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a)
$$s(t) = (3-t) \left[u(t) - u(t-v) \right]$$

... $h(t) = \frac{ds(t)}{dt}$

= $(3-t) s(t) - u(t) - (3-t) s(t-v) + u(t-v)$

= $3 s(t) - s(t-v) - \left[u(t) - u(t-v) \right]$

= $3 s(t) - s(t-v) - rect(\frac{t-1}{2})$

b) $\pi(t) = u(t) - u(t-v)$

We know that $u(t) \rightarrow (3-t) \left[u(t) - u(t-v) \right]$
 $u(t-v) \rightarrow (5-t) \left[u(t-v) - u(t-v) \right]$

Since the system is linear,

 $\pi(t) \rightarrow (3-t) u(t) + (2t-8) u(t-v) + (5-t) u(t-4)$
 $y(t) \rightarrow y(t) = \begin{cases} 3-t & cct cc \\ t-s & cct cc \\ 0 & otherwise \end{cases}$