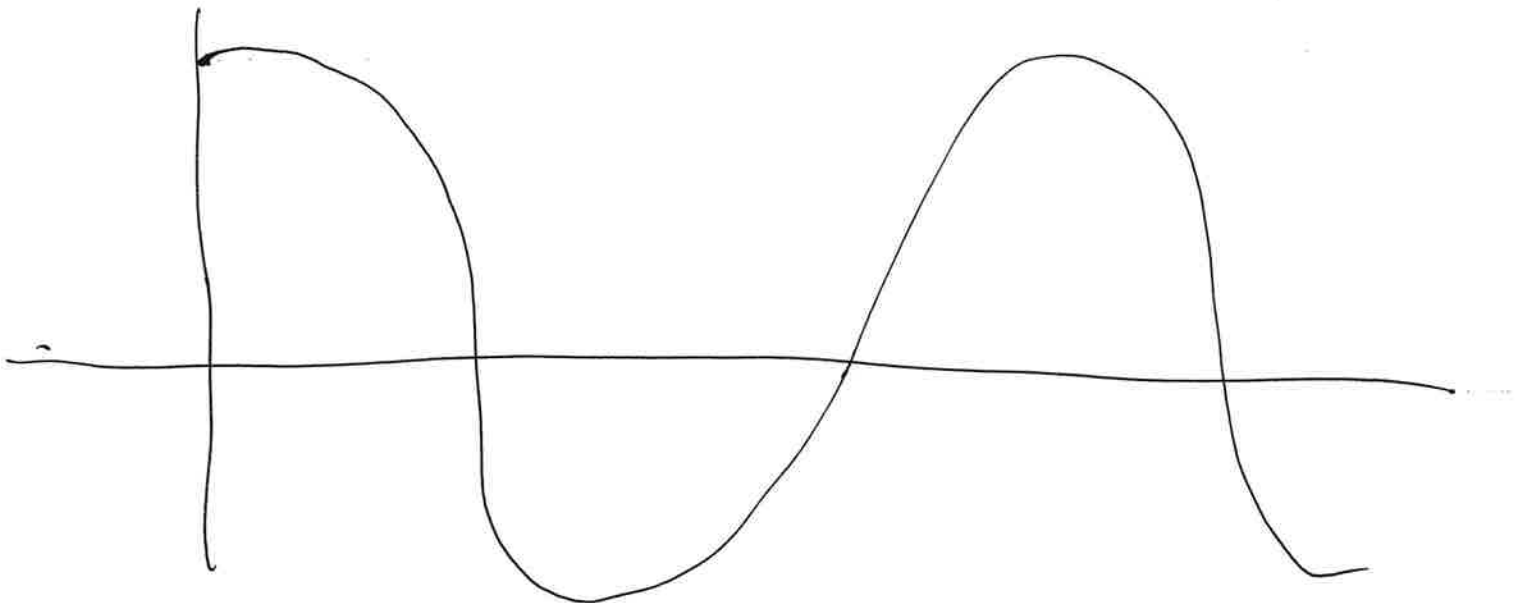
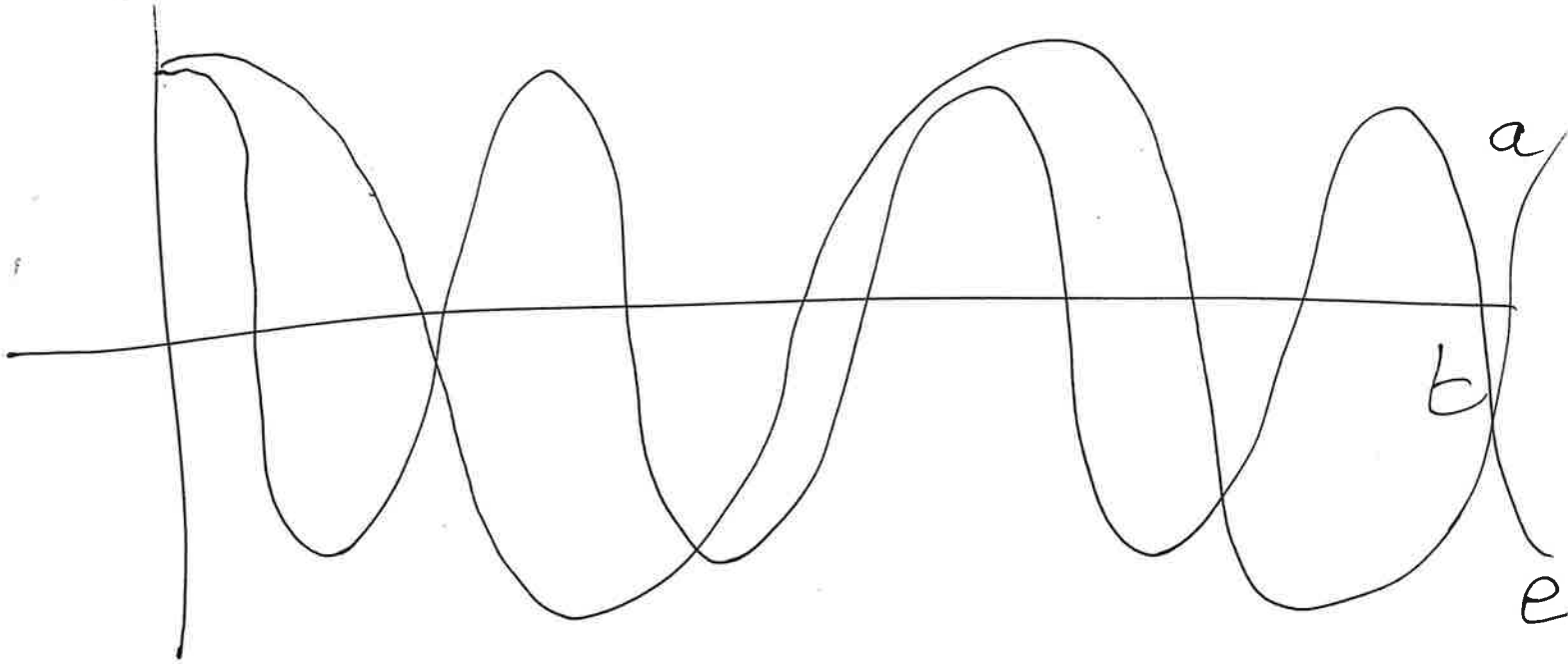


