

CPE381 #22

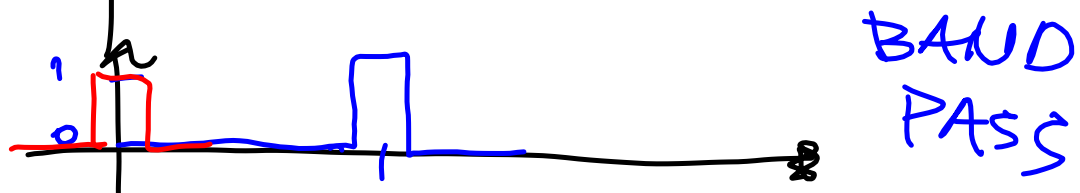
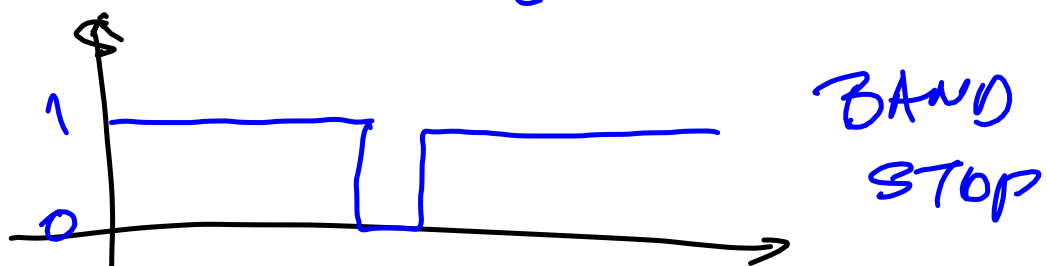
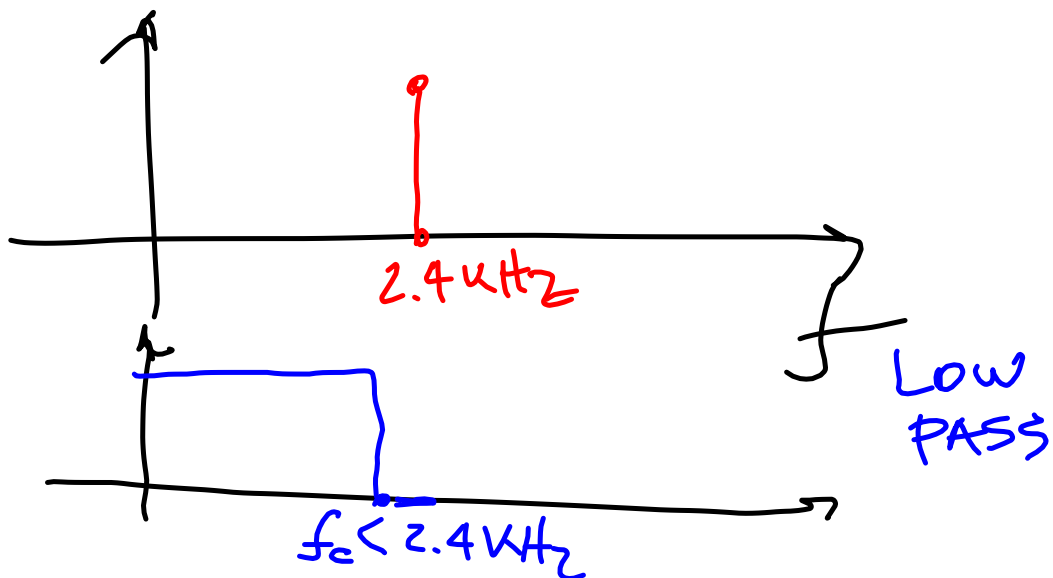
Project 85.3= READ **ALL** REQUIREMENTS

= check before processing

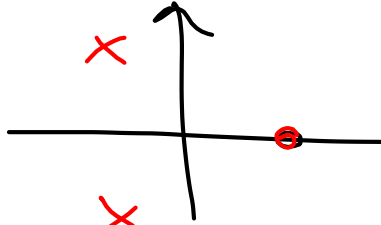
mono
stereo

stereo / 16 bit samples

= execution time



splane (num, den)



~~freqresp_s(b, a, wmax)~~

$$[s^2 + s + 1] \rightarrow [1 \ 1 \ 1]$$

$$H = \frac{1}{s^2 + s + 1} \rightarrow \text{den}$$

#1
hw 4

$z_1 = 1 \quad z_{2,3} = 1 \pm j\pi$

TEXTBOOK 5.7.3.

