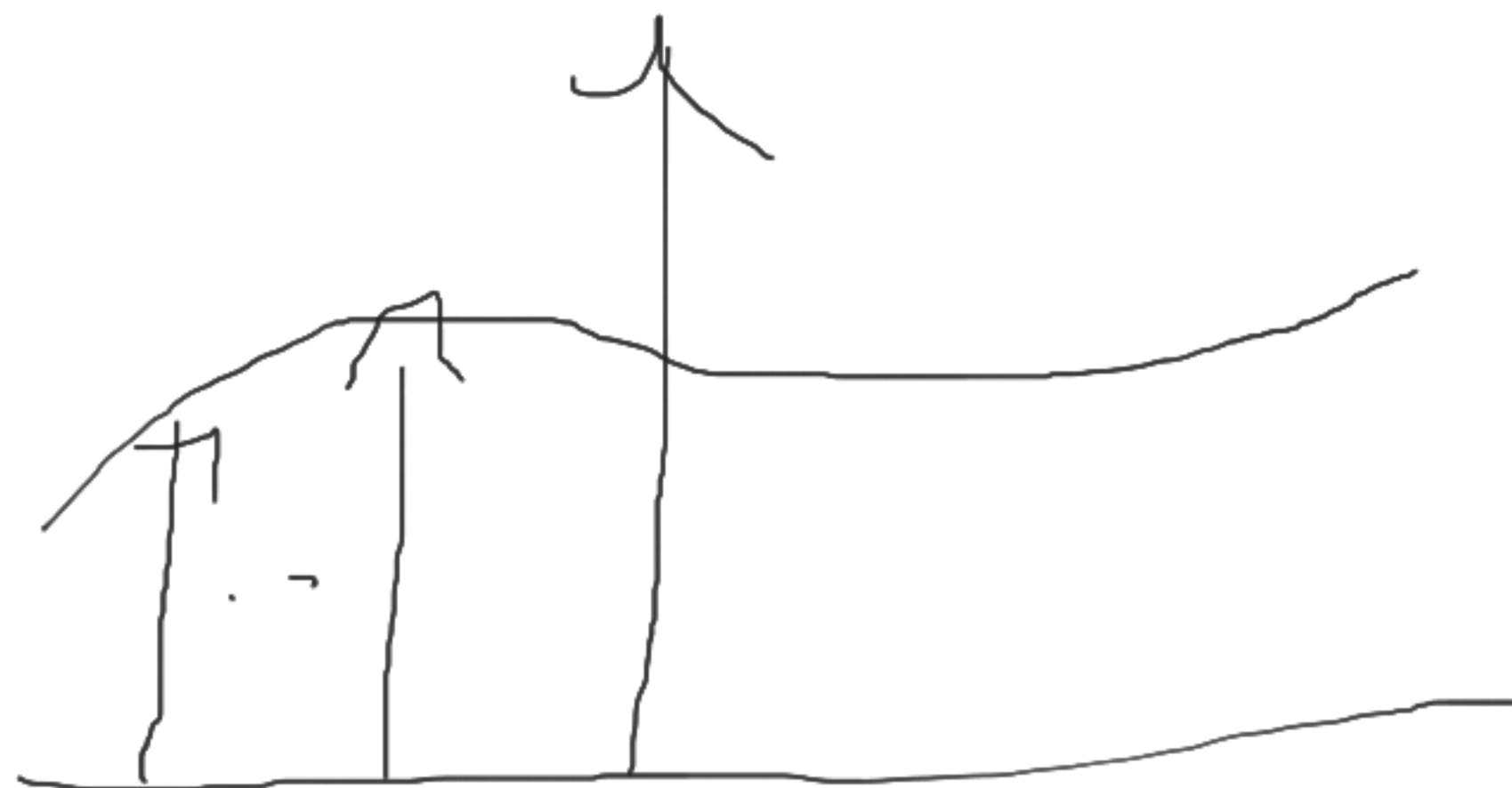


$$\begin{bmatrix} \vdots \\ \sqrt{0} \\ \vdots \end{bmatrix}$$

$$\mathbb{Z}$$

$$\{e_i\}$$

$$f: \mathbb{R} \rightarrow \mathbb{R}$$



$$\int xy \, dt$$

$$\sum_i^T e_i$$