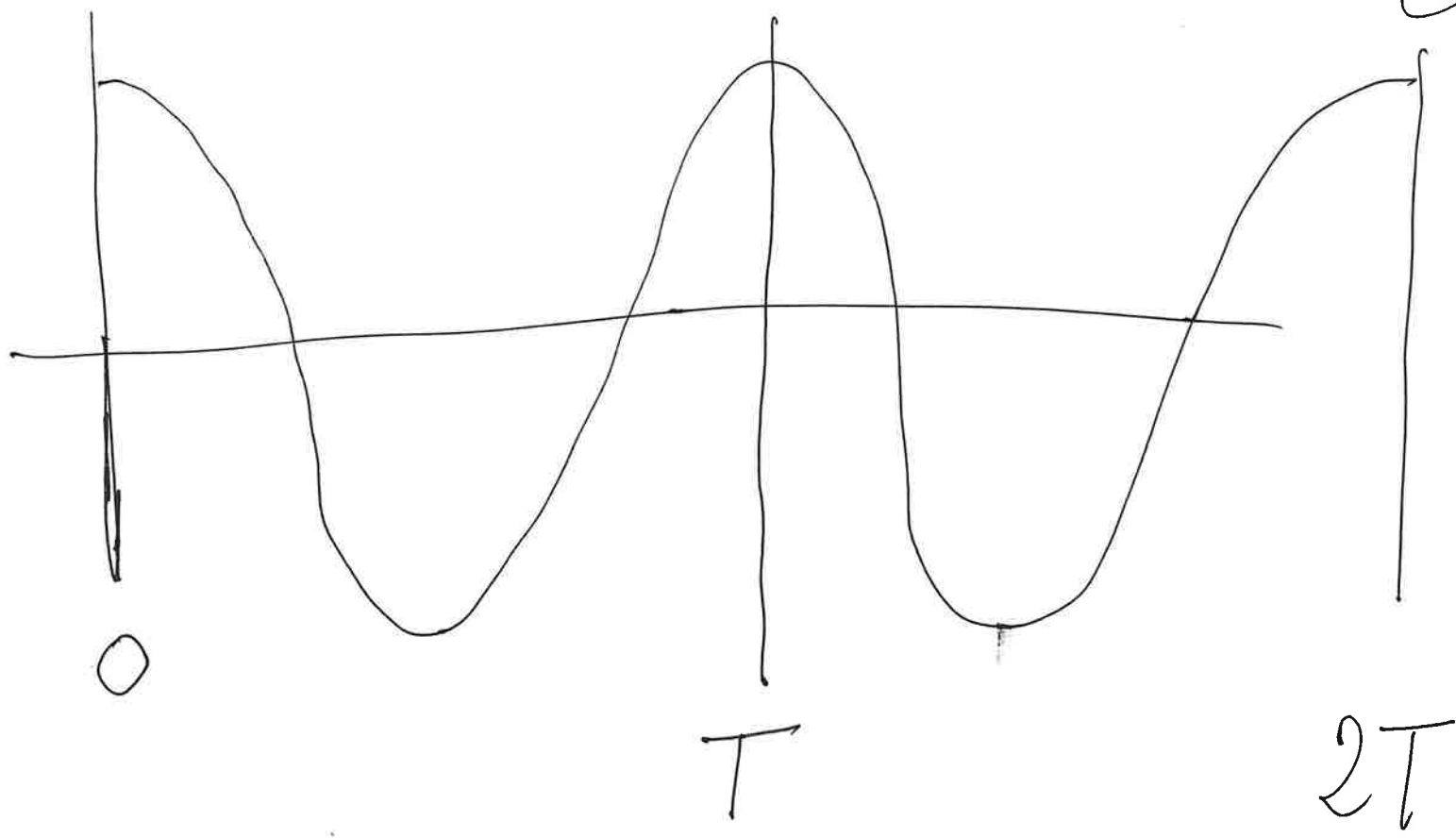
V Sound

A sound is a time signal.