$$H(s) = \frac{\prod_i (s - z_i)}{\prod_k (s - p_k)}$$

$$= \frac{(s - 1)(s - (1 + j\pi))(s - (1 - j\pi))}{\dots}$$

$$= \frac{(s - 1)(\underbrace{s - 1}_{\text{red circle}} - j\pi)(\underbrace{s - 1}_{\text{red circle}} + j\pi)}{\dots}$$

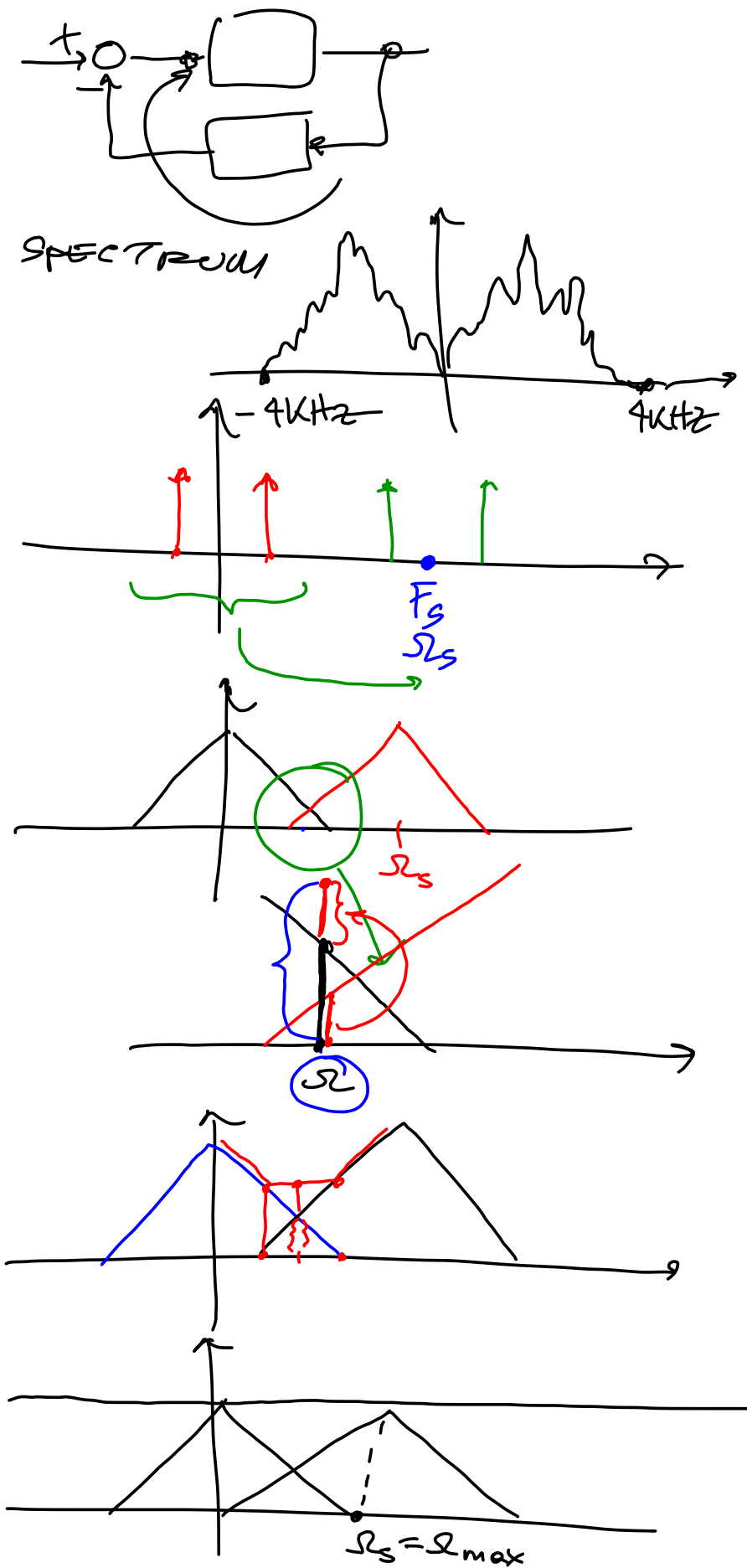
$$= \frac{(s - 1)((s - 1)^2 - (j\pi)^2)}{\dots}$$

