COMMUNICATION THEORY, Homework Assignment 2, Fall 2023

An input signal $x(t)$ is sent through three different communication channels, and the corresponding output signals are found to have the following expressions:

$$y(t) = x(t) - 0.1x(t-2)$$

$$z(t) = x(t/3)$$

$$w(t) = x^2(t)$$

For each of these channels, verify mathematically if the channel is linear time-invariant (LTI), and in that case write an expression of the channel impulse response $h(t)$ and transfer function $H(f)$, also known as frequency response.