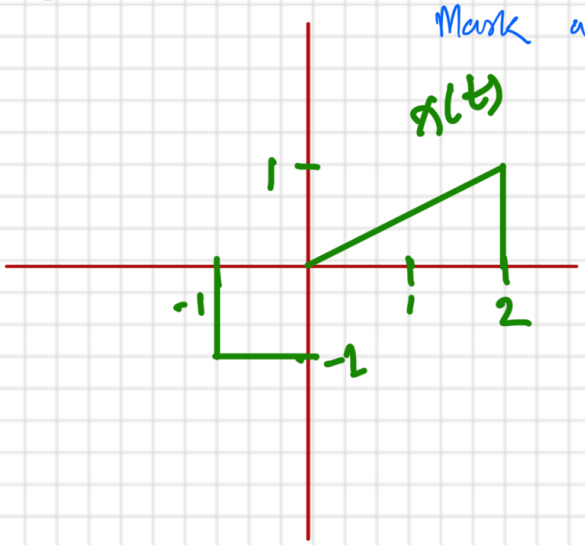
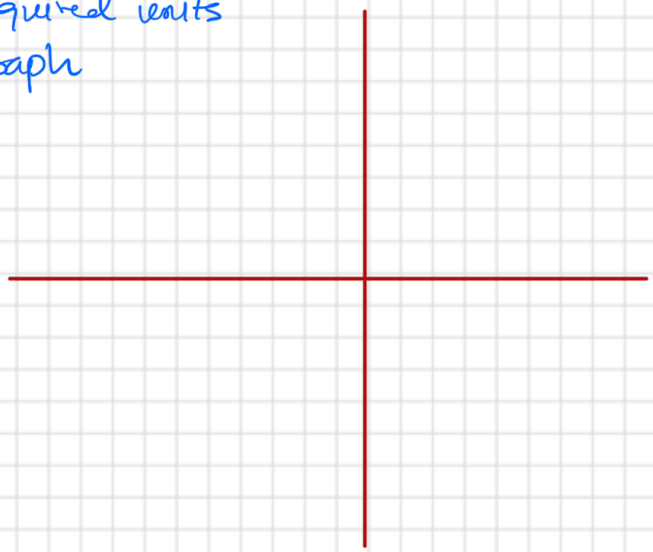
Classwork 05 CPE381 FA2024

Total: 20 pts

① Given $x(t)$, draw $x(-t)$ (6 pts)

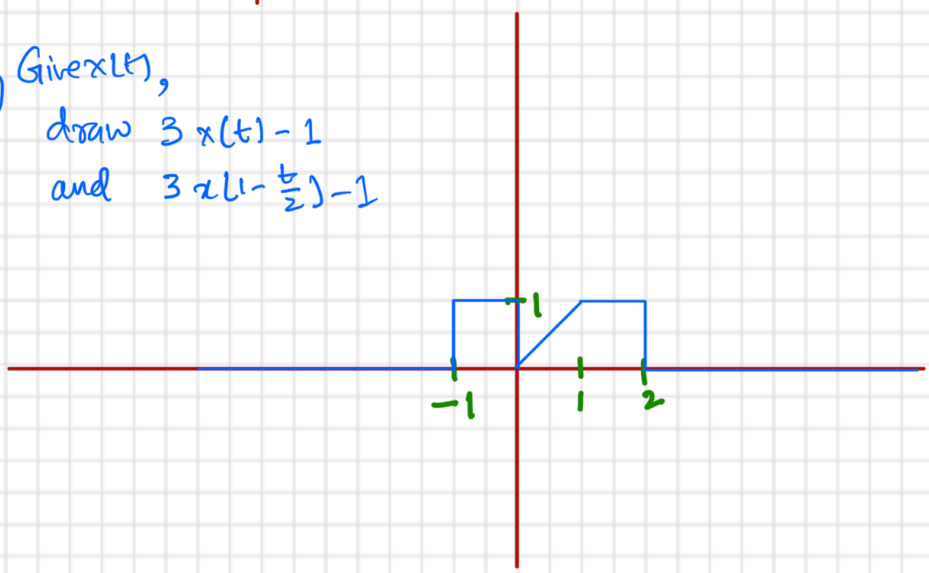
Mark axes with required units as in the graph for $x(t)$

