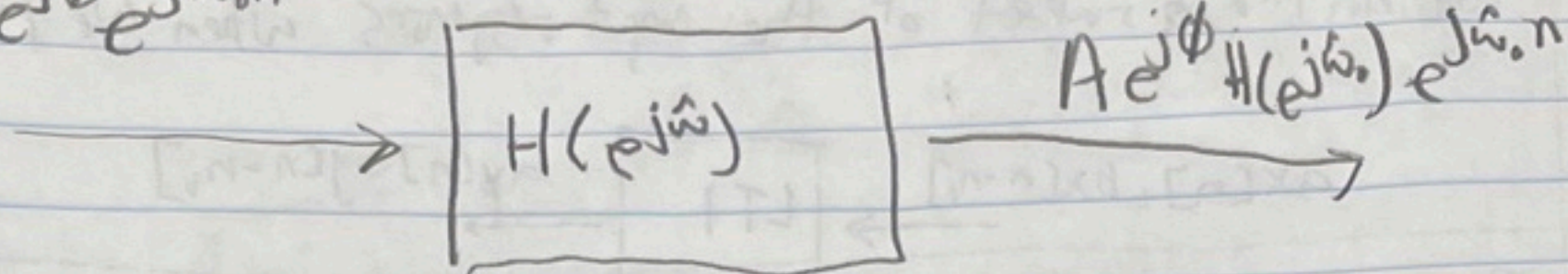


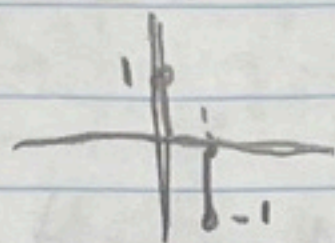
Frequency Response for LTI

$$Ae^{j\phi} e^{j\omega n}$$



$$H(e^{j\omega}) = \sum_{n=-\infty}^{\infty} h[n] e^{-j\omega n}$$

c. $h[n] \rightarrow$



$$h[0]e^{-j\omega(0)} + h[1]e^{-j\omega(1)}$$

$$1 - e^{-j\omega}$$

Q3 a. $h[n] = -3\delta[n+1] + 2\delta[n-2]$

b. $H(e^{j\omega}) = -3e^{j\omega} + 2e^{-2j\omega}$

c. find $y[n]$ when $x[n] = e^{j(\pi/8)n}$
 $y[n] = -3e^{j(\pi/8)n} + 2e^{-2j(\pi/8)n}$

d) $2e^{j\pi/4} + e^{j\pi/4} e^{j\pi/4 n} \rightarrow H(e^{j\omega}) \rightarrow 2H(\pi/8)e^{j\pi/4 n} + e^{j\pi/4} H(\pi/4)e^{j\pi/4 n}$

Find out $H(\omega)$ and simplify

Q4

$$|H(e^{j\omega})| = |1 - e^{-j\omega}| = |-1(\cos(\omega) + j\sin(\omega))|$$

$$= |(1 - \cos(\omega)) - j\sin(\omega)| = \sqrt{(1 - \cos(\omega))^2 + \sin^2(\omega)} = \sqrt{2(1 - \cos(\omega))}$$

6-2

a) $x[n] = e^{j(0.1)\pi n} + e^{j(0.4)\pi n}$

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

$$y[n] = e^{j(0.1)\pi n} + e^{j(0.4)\pi n} + e^{j(0.1)\pi(n-1)} + e^{j(0.4)\pi(n-1)}$$

$$y[n] = \underbrace{(1 + e^{-j0.1\pi})}_{A_1 e^{j\phi_1}} e^{j0.1\pi n} + \underbrace{(1 + e^{-j0.4\pi})}_{A_2 e^{j\phi_2}} e^{j0.4\pi n}$$