FIR Filters and Convolution Example

An FIR filter has impulse response

\[ h[n] = -2\delta[n] + 3\delta[n-1] + \delta[n-2] \]

The input to the filter, \( x[n] \), is

\[ x[n] = \begin{cases} 4 - n, & 0 \leq n \leq 3 \\ 0, & \text{otherwise} \end{cases} \]

- Find the filter output \( y[n] \)

```
>> filter([-2 3 1],1,[1 2 3 4 0 0])
an = -2 -1 1 3 15 4
```
An FIR filter has impulse response

\[ h[n] = \{1, 1, 2, 2\} \]

The input to the filter is

\[ x[n] = \{4, -2, 2\} \]

• Find the filter output \( y[n] \)

MATLAB Check

```
>> filter([1 1 2 2],1,[4 -2 2 0 0 0])
ans = 4     2     8     6     0     4     0
```

\( n = 0 \) \( n = 5 \)