

## Example 9-20: Flip System not Causal

Consider a system defined by the input/output relation

y(t) = x(-t)

This is a time-reversal system, i.e., it "turns the signal around in time." Equation (9.69) does not apply to this case because the system is only linear, it is *not* time-invariant. Therefore we must resort to the general definition. From the input/output relation, we see that y(-2) = x(2); i.e., we need a "future" value of  $x(\tau)$  to compute y(-2). Indeed, at any time  $t_0 < 0$ , we need a value of the input at a future time  $-t_0$  so the system is not causal.

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