

6.3000: Signal Processing

Systems

October 08, 2026

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. $y[n] = |x[n]|$

Linearity and Time Invariance

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

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

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

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

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

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

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