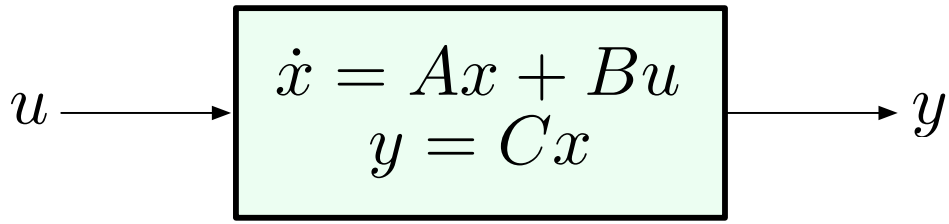
Impulse Response



zero initial condition: $x(0) = 0$

Question: If we know h, how can we find the system's response to other (arbitrary) inputs?

By the sifting property, for a general input $u(t)$ we can write

$$u(t) = \int_{-\infty}^{\infty} u(\tau)\delta(t-\tau)\mathrm{d}\tau.$$

Now we recall the *superposition principle:* the response of a linear system to a sum (or integral) of inputs is the sum (or integral) of the individual responses to these inputs.