Discrete-Time Convolution:

1. Find the impulse response for each of the following discrete-time systems:

a) $y[n] + 0.2y[n-1] = x[n]-x[n-1]$

b) $y[n] + 1.2y[n-1] = 2x[n-1]$

c) $y[n] = 0.24(x[n]+x[n-1]+x[n-2]+x[n-3])$

d) $y[n] = x[n] + 0.5x[n-1] + x[n-2]$

2. Perform the following convolutions, $x[n]*v[n]$

a) $x[n] = u[n] - u[n-4]$, $v[n] = 0.5^n u[n]$

b) $x[n] = [1\ 4\ 8\ 2]$; $v[n] = [0\ 1\ 2\ 3\ 4]$ (the sequences both start at n=0)

c) $x[n] = u[n]$, $v[n] = 2(0.8)^n u[n]$

d) $x[n] = u[n-1]$, $v[n] = 2(0.5)^n u[n]$