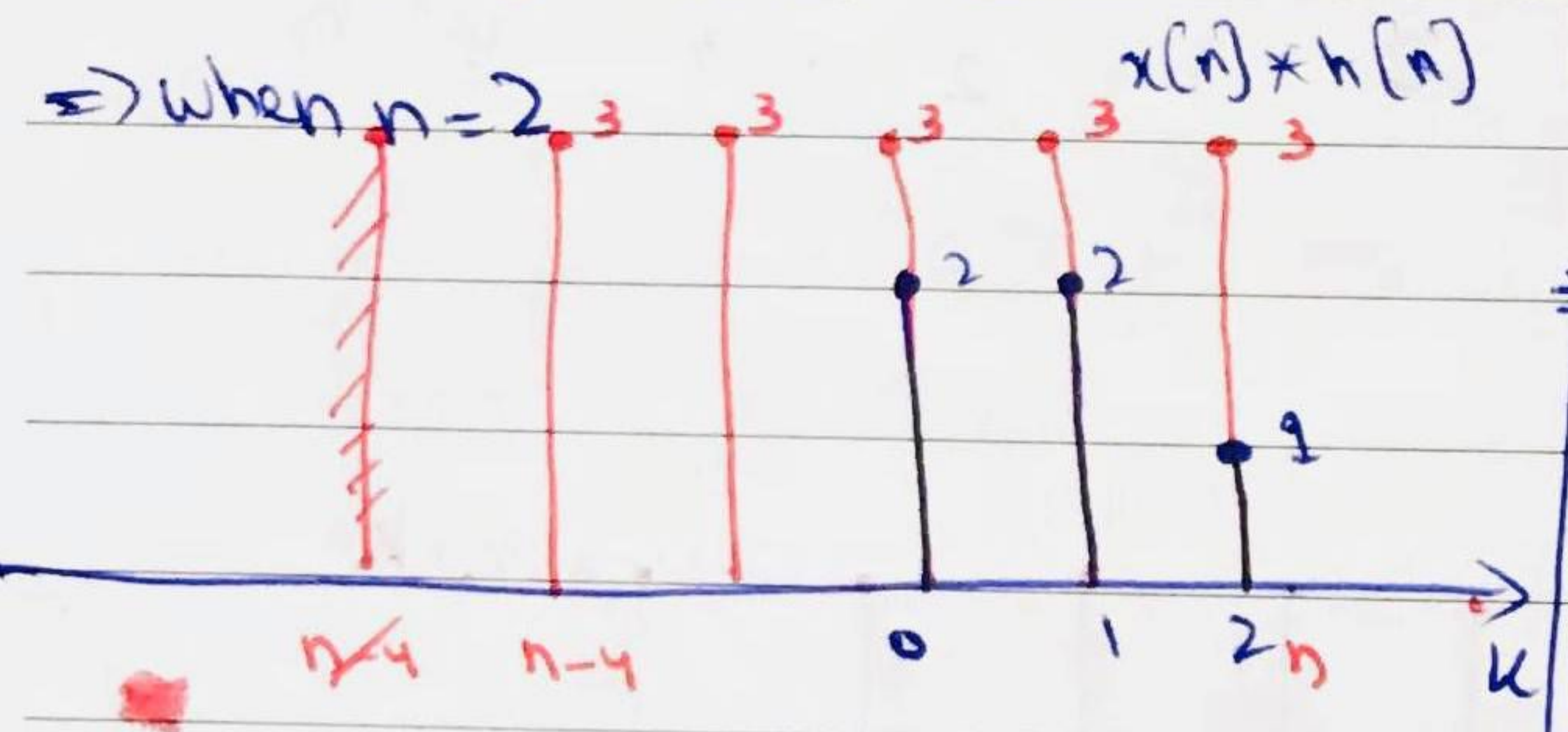
Step 3: Now slide $h[n-k]$ on $x[k]$ and convolve



