Problem 5.1

A particular system computes the average of nine consecutive samples:

\[ y[n] = \frac{1}{9} (x[n-4] + x[n-3] + x[n-2] + x[n-1] + x[n] + x[n+1] + x[n+2] + x[n+3] + x[n+4]) \]

What is the impulse response, \( h[n] \), of this system?

Problem 5.2

The third derivative of a signal, \( d^3x/dt^3 \), may be approximated by the following discrete-time system:

\[ y[n] = -x[n-2] + 3x[n-1] - 3x[n] + x[n+1] \]

What is the impulse response of this system?