Z-Transforms:

1. Find the z transform of the following signals:

a) x[n] = u[n] - u[n-4]

b) $x[n] = 0.5^n u[n]$

c) x[n] = [1 4 8 2]

d) x[n] = [0 1 2 3 4]

e) $x[n] = 2(0.8)^n u[n]$

2. Find the inverse Z-transforms of the following signals:

a) $X(z) = \frac{(z-1)(z+0.8)}{(z-0.5)(z+0.2)}$

b) $X(z) = \frac{(z+0.8)}{(z-0.5)(z+0.2)}$

c) $X(z) = \frac{z^3 + z + 1}{(z^2 - 0.5z + 0.25)(z-1)}$

d) $X(z) = \frac{(z^2 - 1)(z+0.8)}{(z-0.5)^2 (z+0.2)}$

3. Use the Final Value Theorem to determine the final value of x[n] for each of the signals defined in Problem 2. Compare your answer obtained from the Final Value Theorem to the answer found by taking $\lim_{n \to \infty} x[n]$

4. Solve the following difference equation using z-transforms:

a) y[n] +3y[n-1] + 2y[n-2] = 2x[n] - x[n-1]; y[-1]= 0; y[-2] = 1, x[n] = u[n]