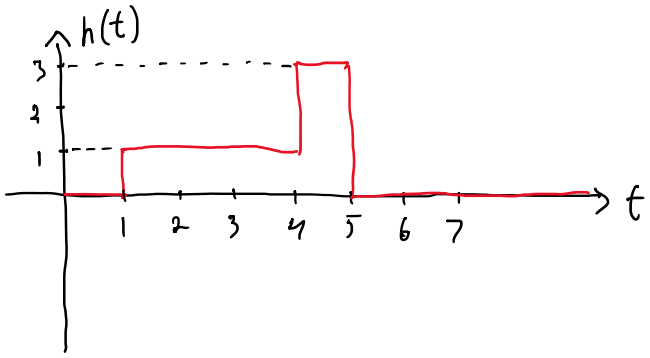
M. Hasyim Abdillah P. (1101191095) TT-43-11

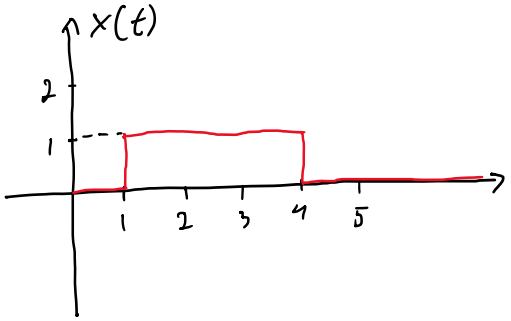
$h(t) = u(t-1) + 2u(t-4) - 3u(t-5)$

$x(t) = u(t-1) - u(t-4)$

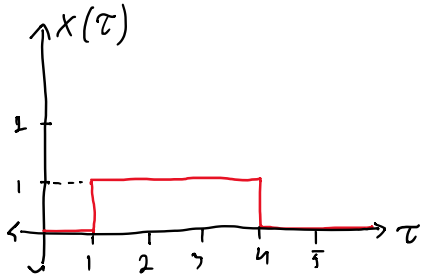
a.

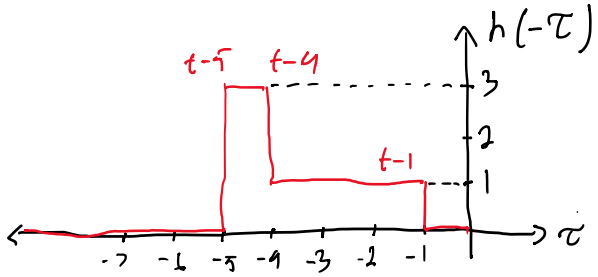


b.

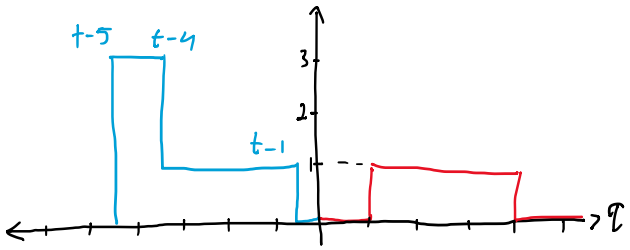


c.



