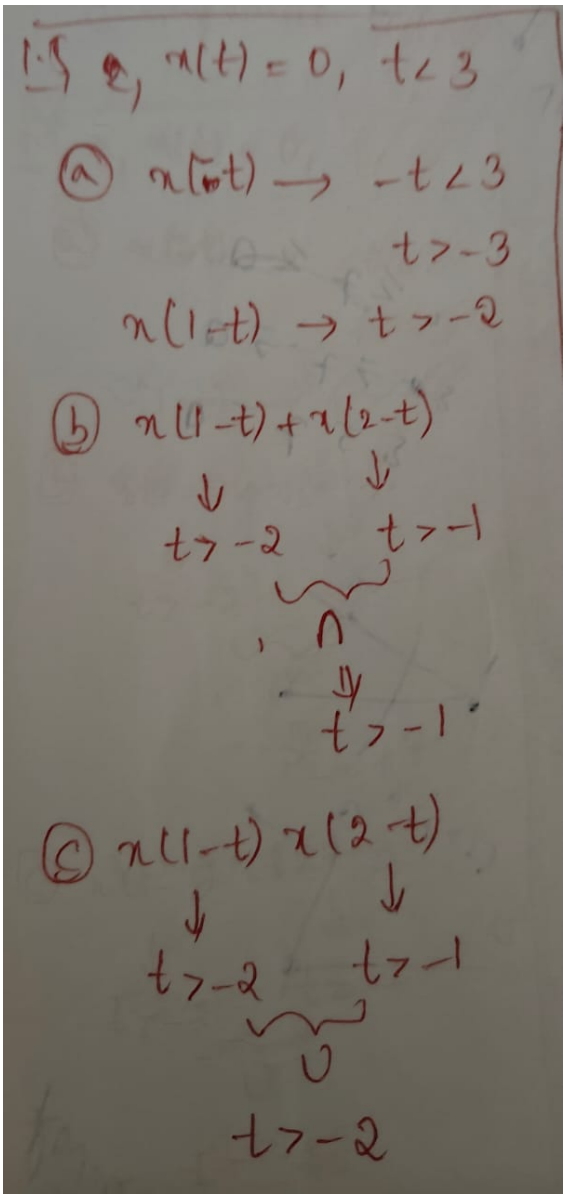
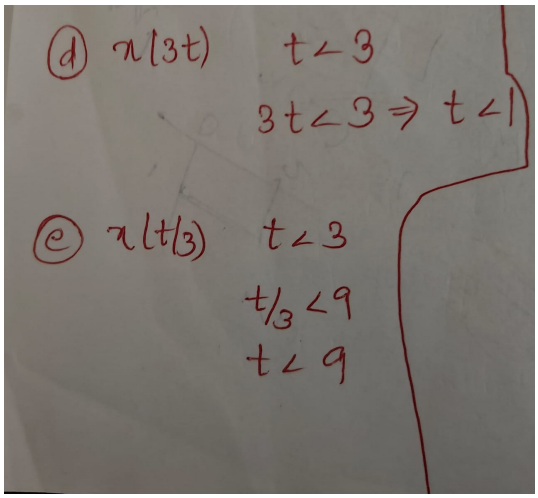
1) Let $x(t)$ be a signal with $x(t) = 0$ for $t < 3$. For each signal given below, determine the values of t for which it is guaranteed to be zero.

