

1.17 Determine whether these continuous-time systems are causal or noncausal, have memory or are memoryless. Justify your answers. In the following parts, $x(t)$ is an arbitrary input and $y(t)$ is the output response to $x(t)$:

(a) $y(t) = |x(t)| = \begin{cases} x(t) & \text{when } x(t) \geq 0 \\ -x(t) & \text{when } x(t) < 0 \end{cases}$

(c) $y(t) = (\sin t)x(t)$

a) $y(t) = |x(t)|$ is causal and memoryless
→ only depends on present values of $x(t)$

c) $y(t) = (\sin t)x(t)$ is causal + memoryless
→ only depends on present values.