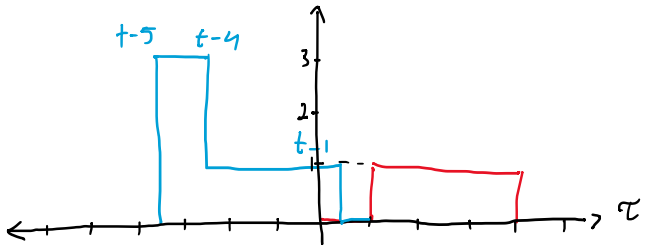


$0 \le t < 1$



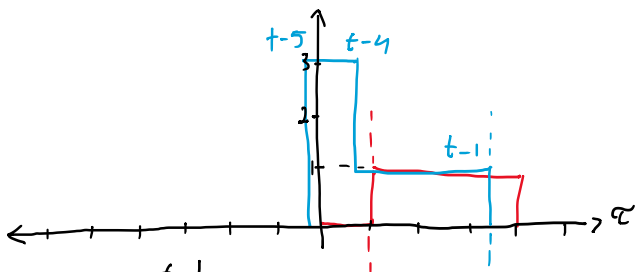
$Y(t) = 0$

$1 \le t < 2$



$Y(t) = 0$

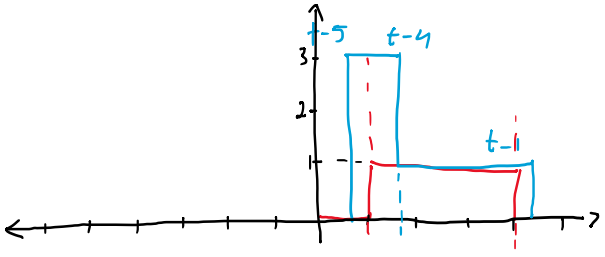
$2 \le t < 5$



$$Y(t) = \int_1^{t-1} 1.1\, d\tau = \tau \Big|_1^{t-1}$$

$$= t - 2$$

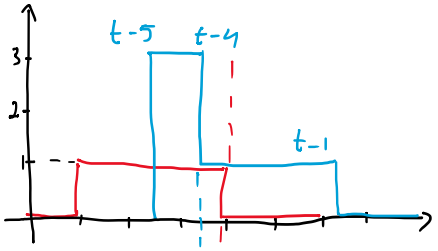
$5 \le t < 6$



$$Y(t) = \int_1^{t-4} 1.3\, d\tau + \int_{t-4}^{4} 1.1\, d\tau$$

$$= 3\tau \Big|_1^{t-4} + \tau \Big|_{t-4}^{4} = 2t - 7$$

$6 \le t < 8$

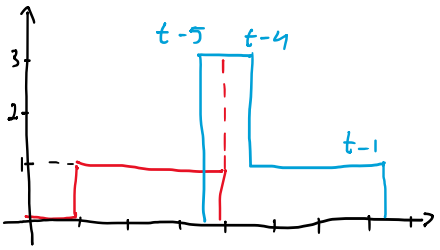


$$Y(t) = \int_{t-5}^{t-4} 1.3\, d\tau + \int_{t-4}^{4} 1.1\, d\tau$$

$$= 3\tau \Big|_{t-5}^{t-4} + \tau \Big|_{t-4}^{4}$$

$$= 11 - t$$

$8 \le t < 9$

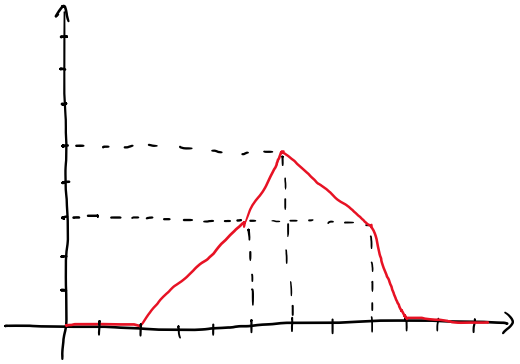


$$Y(t) = \int_{t-5}^{4} 1.3\, d\tau$$

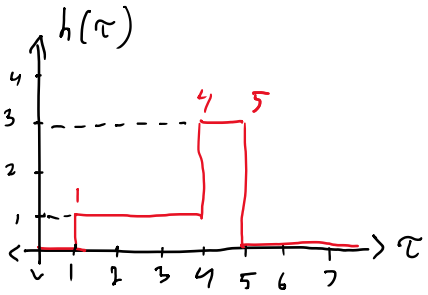
$$= 3\tau \Big|_{t-5}^{4}$$

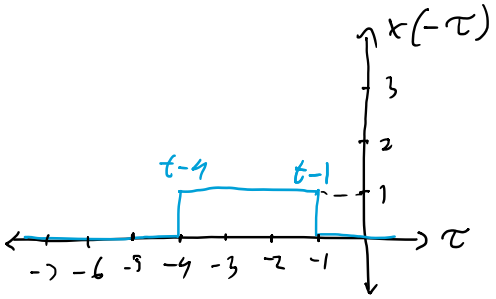
$$= 27 - 3t$$

$$Y(t) \begin{cases} 0, & t < 2 \\ t-2, & 2 \le t < 5 \\ 2t-7, & 5 \le t < 6 \\ 11-t, & 6 \le t < 8 \\ 27-3t, & 8 \le t < 9 \\ 0, & t \ge 9 \end{cases}$$



d.





$0 \le t < 2$

$Y(t) = 0$

$2 \le t < 5$

$$Y(t) = \int_{1}^{t-1} 1.1\, d\tau$$

$$= \tau \Big|_{1}^{t-1}$$

$$= t - 2$$

$5 \le t < 6$

$$Y(t) = \int_{t-4}^{4} 1.1\, d\tau + \int_{4}^{t-1} 1.3\, d\tau$$

$$= \tau \Big|_{t-4}^{4} + 3\tau \Big|_{4}^{t-1}$$

$$= 2t - 7$$

$6 \le t < 8$

$$Y(t) = \int_{t-4}^{4} 1.1\, d\tau + \int_{4}^{5} 3.1\, d\tau$$

$$= \tau \Big|_{t-4}^{4} + 3\tau \Big|_{4}^{5}$$

$$= 11 - t$$

$8 \le t < 9$

$$Y(t) = \int_{t-4}^{5} 3.1\, d\tau$$

$$= 3\tau \Big|_{t-4}^{5}$$

$$= 27 - 3t$$

$t \ge 0$

$Y(t) = 0$

$$Y(t)\begin{cases} 0, & t<2 \\ t-2, & 2\le t<5 \\ 2t-7, & 5\le t<6 \\ 11-t, & 6\le t<8 \\ 27-3t, & 8\le t<9 \\ 0, & t\ge 9 \end{cases}$$