(a) $x(1 - t)$ **(b)** $x(1 - t) + x(2 - t)$ **(c)** $x(1 - t)x(2 - t)$

(d) $x(3t)$ **(e)** $x(t/3)$

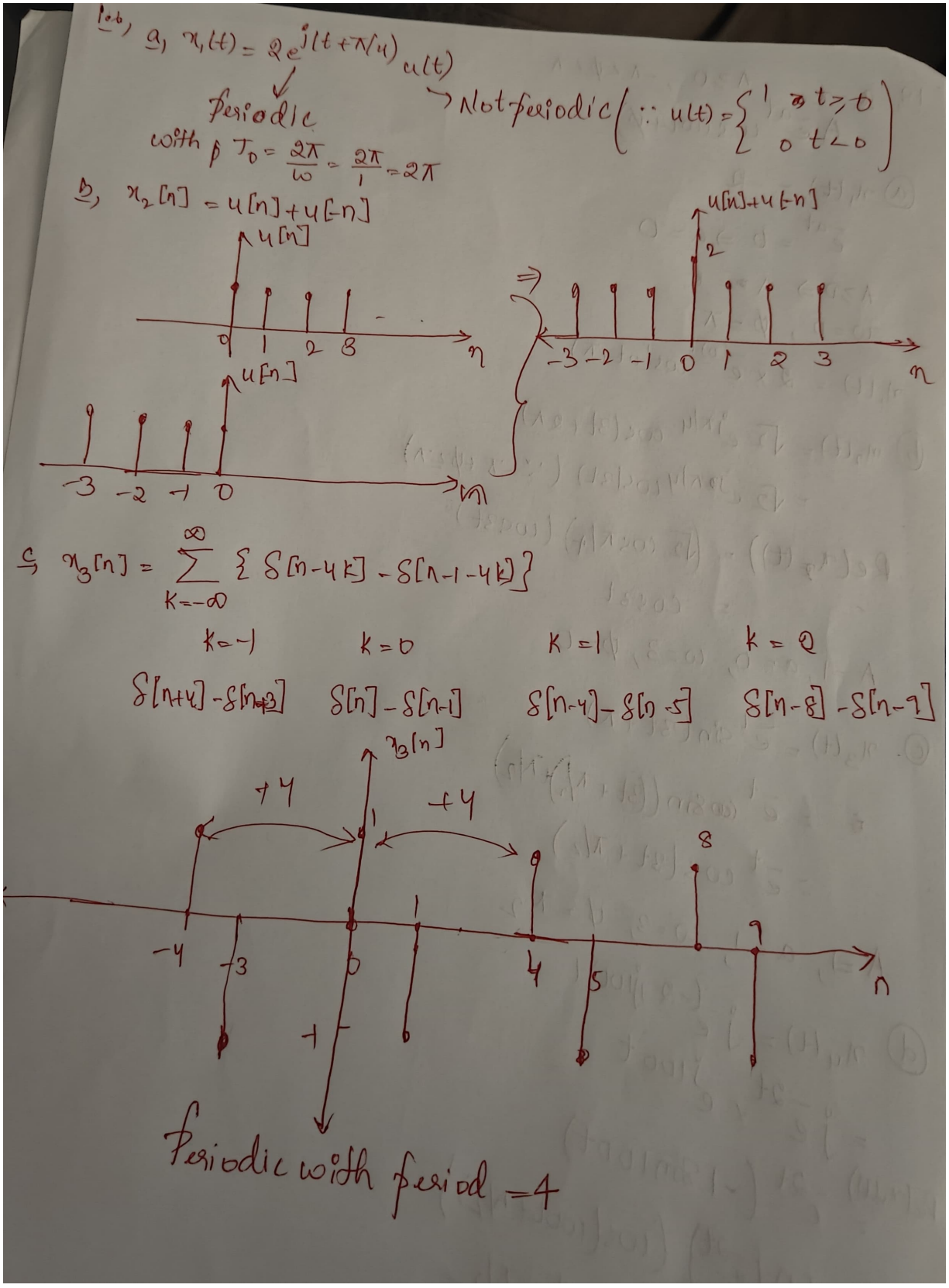




2) Determine whether or not each of the following signals is periodic:

