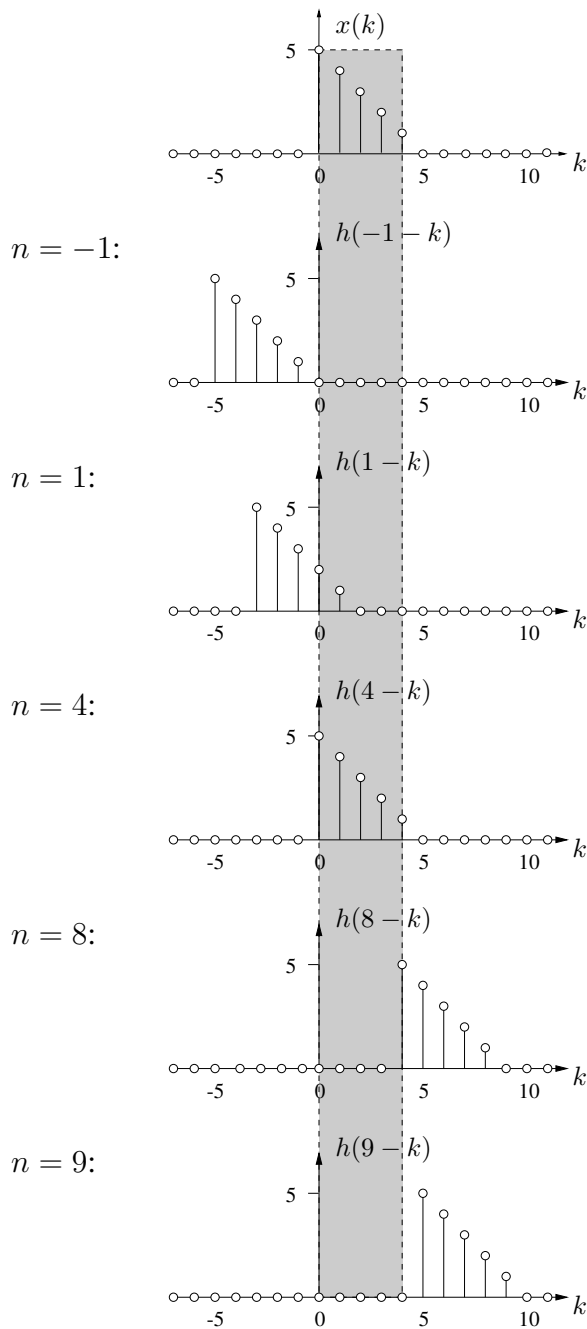


Example: Discrete Linear Convolution



$$y(n) = \sum_{k=-\infty}^{\infty} x(k) \cdot h(n-k)$$

$$\Rightarrow y(n < 0) = 0$$

(no overlap)

$$y(n = 0) = 1 \cdot 5 = 5$$

$$y(n = 1) = 2 \cdot 5 + 1 \cdot 4 = 14$$

$$y(2) = 26$$

$$y(3) = 40$$

$$y(4) = 5 \cdot 5 + 4 \cdot 4 + \dots$$

$$\dots 3 \cdot 3 + 2 \cdot 2 + 1 \cdot 1 = 55$$

$$y(5) = 40$$

$$y(6) = 26$$

$$y(7) = 14$$

$$y(8) = 1 \cdot 5 = 5$$

$$y(9) = 0$$

$$y(n \geq 9) = 0$$

Non-zero elements of $y(n)$:

$$\{5, 4, 3, 2, 1\} * \{1, 2, 3, 4, 5\} = \{5, 14, 26, 40, 55, 40, 26, 14, 5\}$$