PROBLEM:

In the following cascade of systems, all of the individual transfer functions are known.

$$x[n]$$
 $H_1(z)$ $v_1[n]$ $H_2(z)$ $v_2[n]$ $U_3(z)$ $v_3[n]$ v_3

 $H_1(z) = z^{-2} + z^{-3}$ $H_2(z) = 4 - 3z^{-1}$

(a) Determine H(z) the z-transform of the cascaded system. Simplify H(z) by cancelling common factors in the numerator and denominator.

 $\delta[n]$. Prove that the impulse response has the form $h[n] = G \alpha^n$ for $n \ge 3$. Find values for α and G.

(b) Consider the impulse response of the cascaded system, i.e., the response y[n] when the input is x[n] =