Homework 7: due 03/09/18

EE 324: Signals and Systems II

1 Unilateral z transform (need to specify ROC)

1. $x[n] = n\cos(\frac{\pi}{3}(n-1))u[n-2]$
2. $x[n] = 2^{n-1}\sin(\frac{\pi}{3}(n-1))u[n-1]$
3. $x[n] = n^2 * n2^{n-1}\sin(\frac{\pi}{3}(n-1))u[n-1]$

2 Inverse z transform

1 . $X(z) = \frac{1}{1+1.1z^{-1}+0.3z^{-2}}$
2. $X(z) = \frac{1}{1+2.2z^{-1}+1.2z^{-2}}$
3. $X(z) = \frac{4-\frac{1}{4}z^{-1}+\frac{1}{36}z^{-2}}{(1+\frac{1}{4}z^{-1})(1-\frac{2}{3}z^{-1}+\frac{1}{9}z^{-2})}$

3 Transfer function

Derive the transfer functions of the following systems and plot their block diagrams using z^{-1} units.

1. $y[k] - 0.7y[k-1] + 0.5y[k-2] = x[k]$
2. $y[k+1] - 0.7y[k] + 0.5y[k-1] = x[k+1] + x[k] - 0.5x[k-1]$