

Exercises Week 5

DSP

1. Compute the convolution of the two signals $x_1[n] = (-2) \left(\frac{1}{3}\right)^n u[n]$ and $x_2[n] = 7 \left(\frac{-1}{5}\right)^n u[n]$ using the Z transform (Hint: Compute the Z transforms of the two signals, multiply, then do the inverse Z transform of the result via partial fractions decomposition)
2. Find all the signals $x[n]$ which have the Z transform

$$X(z) = \frac{7}{(1 - 2z^{-1})(1 + 0.5z^{-1})}$$