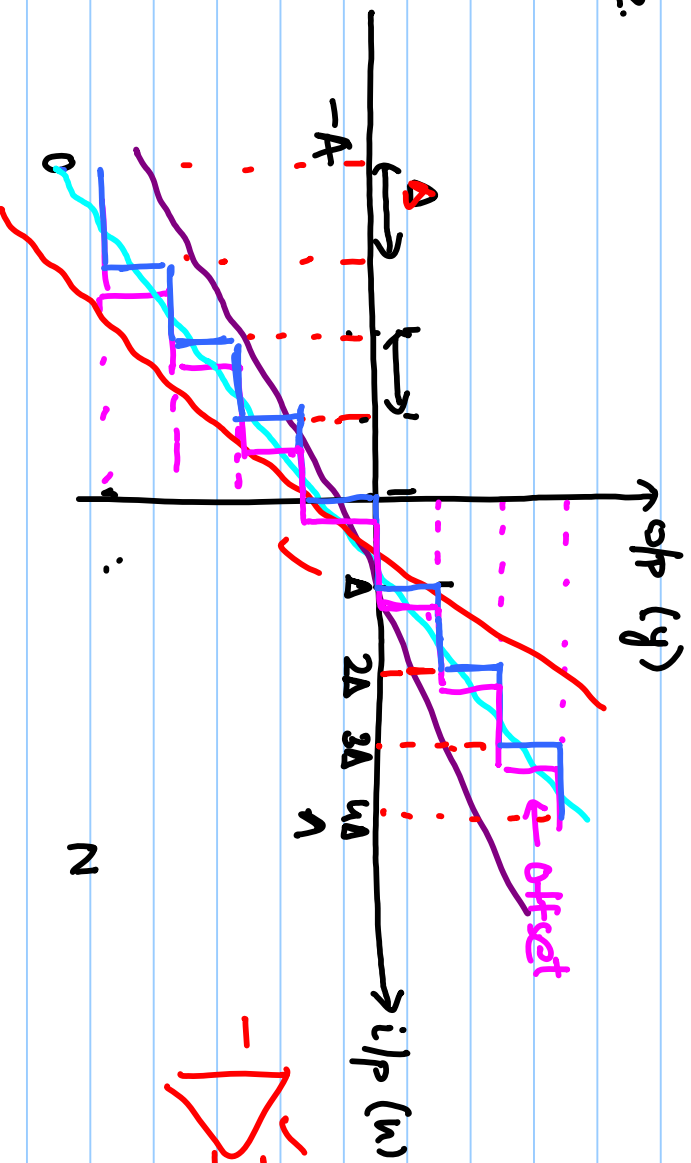


1. SNR: Signal to quantization noise ratio

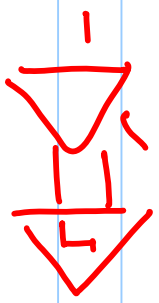
2.



$$y = u + q \quad \checkmark$$

$$y = (u - V_{off}) + q$$

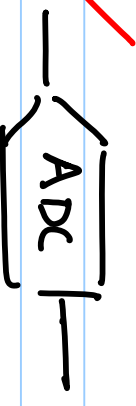
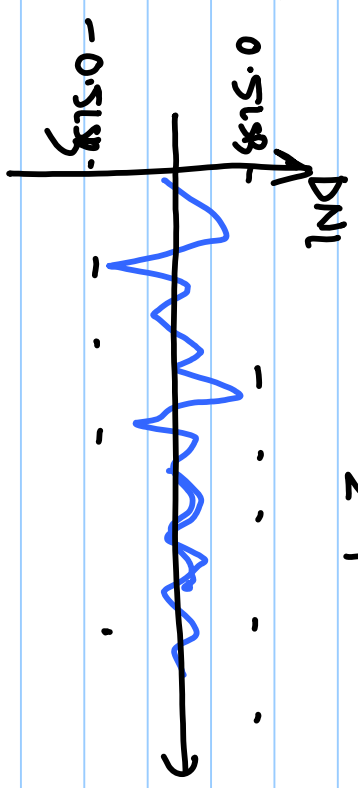
$$y = (k u + q) \quad \checkmark$$



3. Dynamic Non-linearity (DNL)

$$DNL_k = \frac{\text{width } \tau_k (V_F) - 1 \text{LSB}}{1 \text{LSB}}$$

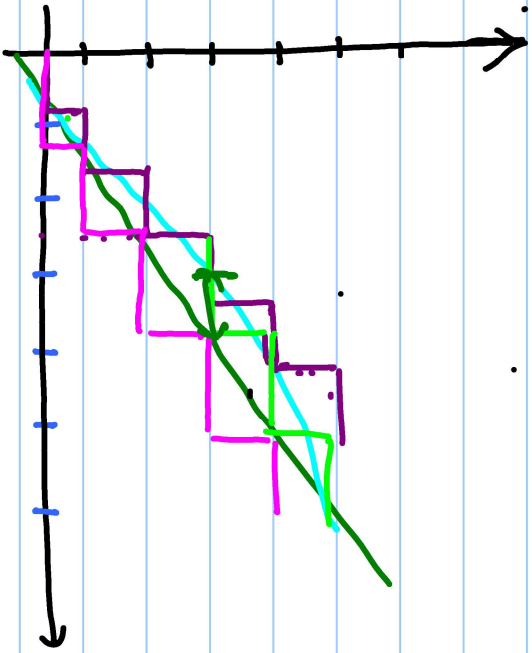
$$\Delta = \frac{2A}{2^N - 1} \quad (V)$$