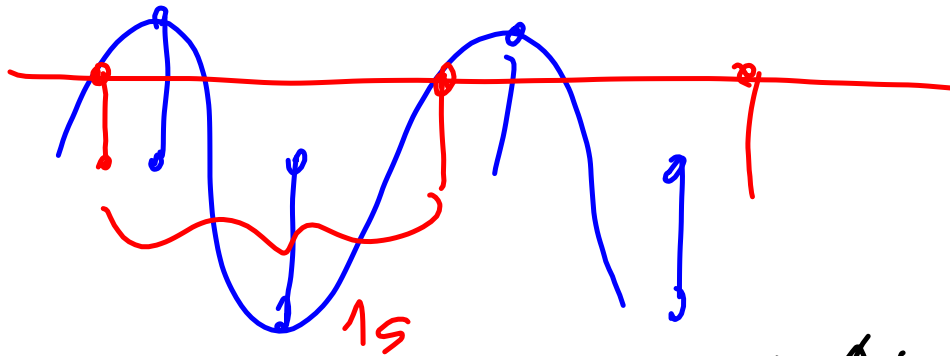
(a-b)(a+b) = a² - b²

$$= \frac{(s - 1)((s - 1)^2 + \pi^2)}{\dots}$$

$$= \frac{s^3 - 3s^2 + (3 + \pi^2)s - (1 + \pi^2)}{\dots}$$

$$\Rightarrow \text{num} = \left[\underbrace{1}_{s^3} - \underbrace{3}_{s^2} \underbrace{(3 + \pi^2)}_s - \underbrace{(1 + \pi^2)}_{s^0} \right]$$





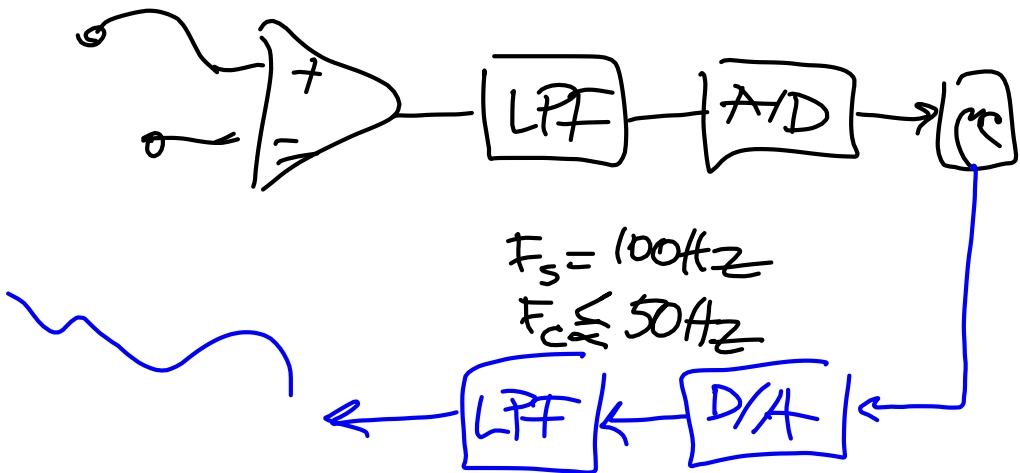
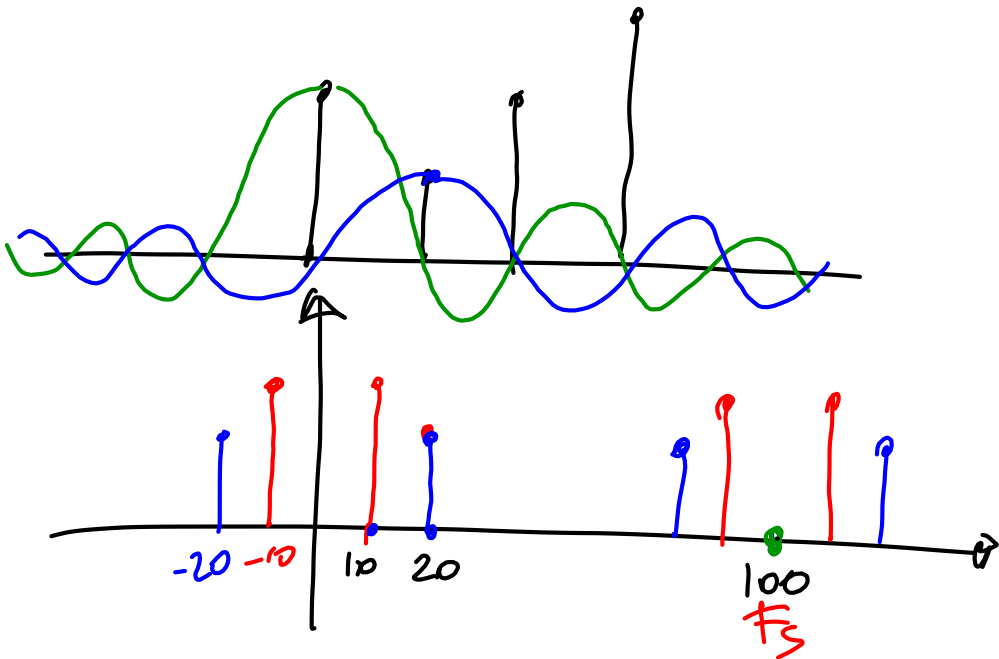
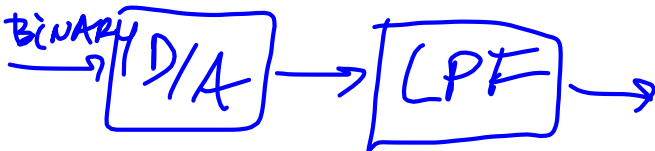
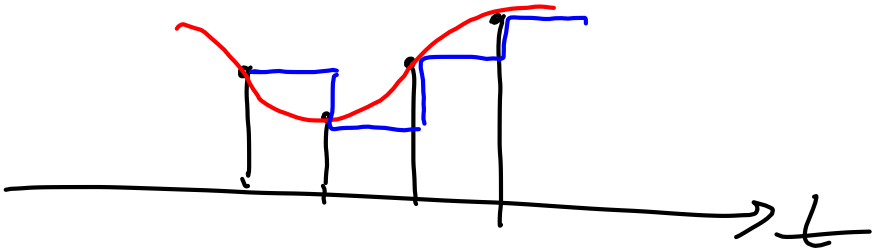
$$f_s > 2 \cdot f_{\max}$$

