PROBLEM:

A linear time-invariant system has system function given by

$$H(z) = \sum_{n=0}^{5} z^{-n} = \frac{1 - z^{-6}}{1 - z^{-1}}$$

(a) Plot the poles and zeros of $H(z)$ in the complex z-plane.

(b) Use the summation form for $H(z)$ to determine a difference equation that relates the output $y[n]$ to the input $x[n]$ of the above system. The equation should involve only samples of the input.

(c) Use the second form to determine another difference equation that relates the output $y[n]$ to the input $x[n]$ of the above system. In this case the equation should involve both input and output samples.