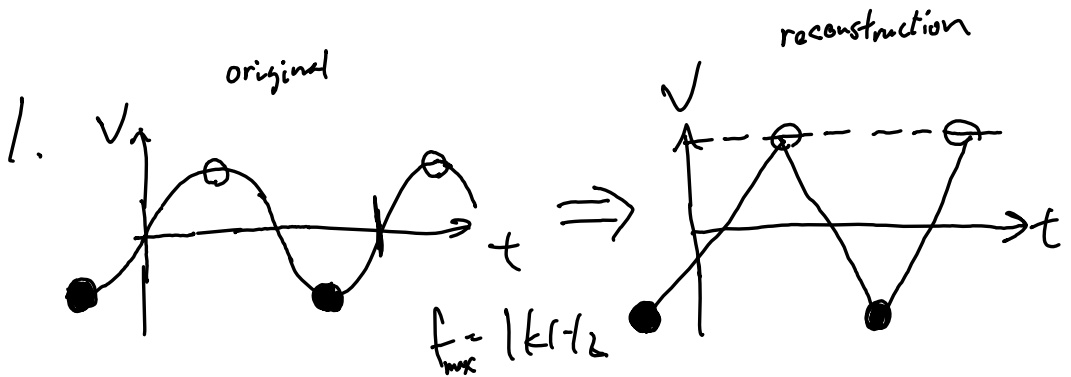


# ch. 19 D/A, A/D converters



$$\textcircled{a} f_{\text{sampling}} = 1 \text{ kHz} / 0 + \textcircled{a} f_{\text{Nyq}} = 2 \text{ kHz}$$

$$f_{\text{Nyq}} \geq 2 \cdot f_{\max}$$

$$2 \text{ kHz}$$

3. 
$$\text{LSB} = \frac{\Delta V}{2^{\text{bits}}}$$

$$8 \text{ bit: } \frac{5 \text{ V}}{2^8} = \boxed{19.5 \text{ mV}}$$

$$10 \text{ bit: } \frac{5 \text{ V}}{2^{10}} = \boxed{4.88 \text{ mV}}$$

$$16 \text{ bit: } \frac{5 \text{ V}}{2^{16}} = \boxed{76.3 \text{ } \mu\text{V}}$$

$$24 \text{ bit: } \frac{5 \text{ V}}{2^{24}} = \boxed{298 \text{ nV}}$$