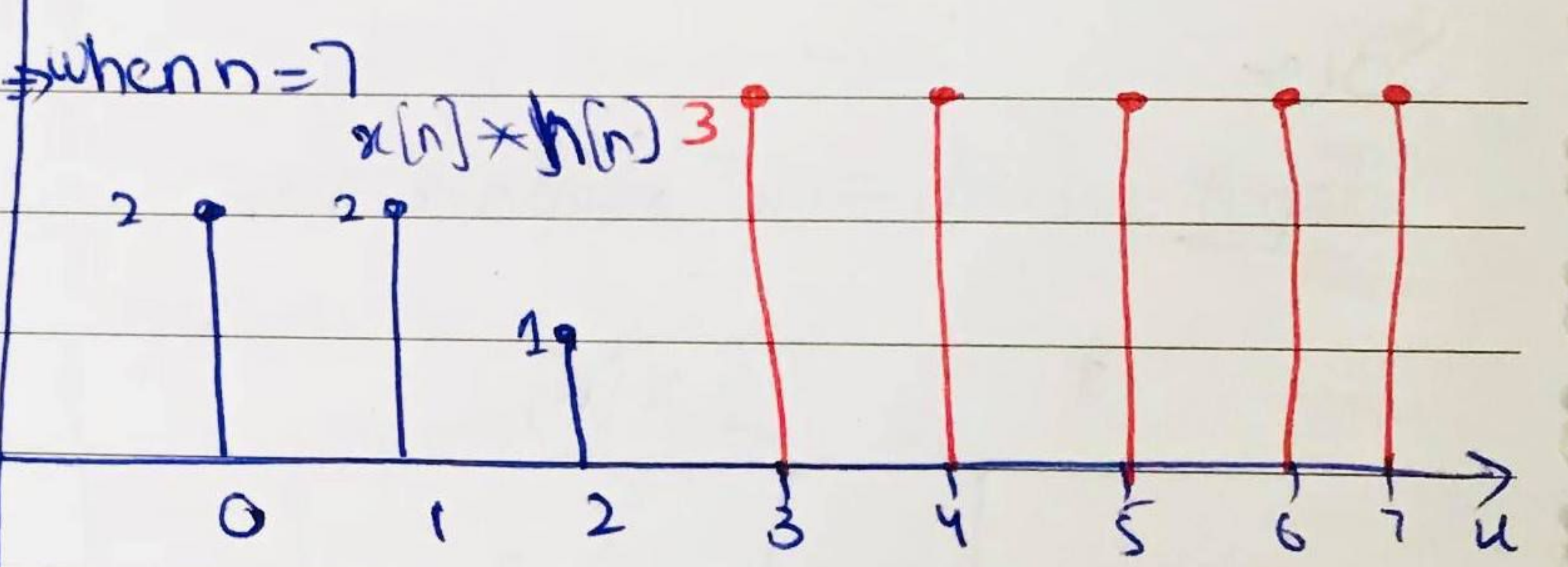
$$y[3] = (2 \times 3) + (2 \times 3) = 6 + 6 \Rightarrow 12$$



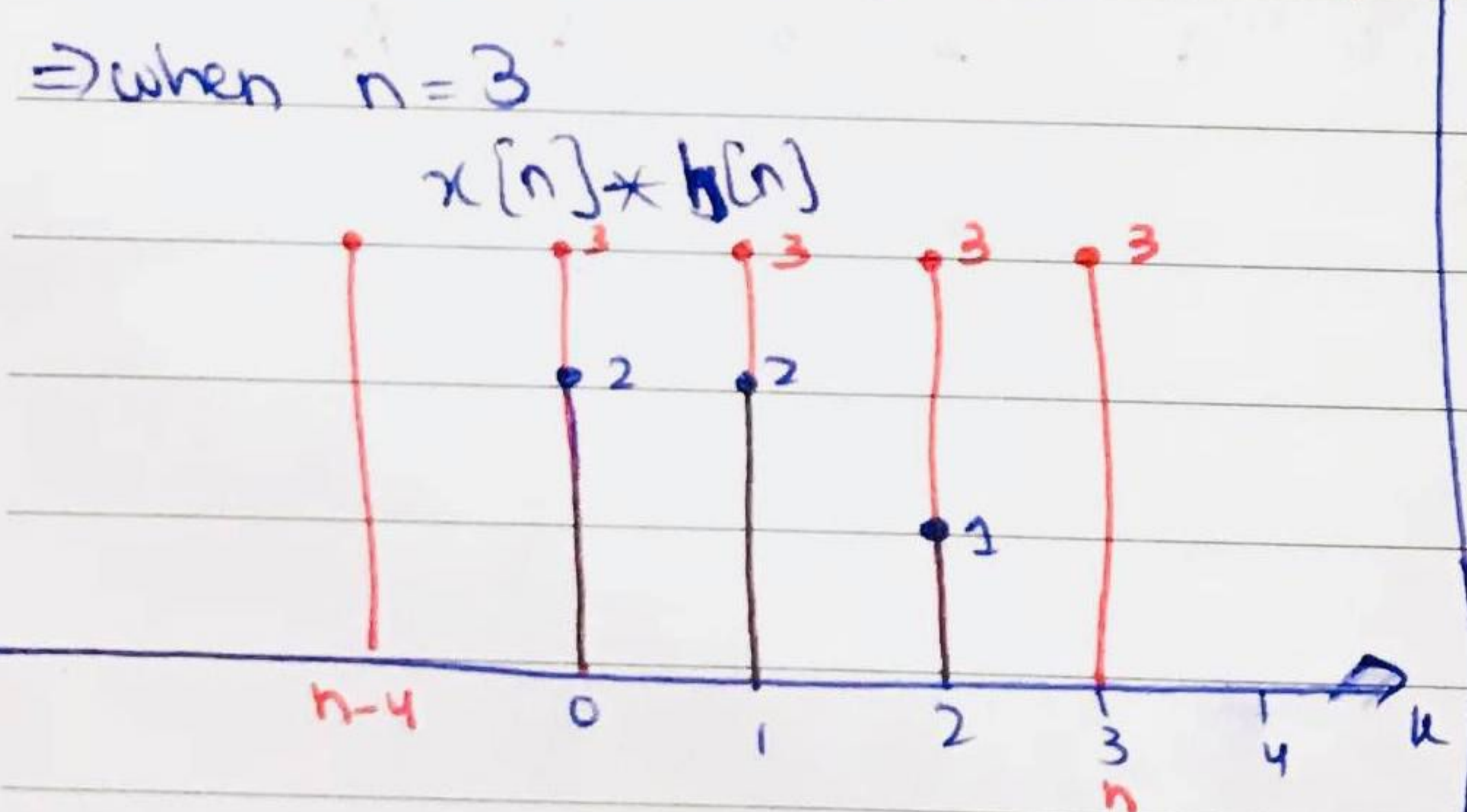
$$y[6] = (3 \times 1) + (0 \times 3) + (0 \times 3) + (0 \times 3) + (0 \times 3) \Rightarrow 3$$



