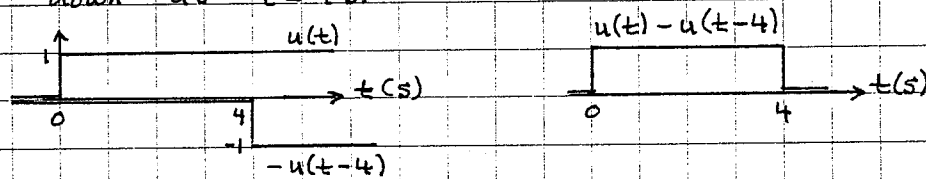


Use step functions to write expression for each function

ans: a) $50 \sin\left(\frac{\pi t}{2}\right) [u(t) - u(t-4)]$

b) $(120 + 30t) [u(t-4) - u(t)] + (120 - 30t) [u(t) - u(t-8)]$
 $+ (-360 + 30t) [u(t-8) - u(t-12)]$

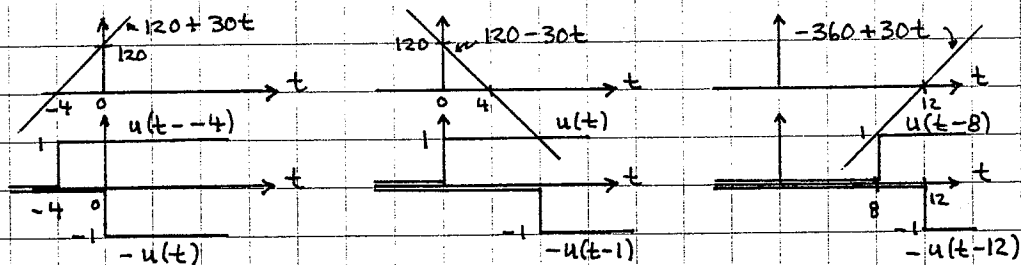
sol'n: a) $f(t)$ exists in a window from $t=0$ to $t=4$.
 We create the window by stepping up at $t=0$ and down at $t=4$.



Thus, our window is $u(t) - u(t-4)$.
 We multiply a sine wave that goes on forever by this window to obtain our desired $f(t)$.

$$f(t) = 50 \sin\left(\frac{\pi t}{2}\right) [u(t) - u(t-4)]$$

b) We use the same window trick, but we use 3 windows:



$$f(t) = (120 + 30t) [u(t-4) - u(t)] + (120 - 30t) [u(t) - u(t-8)]$$

$$+ (-360 + 30t) [u(t-8) - u(t-12)]$$