

Heaviside I

$$u(x) = \begin{cases} 1 & \text{si } x > 0 \\ 0 & \text{alt.} \end{cases}$$

$$h_2(x) = \begin{cases} x^2 & \text{si } x > 1 \\ x & \text{si } 0 \leq x < 1 \\ -1 & \text{si } x < 0 \end{cases}$$

$$h(x) = x^2 \cdot \underbrace{\begin{cases} 1 & \text{si } x > 1 \\ 0 & \text{alt.} \end{cases}}_{u(x-1)} + x \cdot \underbrace{\begin{cases} 1 & \text{si } 0 \leq x < 1 \\ 0 & \text{alt.} \end{cases}}_{u(x) - u(x-1)} + (-1) \cdot \underbrace{\begin{cases} 1 & \text{si } x < 0 \\ 0 & \text{alt.} \end{cases}}_{1 - u(x)} =$$

$$= x^2 \cdot u(x-1) + x (u(x) - u(x-1)) - 1 (1 - u(x))$$

$$= x^2 \cdot u(x-1) + x \cdot u(x) - x \cdot u(x-1) - 1 + u(x) =$$

$$= (x^2 - x) u(x-1) + (x+1) u(x) - 1 //$$

Heaviside II

$$h(x) = (\sqrt{x} - x)u(x-1) + (x+1)u(x) - 1$$

	$(-\infty, 0)$	$0$	$(0, 1)$	$1$	$(1, +\infty)$
$\sqrt{x} - x$	0	0	0	✓	✓
$x+1$	0	✓	✓	✓	✓
$-1$	✓	✓	✓	✓	✓

$$\begin{aligned} & \underbrace{-1}_{-1} + \underbrace{x+1-1}_{x+1-1} + \underbrace{\sqrt{x}-x+x+1-1}_{\sqrt{x}-x+x+1-1} \end{aligned}$$



$$h(x) = \begin{cases} -1 & \text{si } x < 0 \\ x & \text{si } 0 \leq x < 1 \\ \sqrt{x} & \text{si } x \geq 1 \end{cases}$$