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