

2. Consider the following sequences:

(i) $x_1[n] = 3\delta[n-2] - 2\delta[n+1]$.

(ii) $x_2[n] = 5\delta[n-3] + 2\delta[n+1]$.

(iii) $h_1[n] = -\delta[n+2] + 4\delta[n] - 2\delta[n-1]$.

(iv) $h_2[n] = 3\delta[n-4] + 1.5\delta[n-2] - \delta[n+1]$.

Determine the following sequences obtained by a linear convolution of a pair of the above sequences:

(a) $y_1[n] = x_1[n] * h_1[n]$.

(b) $y_2[n] = x_2[n] * h_2[n]$.

(c) $y_3[n] = x_1[n] * h_2[n]$.

(d) $y_4[n] = x_2[n] * h_1[n]$.

Do the calculation by hand, but you can use Matlab to confirm your answer.

3. Consider the following sequences:

(i) $x[n] = \{-4, 5, 1, -2, -3, 0, 2\}, -3 \leq n \leq 3$.

(ii) $y[n] = \{6, -3, -1, 0, 8, 7, -2\}, -1 \leq n \leq 5$.

(iii) $w[n] = \{3, 2, 2, -1, 0, -2, 5\}, 2 \leq n \leq 8$.

Determine the following sequences obtained by a linear convolution of a pair of the above sequences:

(a) $u[n] = x[n] * y[n]$.

(b) $v[n] = x[n] * w[n]$.

(c) $g[n] = w[n] * y[n]$.

Do the calculation by hand, but you can use Matlab to confirm your answer.