A fundamental sound is a repetitive time signal : periodic time signal



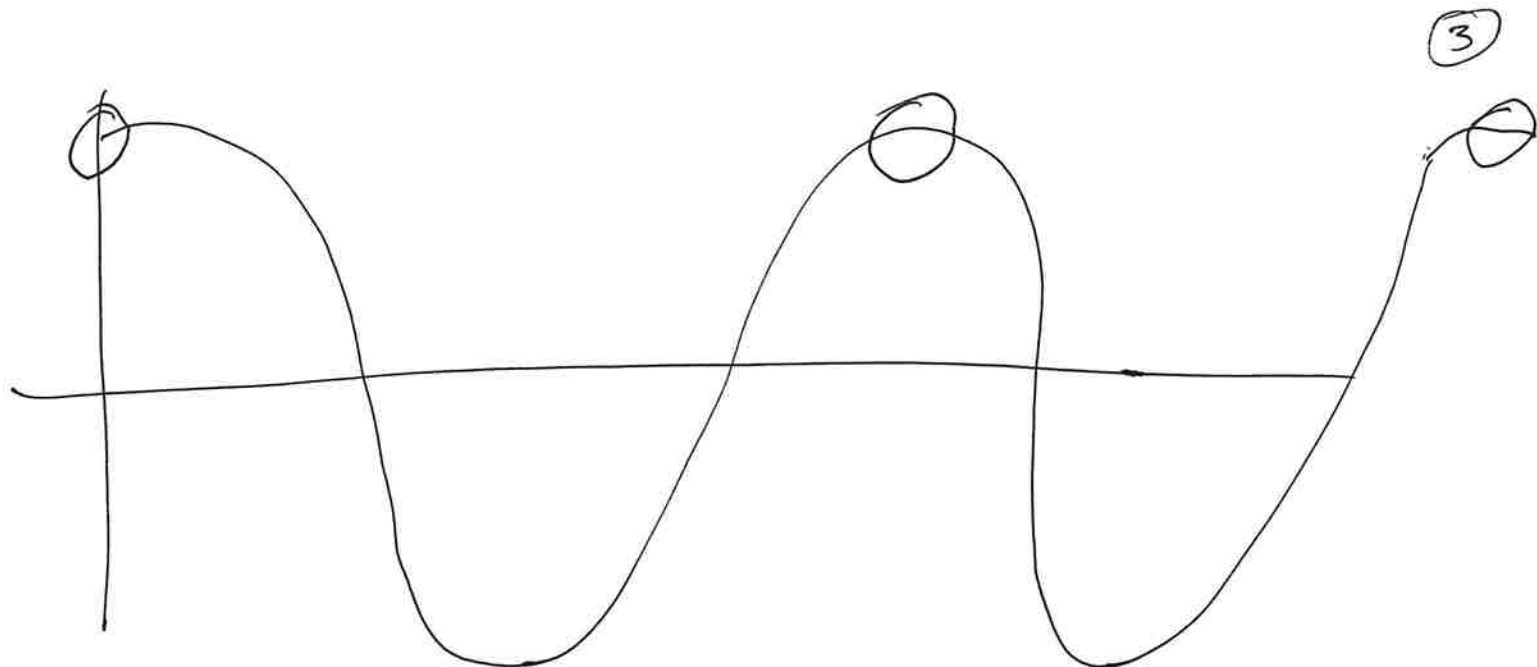
