21 November 2003

1. (2) Use the Z-tranform to solve the difference equation

\[ x_{k+2} - 8x_{k+1} + 15x_k = 1 \]  \hspace{1cm} (1)

with \(x_1 = 0\) and \(x_0 = 0\).

2. (2) Use the Z-tranform to solve the difference equation

\[ x_{k+2} - 8x_{k+1} + 15x_k = 3^k \]  \hspace{1cm} (2)

with \(x_1 = 0\) and \(x_0 = 0\).

3. (2) Use the Z-tranform to solve the difference equation

\[ x_{k+2} - 8x_{k+1} + 15x_k = \delta_k \]  \hspace{1cm} (3)

with \(x_1 = 0\) and \(x_0 = 0\). Remember \(\delta_k\) is the unit pulse with \(\delta_k = (1, 0, 0, 0, \ldots)\).

4. (2) Use the Z-tranform to solve the difference equation

\[ x_{k+2} - 8x_{k+1} + 15x_k = 0 \]  \hspace{1cm} (4)

with \(x_1 = 2\) and \(x_0 = 3\).