$$y[2] = (2 \times 3) + (2 \times 3) + (3 \times 1) = 6 + 6 + 3 \Rightarrow 15$$

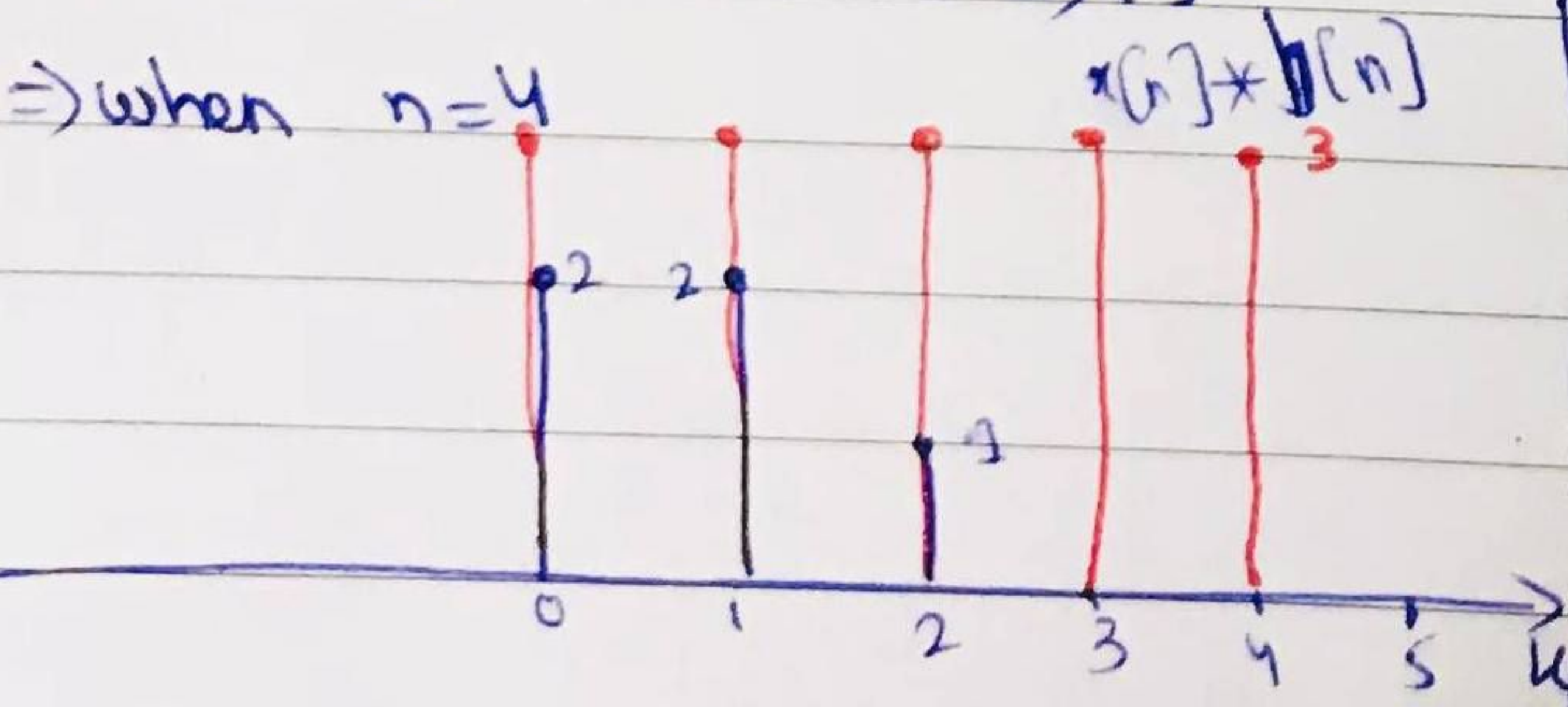
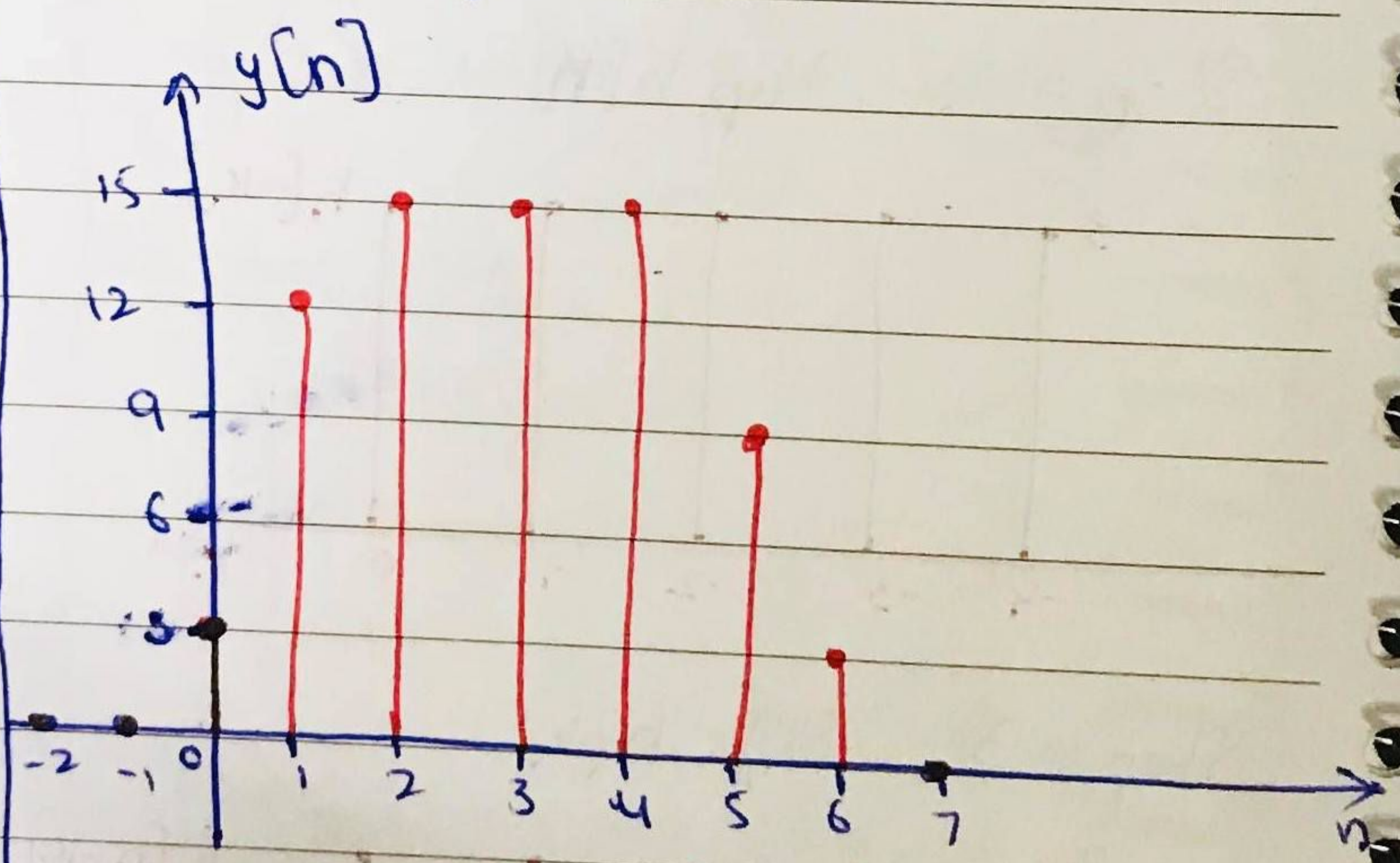


