PROBLEM:

A *unit impulse sequence* is defined as

$$\delta[n] = \begin{cases} 1 & n = 0 \\ 0 & n \neq 0 \end{cases}$$

Suppose that a LTI system has system function equal to

$$H(z) = 6 + 3z^{-2} - 7z^{-4} + 13z^{-6} + 9z^{-8}$$

(a) Determine the difference equation that relates the output $y[n]$ of the system to the input $x[n]$.

(b) Determine and plot the *impulse response*: i.e., the output sequence $y[n]$ when the input is $x[n] = \delta[n]$. How is the output due to an impulse related to $H(z)$?