(a) $x_1(t) = 2e^{j(t+\pi/4)}u(t)$ **(b)** $x_2[n] = u[n] + u[-n]$

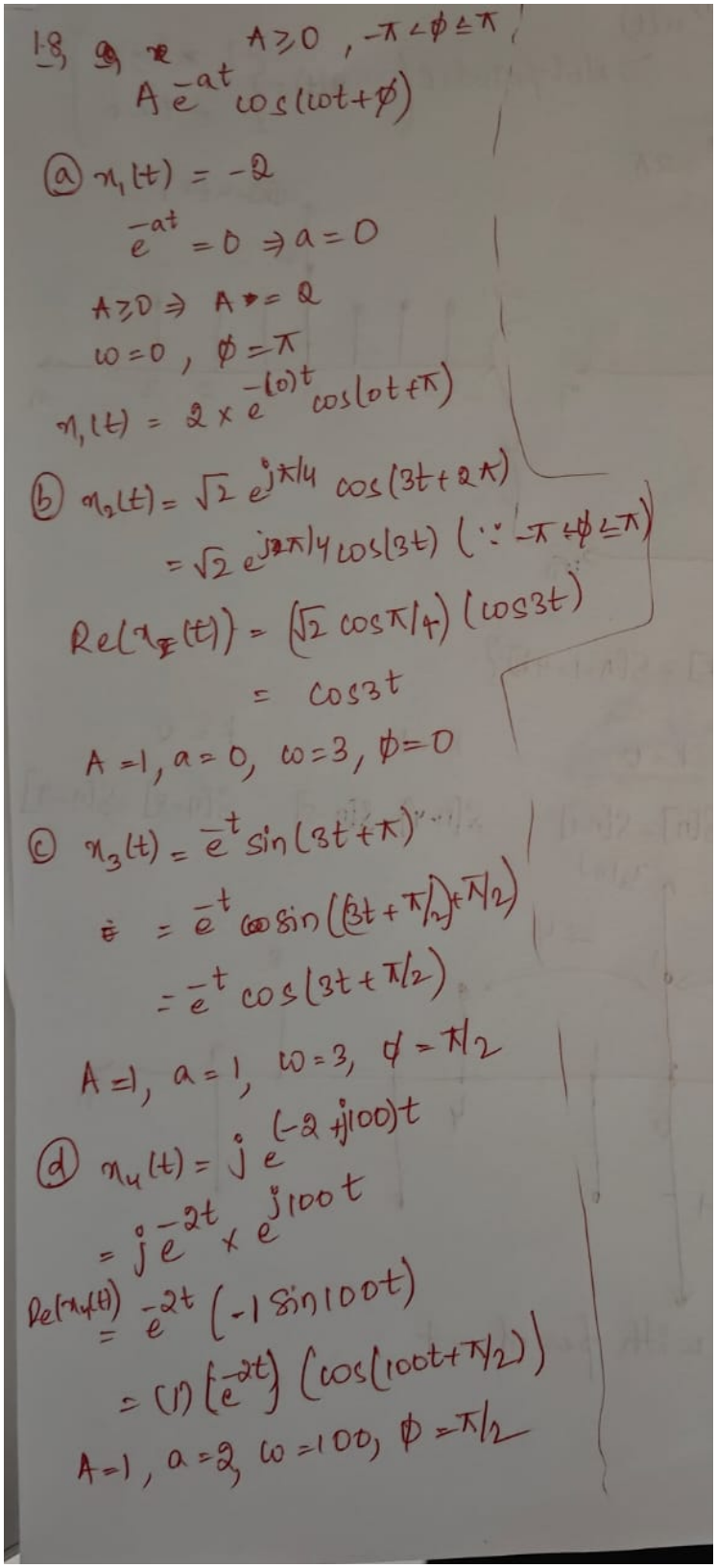
(c) $x_3[n] = \sum_{k=-\infty}^{\infty}\{\delta[n-4k] - \delta[n-1-4k]\}$



3) Express the real part of each of the following signals in the form $Ae^{-at}\cos(\omega t + \phi)$, where A, a, ω, and ϕ are real numbers with $A \geq 0$ and $-\pi < \phi \leq \pi$:

(a) $x_1(t) = -2$ **(b)** $x_2(t) = \sqrt{2}e^{j\pi/4}\cos(3t + 2\pi)$

(c) $x_3(t) = e^{-t}\sin(3t + \pi)$ **(d)** $x_4(t) = je^{(-2+j100)t}$



SOME EXTRA QUESTIONS FOR PRACTICE:

http://materias.df.uba.ar/l5a2021c1/files/2021/05/Alan-V.-Oppenheim-Alan-S.-Willsky-with-S.-Hamid-Signals-and-Systems-Prentice-Hall-1996.pdf

Solve 1.5 ,1.6 .