$$y(t) = x(\sin(t)) \Rightarrow \text{Causal?, Linear?}$$

$$y[n] = \sum_{k=n-n_0}^{n+n_0} x[k] \quad , \; n_0 \text{ a finite positive integer}$$

Linear?, Time-Invariant?, Stable?

If the upper bound on $x[n]$ is B, what is the upper bound on C?

$$y(t) = t^2 x(t-1) \quad , \; \text{Linear?, Time-Invariant?}$$

$$y[n] = x^2[n-2] \quad , \; \text{Linear?, Time-Invariant?}$$

$$y[n] = x[n+1] - x[n-1] \quad , \; \text{Linear?, Time-Invariant?}$$

$$y(t) = x(t-2) + x(2-t), \; \text{Linear?, Time-Invariant?}$$

Dynamic?, Causal?, Stable?

$$y(t) = x(t)\cos(3t), \quad \text{Linear?, Time-Invariant?}$$

Dynamic?, Causal?, Stable?

$$y(t) = \int_{-\infty}^{2t} x(\tau)\,d\tau, \quad \text{Linear?, Time-Invariant?}$$

Dynamic?, Causal?, Stable?

$$y(t) = \begin{cases} 0, & t < 0 \\ x(t) + x(t-2), & t \geq 0 \end{cases} \quad \text{Linear?, Time-Invariant?}$$

Dynamic?, Causal?, Stable?

$$y(t) = \begin{cases} 0, & x(t) < 0 \\ x(t) + x(t-2), & x(t) \geq 0 \end{cases} \quad \text{Linear?, Time-Invariant?}$$

Dynamic?, Causal?, Stable?

$$y[n] = x[-n]$$ Linear?, Time-Invariant?

Dynamic?, Causal?, Stable?

$$y[n] = x[n-2] - 2x[n-8]$$ Linear?, Time-Invariant?

Dynamic?, Causal?, Stable?

$$y[n] = \begin{cases} x[n] & , n \geq 1 \\ 0 & , n = 0 \\ x[n+1] & , n \leq -1 \end{cases}$$ Linear?, Time-Invariant?

Dynamic?, Causal?, Stable?

$$y[n] = x[4n+1]$$ Linear?, Time-Invariant?

Dynamic?, Causal?, Stable?

$$y(t) = \frac{1}{x(t)} \left(\frac{d\,x(t)}{dt} \right)^2,$$ Homogeneous?, Additive?

$$y[n] = \frac{x[n]x[n-2]}{x[n-1]}, \text{ Homogeneous?, Additive?}$$

$$y(t) = x(t-4), \text{ Invertible?}$$

$$y(t) = \cos(x(t)), \text{ Invertible?}$$

$$y[n] = n\,x[n], \text{ Invertible?}$$

$$y[n] = \begin{cases} x[n-1] & , n \geq 1 \\ 0 & , n = 0 \\ x[n] & , n \leq -1 \end{cases}, \text{ Invertible?}$$

$$y[n] = x[n]x[n-1], \text{ Invertible?}$$

$$y[n] = x[1-n], \text{ Invertible?}$$

$$y[n] = x[1-n], \ \text{Invertible?}$$

$$y[n] = \sum_{m=-\infty}^{n} (1/2)^{n-m} x[m], \ \text{Invertible?}$$

$$y(t) = \int_{-\infty}^{t} e^{-(t-\tau)} x(\tau)\, d\tau, \ \text{Invertible?}$$

$$y(t) = \frac{d\,x(t)}{dt}, \ \text{Invertible?}$$

$$y(t) = x(2t), \ \text{Invertible?}$$

$$y[n] = \begin{cases} x[n/2], & n \text{ even} \\ 0, & n \text{ odd} \end{cases}, \ \text{Invertible?}$$

If $y'(t) - 3y(t) = 4x'(t) + 7x(t)$ find the impulse response $h(t)$.

If $2y''(t) + 5y'(t) = 4x(t)$ find the impulse response $h(t)$.

If $2y[n] - y[n-1] = 3x[n-1] + x[n-2]$ find the impulse response $h[n]$.

If $x(t) = \delta(t-1) - 3\delta(t+2)$ and $h(t) = 4\,\mathrm{rect}(t/5)$
and $y(t) = x(t) * h(t)$ find the signal energy of $y(t)$ E_y.

If $x(t) = \cos(200\pi t)u(t)$ and $h(t) = e^{-100t}u(t)$
and $y(t) = x(t) * h(t)$ find $y(t)$.

If $x(t) = e^{-20t}\cos(200\pi t)u(t)$ and $h(t) = e^{-100t}u(t)$
and $y(t) = x(t) * h(t)$ find $y(t)$.

If $x[n] = \mathrm{ramp}[n]u[3-n]$ and $h[n] = u[n+1] - u[n-2]$
and $y[n] = x[n] * h[n]$ find the signal energy of $y[n]$.

If $x[n] = u[n+4]$ and $h[n] = -u[n-1]$ and $y[n] = x[n]*h[n]$, find $y[n]$.

If $x[n] = u[n-2] - u[n-6]$ and $h[n] = u[n+3] - u[n-3]$ and $y[n] = x[n]*h[n]$, find $y[n]$.

If $x[n] = (0.9)^n u[n]$ and $h[n] = u[n-4]$ and $y[n] = x[n]*h[n]$ find $y[n]$.