2



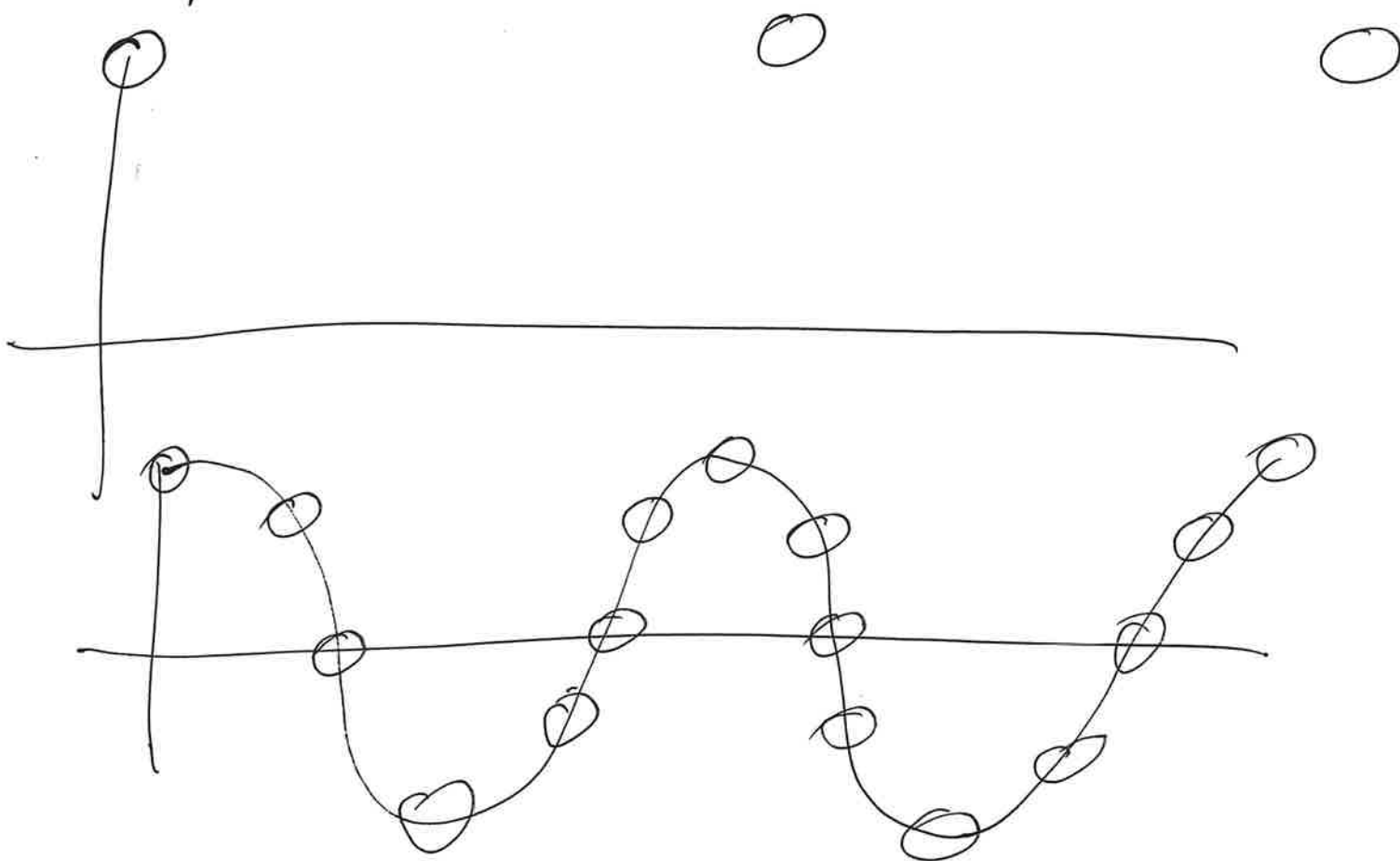
T (second) period of the signal.