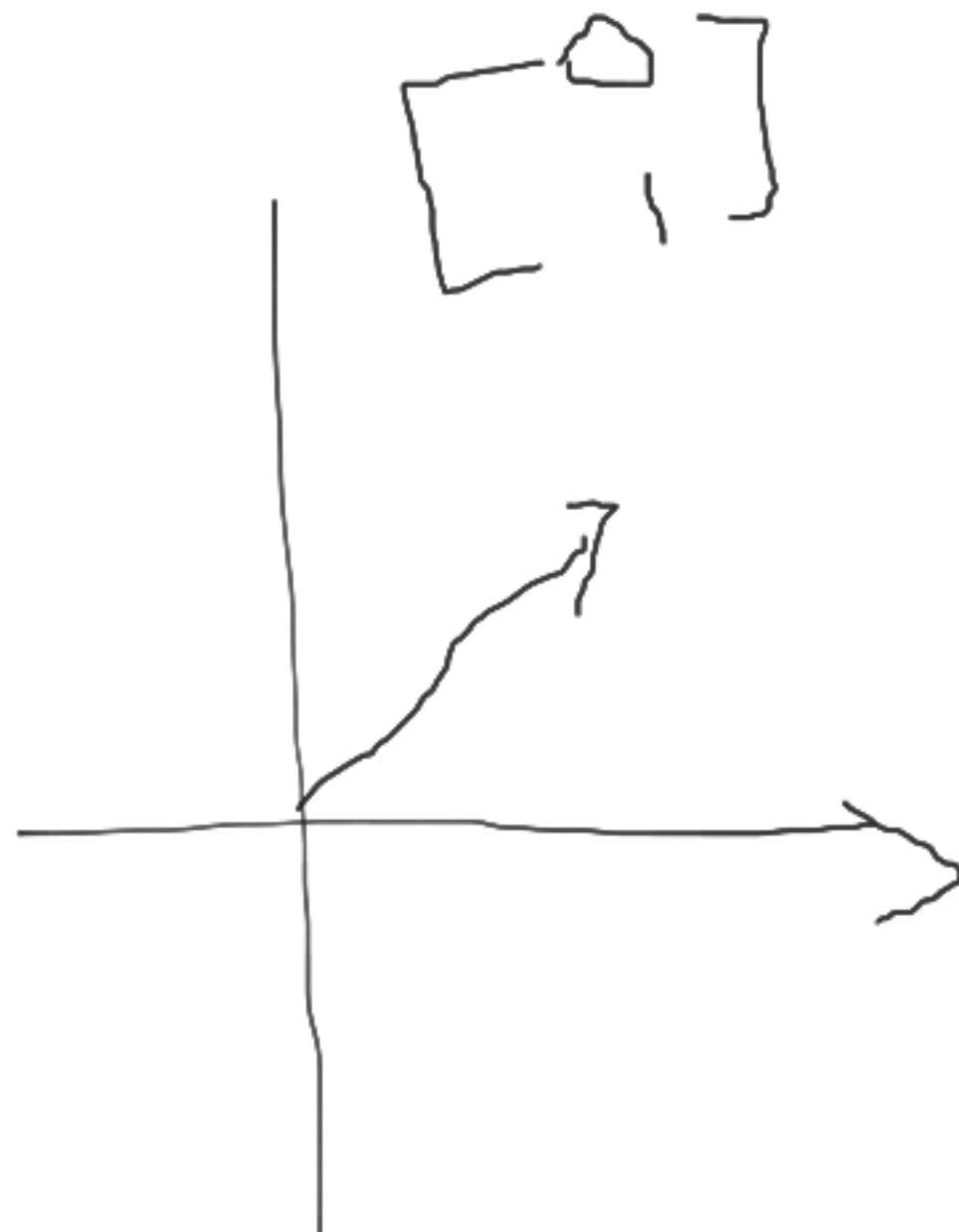




Ch. of basis

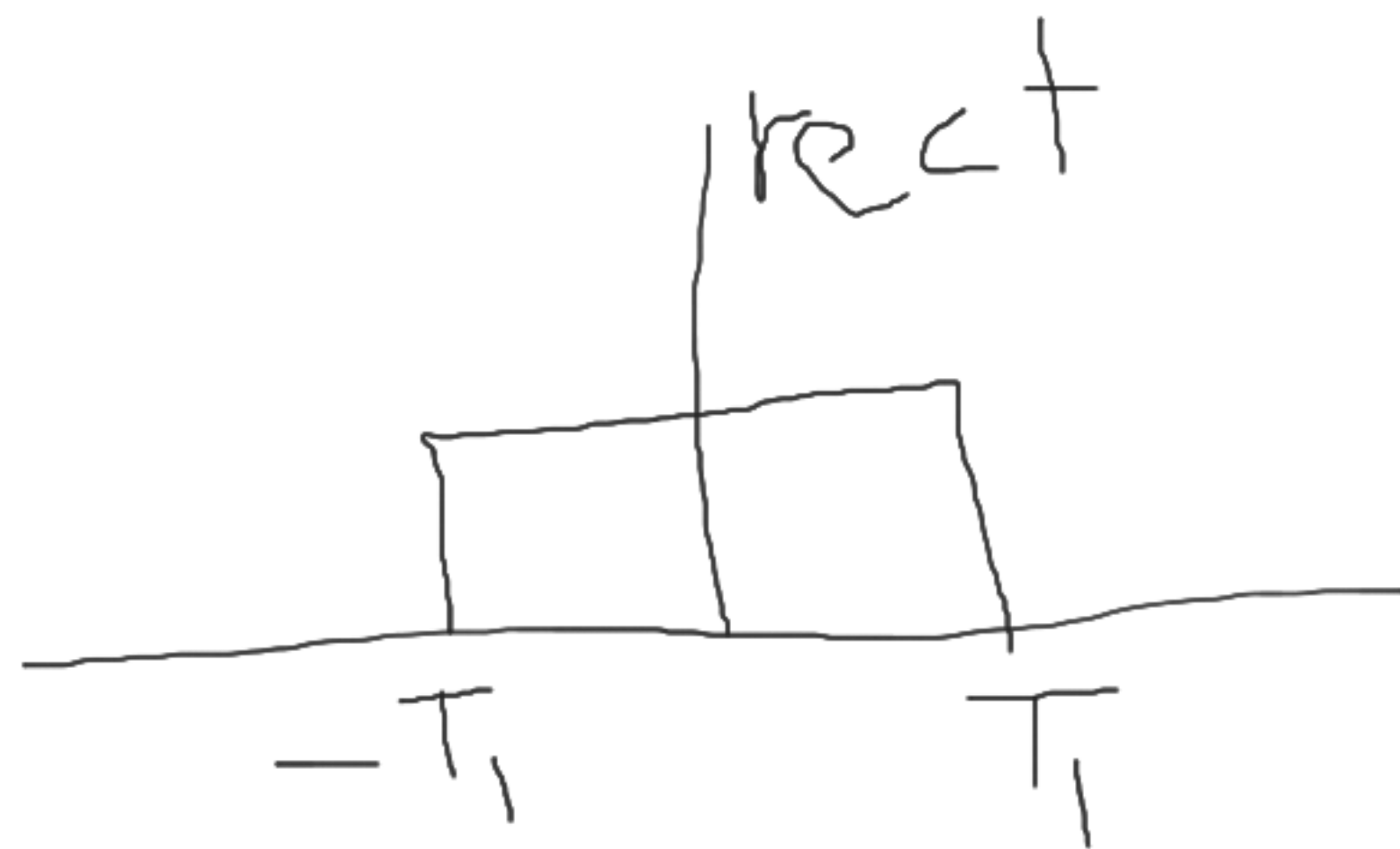
\checkmark

$$\left[\begin{array}{c} | \\ \bigcirc \end{array} \right] - \left[\begin{array}{c} | \\ | \end{array} \right] \quad \checkmark_2$$



$$\left[\begin{array}{c} | \\ \bigcirc \end{array} \right] - \left[\begin{array}{c} \bigcirc \\ | \end{array} \right] \quad \left[\begin{array}{c} | \\ | \end{array} \right]$$

