

Exercise 4.107

Answer (e).

We are given a LTI system with impulse response

$$h(t) = (t+4)^2 [u(t+5) - u(t+3)].$$

In other words, we have

$$h(t) = \begin{cases} (t+4)^2 & -5 \leq t < -3 \\ 0 & \text{otherwise.} \end{cases}$$

rectangular pulse

write as 2 cases

Clearly, $h(t)$ is nonzero for $-5 \leq t < -3$ (excluding $t = -4$). Since $h(t) \neq 0$ for some $t \neq 0$, the system has memory. Since $h(t) \neq 0$ for some $t < 0$ (e.g., $t = -3.5$), the system is not causal.