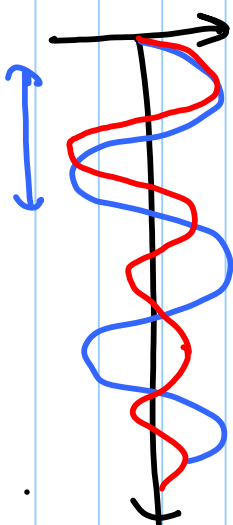
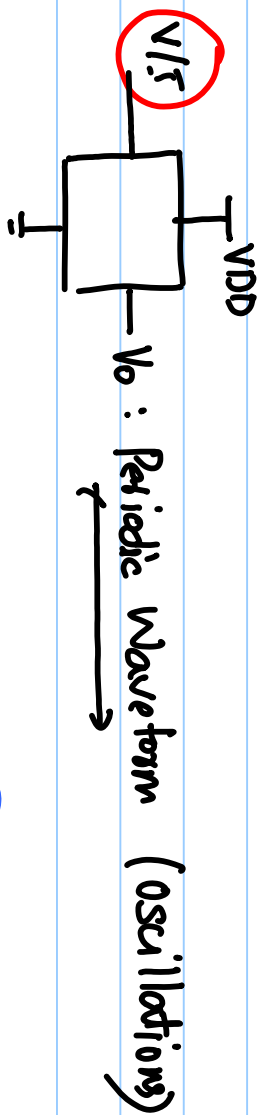
3. Integral Non Linearity (INL)



$$INL_k = \frac{\sum_{i=1}^R w_i - (k \cdot \underline{LSB})}{\underline{LSB}}$$



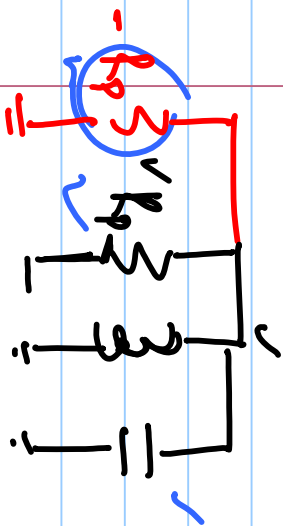
Oscillators



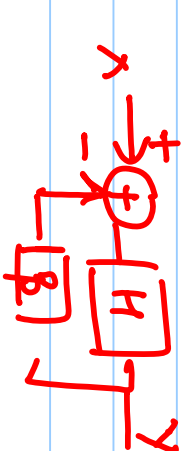
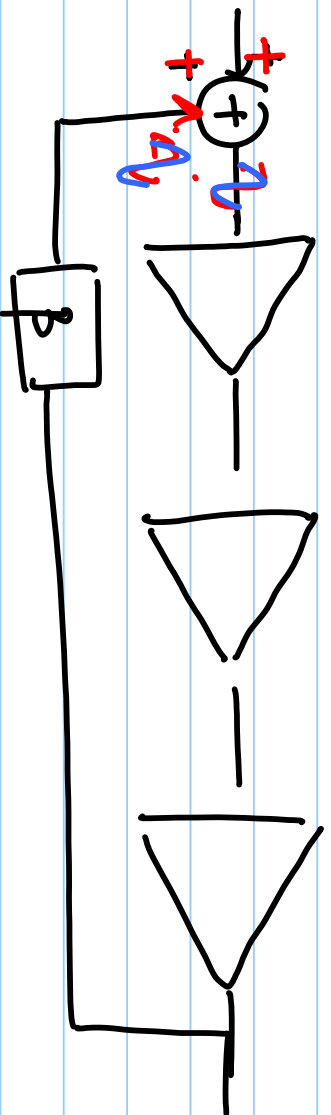
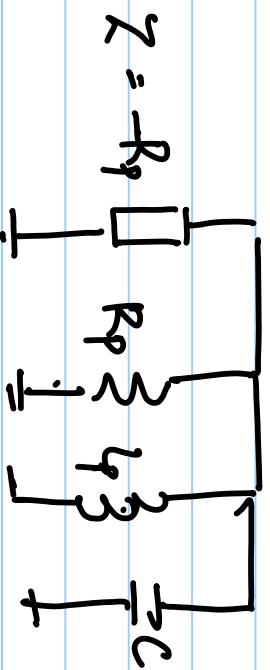
$$\omega_0 = \frac{1}{\sqrt{LC}} \quad (\text{rad/s})$$

$$f = \frac{1}{2\pi\sqrt{LC}} \quad \text{Hz}$$

$$T = \frac{1}{f}$$



$$Z_{in}(j\omega) = R_p + j\omega L_p = \frac{R_p \times j\omega L_p}{R_p + j\omega L_p}$$



$$\frac{Y}{X} = \frac{1}{1+s/w_p}$$

$$\frac{A_0}{1+s/w_p}$$

$$L_A = \frac{A_0^3}{(1+s/w_p)^3} \cdot \beta \quad (\beta=1)$$

Barkhausen Criteria

$$|L_A| = 1$$

$$\angle L_A = 2\pi n$$

$$\angle L_A = -3 \tan^{-1} \left(\frac{\omega}{\omega_p} \right)$$

$$|L_A(j\omega_0)| = 1$$

