

$$y[n] = x[n] - 0.9x[n-1]$$

DTFT

$$Y(\omega) = X(\omega) - 0.9 e^{-j\omega} X(\omega) \leftarrow$$

Z-TRANSFORM

$$\begin{aligned} Y(z) &= X(z) - 0.9z^{-1} X(z) \\ &= (1 - 0.9z^{-1}) X(z) \end{aligned}$$

$$H(z) = \frac{Y(z)}{X(z)} = 1 - 0.9z^{-1}$$

FREQ. RESPONSE:  $z = e^{j\omega}$

$$H(\omega) = 1 - 0.9 e^{-j\omega}$$

$$|H(\omega)| = ?$$

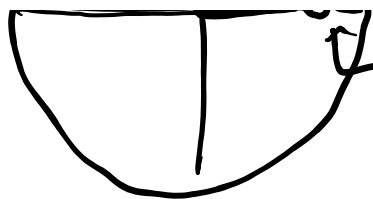
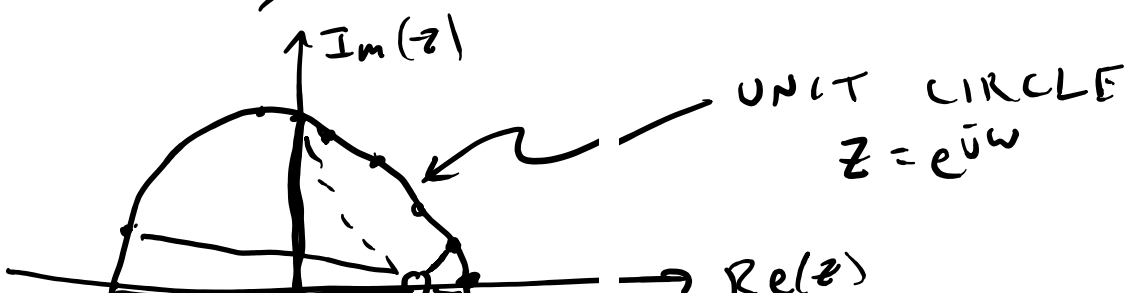
TRANSFER FUNCTION

$$H(z) = 1 - 0.9z^{-1}$$

$$= \frac{1}{z} (z - 0.9)$$

$$H(\omega) = \frac{1}{e^{j\omega}} (e^{j\omega} - 0.9)$$

$$|H(\omega)| = \frac{1}{|e^{j\omega}|} |e^{j\omega} - 0.9| = |e^{j\omega} - 0.9|$$



$$\begin{aligned} \text{---} &= |H(\frac{\pi}{2})| = \sqrt{1^2 + (0.9)^2} \\ &= \sqrt{1.81} \end{aligned}$$