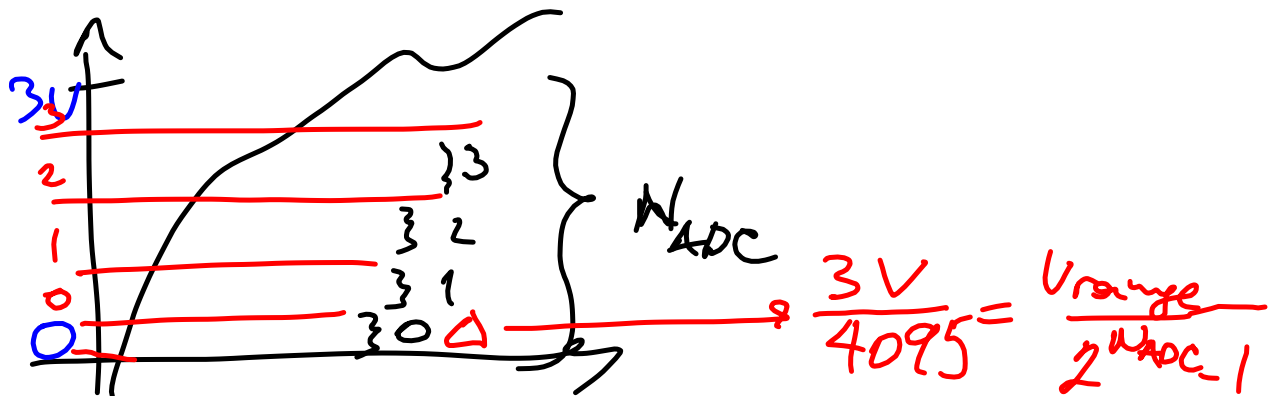
Nyquist

$$f_{\max}^{\text{voice}} = 4 \text{ kHz}$$

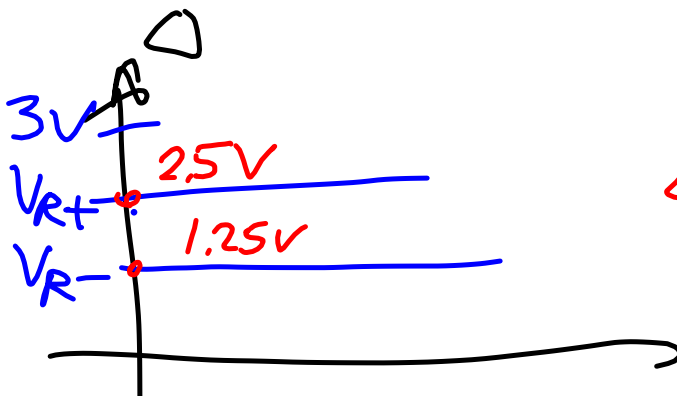
$$\underline{f_s} > 2 \cdot 4 \text{ kHz} = \underline{8 \text{ kHz}} \quad \underline{8 \text{ bit/sample}}$$

$$8 \text{ kHz} \cdot 8 \text{ bit/s} \Rightarrow \underline{\underline{64 \text{ kb/s}}}$$





$$12 \text{ bits} \rightarrow 2^{12} = 4096$$



$$\Delta = \frac{V_{R+} - V_{R-}}{2^{N_{ADC}} - 1}$$