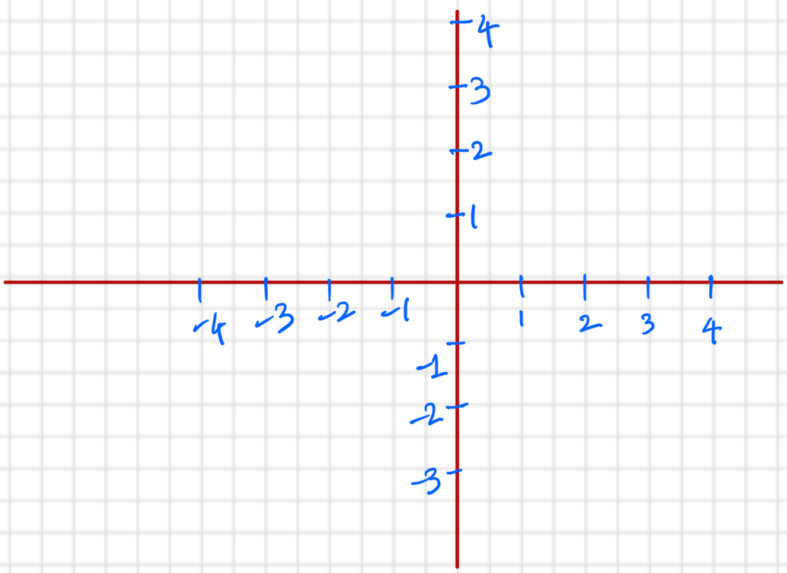


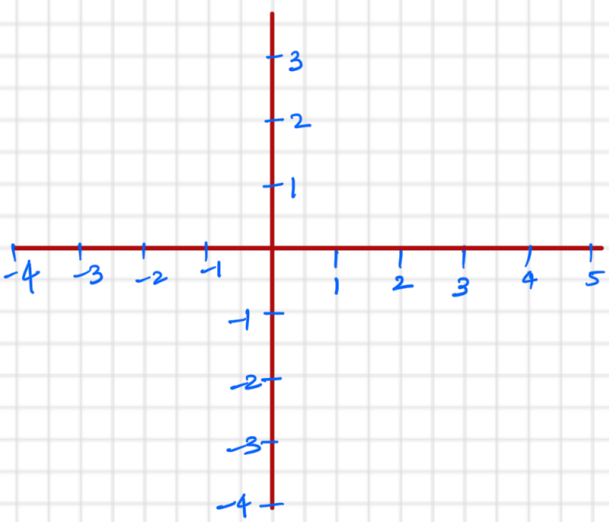


② Give $x(t)$,
draw $3x(t)-1$
and $3x(1-\frac{t}{2})-1$

(4 pts)

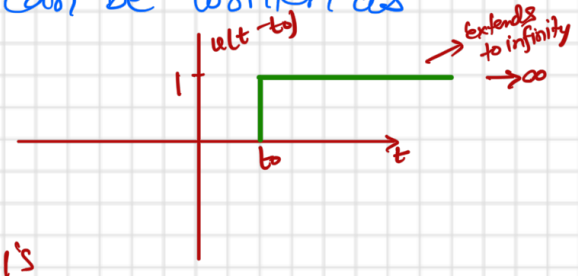






(3) A general unit step function can be written as

(opt) $u(t-t_0) = \begin{cases} 1 & t > t_0 \\ 0 & t < t_0 \end{cases}$



A mathematically useful function is unit rectangular pulse with time period T as shown below:

$$\text{rect}(t/T) = \begin{cases} 1, & -T/2 < t < T/2 \\ 0, & \text{otherwise} \end{cases}$$

(a) Sketch the rect (t/T).

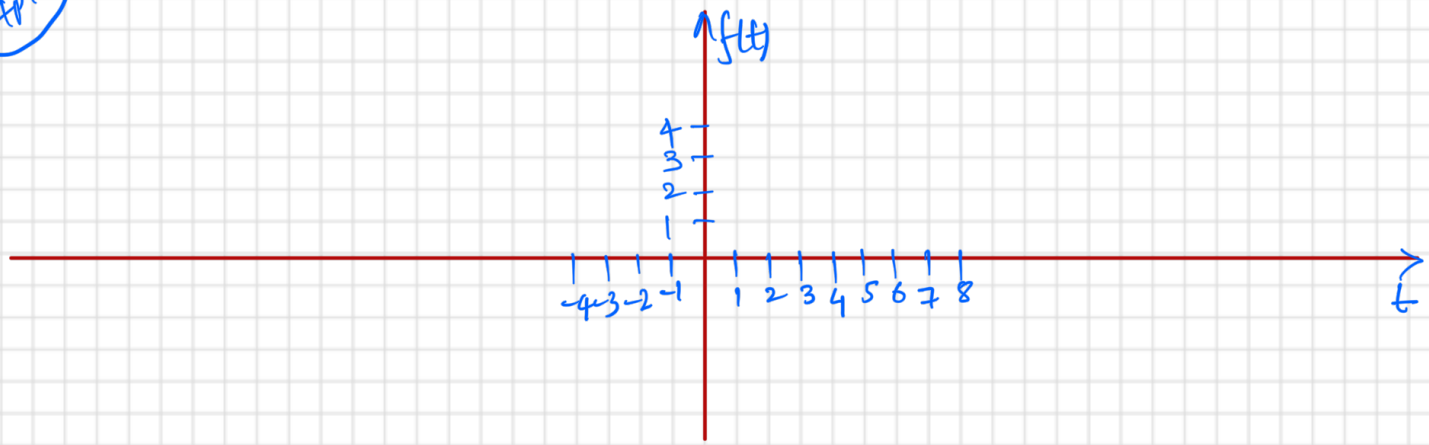
(b) Write down rect (t/T) with $u(t-t_0)$ where you can choose t_0 based on the time period T.

Note : more than one answer is possible.

④ Plot the signal wave from for

4pts

$$f(t) = 3u(t) + tu(t) - [t-1]u(t-1) - 5u(t-2)$$



⑤ Find $\int_{-\infty}^{+\infty} \delta(bt-a)\cos^2(t-c)\,dt$. Hint: Use a change of variable.

4pts