

$$y[n] - 0.5y[n-1] = x[n]$$

$$Y(z) - 0.5z^{-1}Y(z) = X(z)$$

$$H(z) = \frac{Y(z)}{X(z)} = \frac{1}{1 - 0.5z^{-1}}$$

Evaluate $H(z)$ at $z = e^{j\omega}$

$$H(e^{j\omega}) = \frac{1}{1 - 0.5e^{-j\omega}} \quad \swarrow \text{inverse Fourier}$$

$$h[n] = \frac{1}{2\pi} \int H e^{j\omega} e^{j\omega n} d\omega = \frac{1}{2\pi} \int \frac{1}{1 - 0.5e^{-j\omega}} e^{j\omega n} d\omega$$

$$h[n] = \frac{1}{2\pi} \int A e^{j\omega n} d\omega$$

$$h[n] = \frac{1}{2\pi} A \cdot 2\pi \delta[n]$$

$$h[n] = \frac{1}{1 - 0.5e^{-j\omega}} \delta[n]$$

$$\frac{A}{1 - 0.5e^{-j\omega}} = \frac{1}{1 - 0.5e^{-j\omega}}$$

$$1 = A(1 - 0.5e^{-j\omega})$$

$$A = \frac{1}{1 - 0.5e^{-j\omega}}$$

Sena ERSM
04020234
Ema