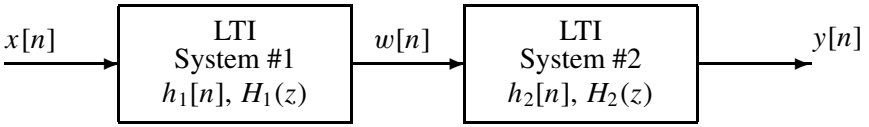
PROBLEM:

A cascade of two discrete-time systems is depicted by the following block diagram:



The systems are defined by the following:

$$H_1(z) = (1 - z^{-2}) \quad \text{and} \quad h_2[n] = (-0.8)^{n-1}u[n-1].$$

(a) If the input to the first system is

$$x[n] = \delta[n] - 2\delta[n-1] + \delta[n-2],$$

determine the output, $w[n]$, of the **first** system.

$w[n] =$

(b) Determine the system function $H(z)$ of the overall system.

$H(z) =$