$$f = \frac{1}{T} = \frac{1}{s} = \text{Hz frequency of the signal.}$$

1 Herz : # of period over 1 second.



Sample



Nyquist theorem the sampling frequency f_s needs to be strictly greater than $2 \times f_{\text{signal}}$.

Sound of music:

(4)

ear : up to 20,000 Hz

Sampling rate f_s of a sound:

$$f_s \geq 2 \times 20,000$$

Music industry : $f_s = 44,100$ Hz

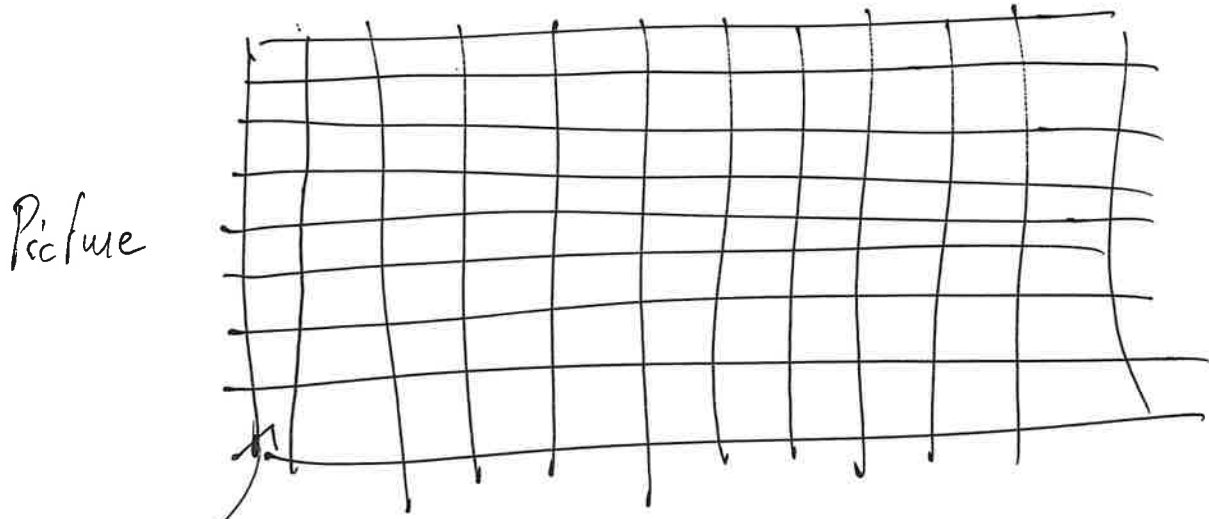
Each point is a number.

That number is stored on 16 bits

How much space do you need
to record a 5 min song on
a computer?

$$\begin{aligned} S &= 5 \left[\frac{\text{min}}{\text{min}} \right] \times 60 \left[\frac{\text{s}}{\text{min}} \right] \times 44,100 \left[\frac{\text{points}}{\text{s}} \right] \times 16 \left[\frac{\text{bits}}{\text{point}} \right] \\ &= 5 \times 60 \times 44,100 \times 16 \end{aligned}$$

VI Images :



pixel
color :

A color is a mixture of 3
fundamental colors, Red, Green, Blue.

