Test 2 - No.2

DSP

Exercises

1. Consider the system described by the following system function:

$$H(z) = \frac{1 + z^{-1}}{1 - 0.6z^{-1}}$$

   a. (2p) Indicate the poles and the zeros, and draw the pole-zero diagram (with the unit circle)
   b. (3p) Find the difference equation of the system

$$y[n] = ...$$

2. A causal signal $x[n]$ has Z transform

$$X(z) = \frac{1}{(1 + 0.2z^{-1})(1 - 0.4z^{-1})}$$

.

   a. (4p) Find the signal $x[n]$

It is known that:

$$a^n \cdot u[n] \quad \overset{\text{Z}}{\longleftrightarrow} \quad \frac{1}{1 - a \cdot z^{-1}} = \frac{z}{z - a}, ROC : |z| > |a|$$

$$-a^n \cdot u[-n - 1] \quad \overset{\text{Z}}{\longleftrightarrow} \quad \frac{1}{1 - a \cdot z^{-1}} = \frac{z}{z - a}, ROC : |z| < |a|$$