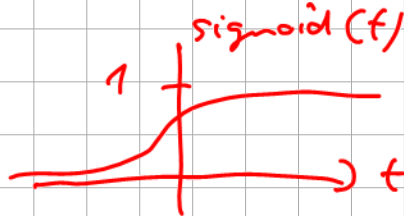


input target output → training
 validation
 what is the testing
 range

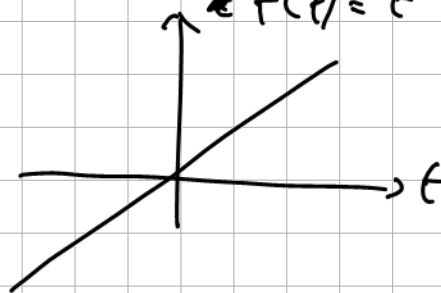
0... 1
 0... ∞
 $-\infty$... ∞

e.g. sigmoid
 e.g. ReLU
 e.g. Leaky ReLU
 ReLU (f)

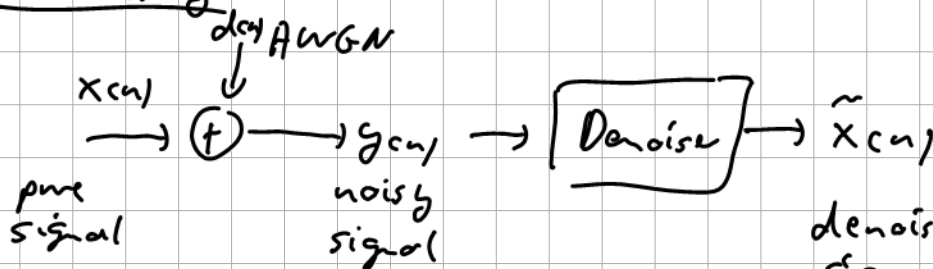


$-\infty$... ∞

e.g. Linear layer
 $f(t) = t$



Denoising



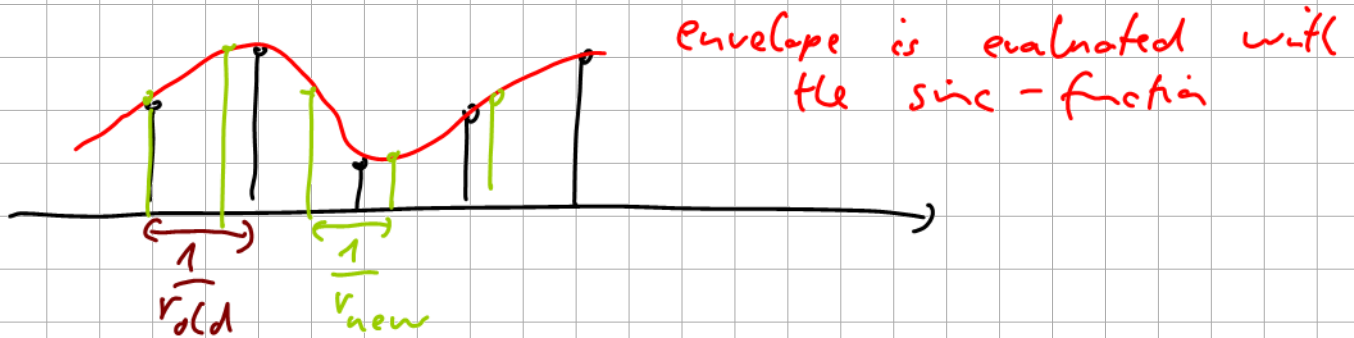
$$SNR = 10 \log_{10} \frac{\sum x_{cn}^2}{\sum (x_{cn} - \tilde{x}_{cn})^2}$$

$$= 7 \text{ dB}$$

$$SNR = 10 \log_{10} \frac{\sum x_{cn}^2}{\sum (x_{cn} - y_{cn})^2}$$

$$= -20 \text{ dB}$$

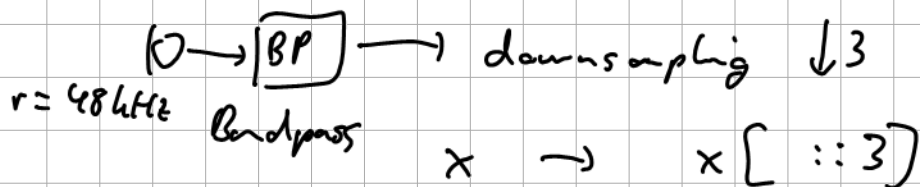
C2 25 T2 Upsampling



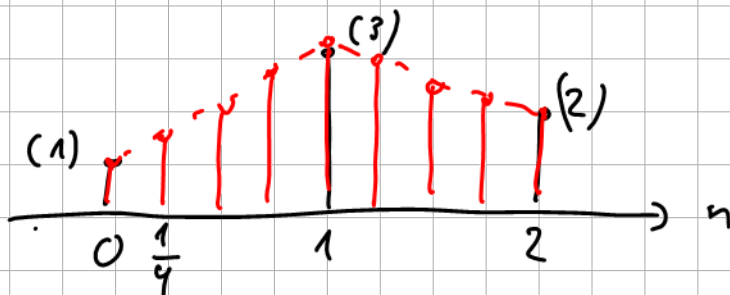
with the envelope it is possible to use arbitrary new sampling rates r_{new} .



100 kHz ... 7000 kHz



assume : $r_{\text{new}} = 4 \cdot r_{\text{old}}$ linear interpolation



$$x\left(\frac{1}{4}\right) = ?$$

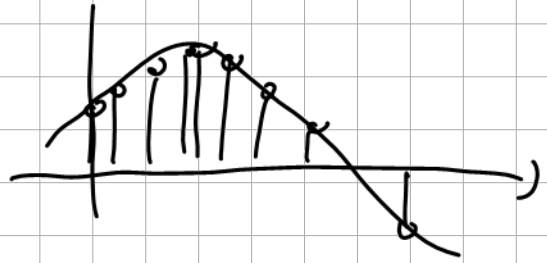
$$m = \frac{3-1}{1-0} = 2$$

$$x\left(\frac{1}{4}\right) = 2 \cdot \frac{1}{4} + 1 =$$

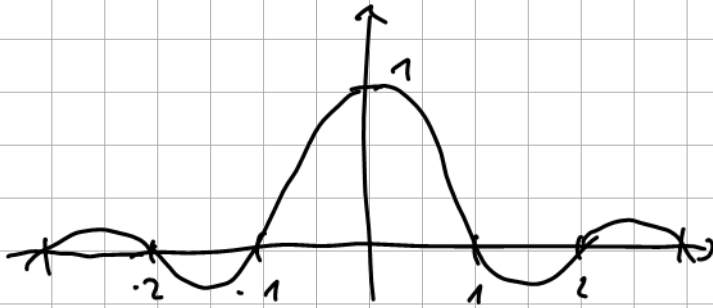
$$1 = m \cdot 0 + n \Leftrightarrow n = 1$$

$$r_{\text{new}} = 2.8 \cdot r_{\text{old}}$$

upsample S_y 28
downsample S_y 10



Sketch the function $\text{sinc}(x)$ in the range $-2 \dots 2$



precision
sufficient for exam