$y[7] = 0$ as there is no overlapping

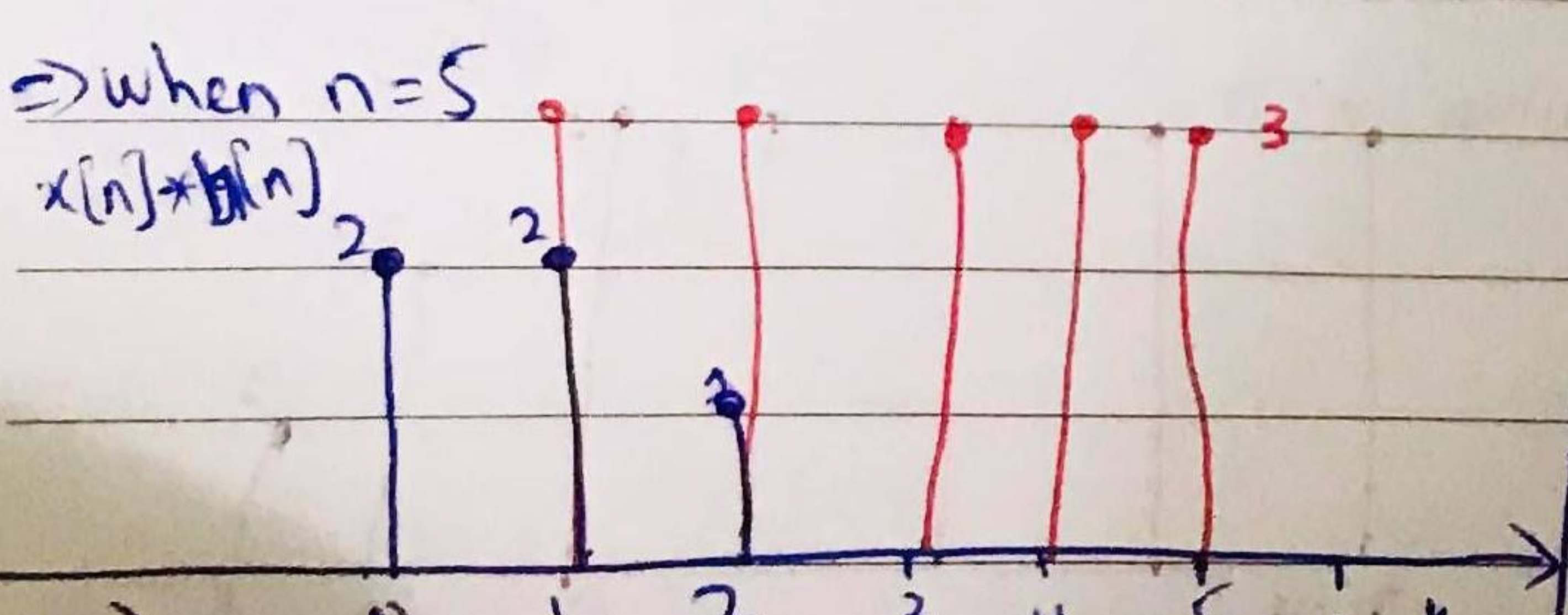


$$y[3] = (2 \times 3) + (2 \times 3) + (1 \times 3) + (0 \times 3) = 6 + 6 + 3 + 0 \Rightarrow 15$$

Final result:-



$$y[4] = (2 \times 3) + (2 \times 3) + (1 \times 3) + (0 \times 3) + (0 \times 3) \Rightarrow 6 + 6 + 3 \Rightarrow 15$$



$$y[5] = (2 \times 3) + (2 \times 3) + (0 \times 3) + (0 \times 3) + (0 \times 3) + (0 \times 3) + (0 \times 3) = 6 + 3 \Rightarrow 9$$