6.3000: Signal Processing

Systems

October 8, 2024

Linearity and Time Invariance

Determine which of the following systems are **linear**.

Determine which of the following systems are **time-invariant**.

1. $y[n] = x[-n]$
2. $y[n] = x[2n]$
3. $y[n] = \left|x[n]\right|$

Linearity and Time Invariance

Determine which of the following systems are **linear**.

Determine which of the following systems are **time-invariant**.

4. $y(t) = \dfrac{d}{dt}x(t)$

5. $y(t) = \displaystyle\int_0^t x(\tau)d\tau$

6. $y(t) = \displaystyle\int_{-\infty}^t x(\tau)d\tau$

7. $y(t) = \displaystyle\int_t^{\infty} x(\tau)d\tau$

8. $y(t) = \displaystyle\int_{-\infty}^{\infty} x(\tau)d\tau$