Name Answers

EE-3221 – Dr. Durant – Quiz 6
Winter 2020-'21, Week 7

This is an ***open***-book quiz. You may use a calculator. You may refer to your homework that is due today.

Find the inverse z-transform of $X(z) = \frac{-z}{z^2+0.2z-0.24}$

Solve for poles (roots of denominator):

$z^2 + 0.2z - 0.24 = 0$

$z = \frac{-0.2 \pm \sqrt{0.04+0.96}}{2} = \frac{-0.2 \pm 1}{2} = -0.6, +0.4$

$\frac{X(z)}{z} = \frac{-1}{z^2+0.2z-0.24} = \frac{A}{z+0.6} + \frac{B}{z-0.4}$

$-1 = A(z-0.4) + B(z+0.6)$

$-1 = (A+B)z + (-0.4A + 0.6B)$

$A + B = 0$

$-0.4A + 0.6B = -1$

$+0.4B + 0.6B = -1$

$B = -1 \rightarrow A = 1$

$X(z) = \frac{z}{z+0.6} - \frac{z}{z-0.4}$

$x(n) = \left((-0.6)^n - (0.4)^n\right) u(n)$