$$\delta(t) = \int_{-\infty}^{\infty} e^{j\omega t} d\omega$$



\sin

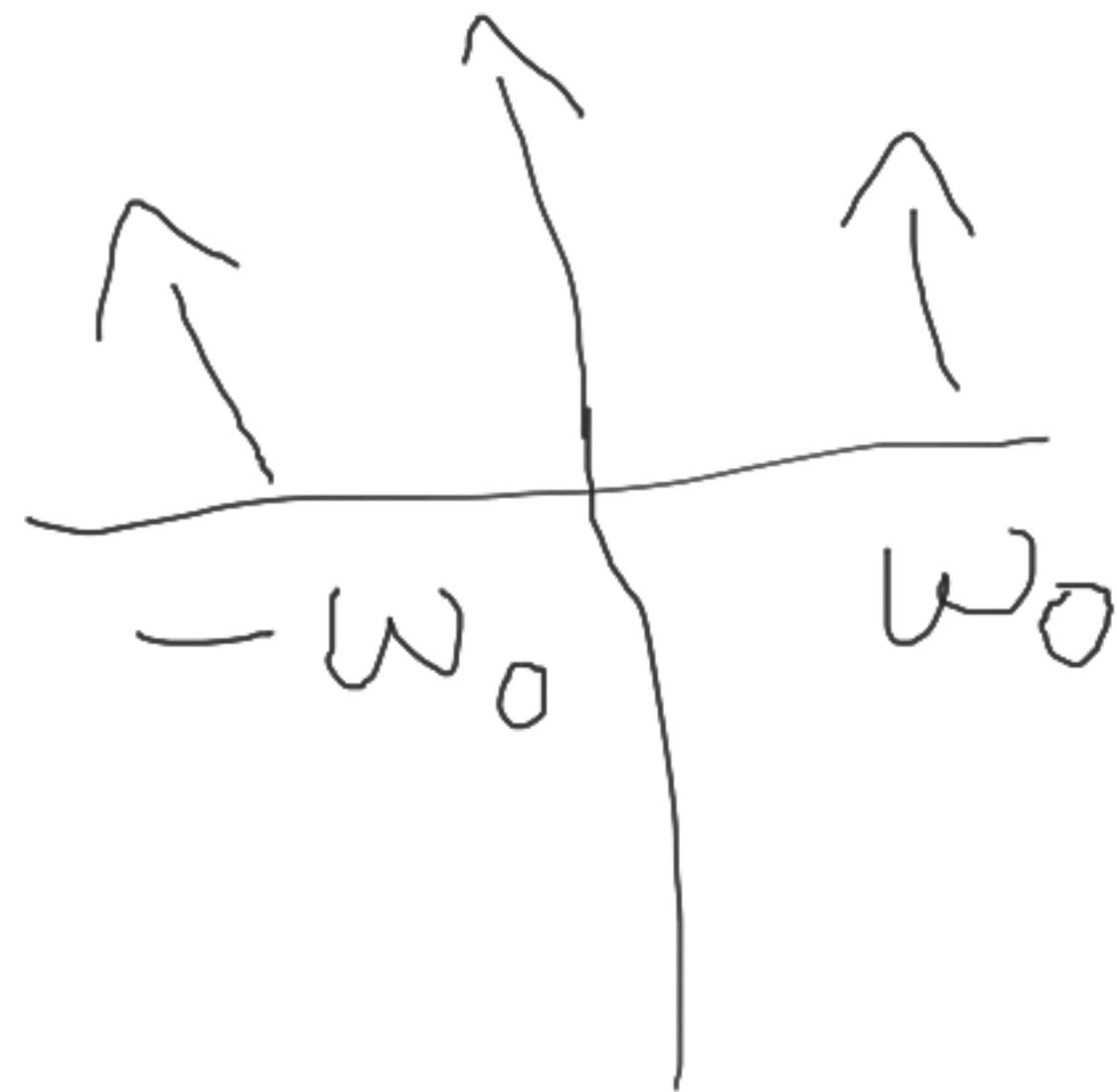
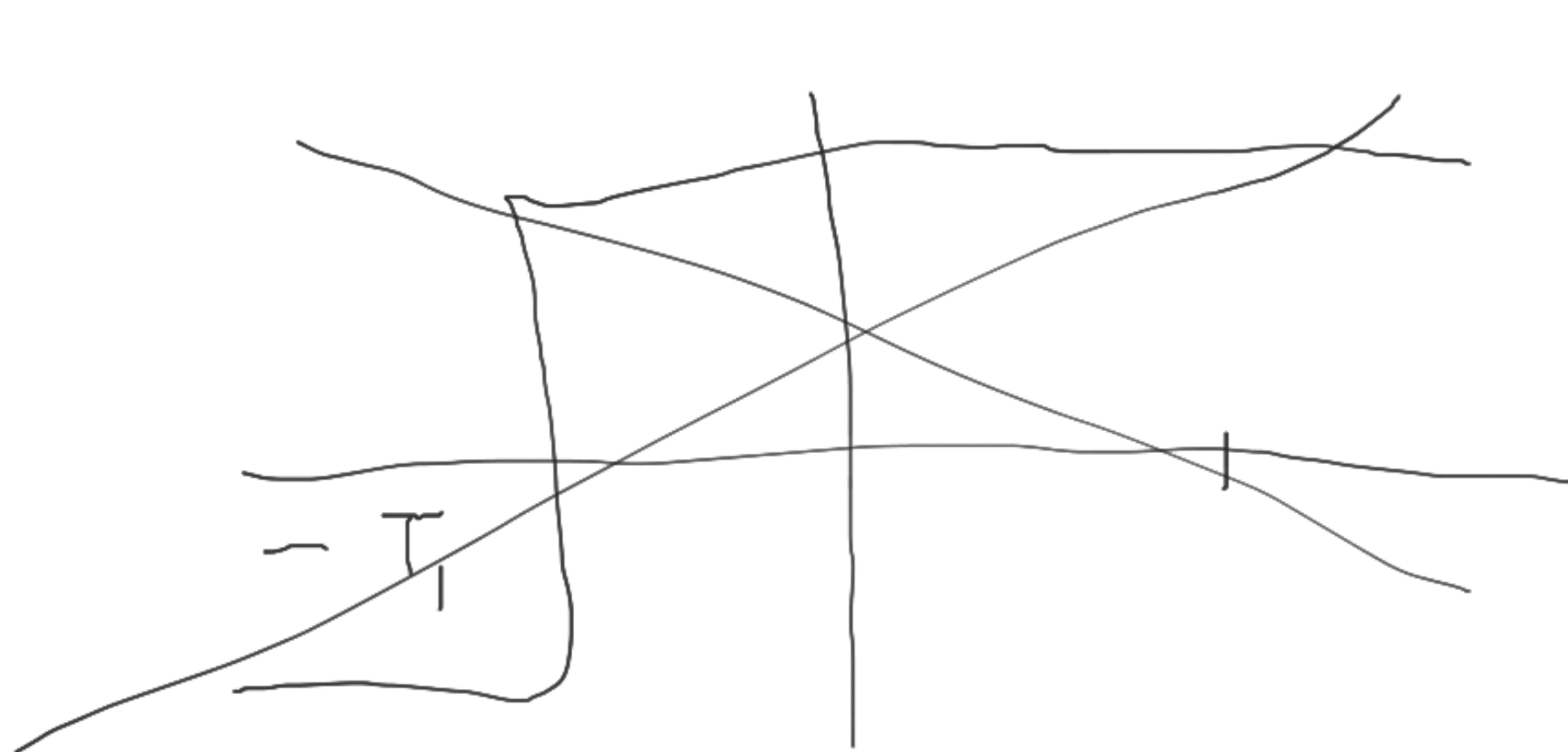


$$\underline{Av_1 = \lambda_1 v_1}, \quad \underline{Av_2 = \lambda_2 v_2}$$

$$\underline{A[v_1 \ v_2] = [v_1 \ v_2] \begin{bmatrix} \lambda_1 \\ \lambda_2 \end{bmatrix}}$$

$$\underline{AV = VD \Rightarrow \underline{V^{-1}AV = D}}$$

$$y(t) = \int_{-\infty}^{\infty} h(\tau) e^{j\omega(t-\tau)} d\tau$$



$$x(t) y(t) \longleftrightarrow \frac{1}{2\pi} X(\omega) * Y(\omega)$$

$x(j\omega)$



*

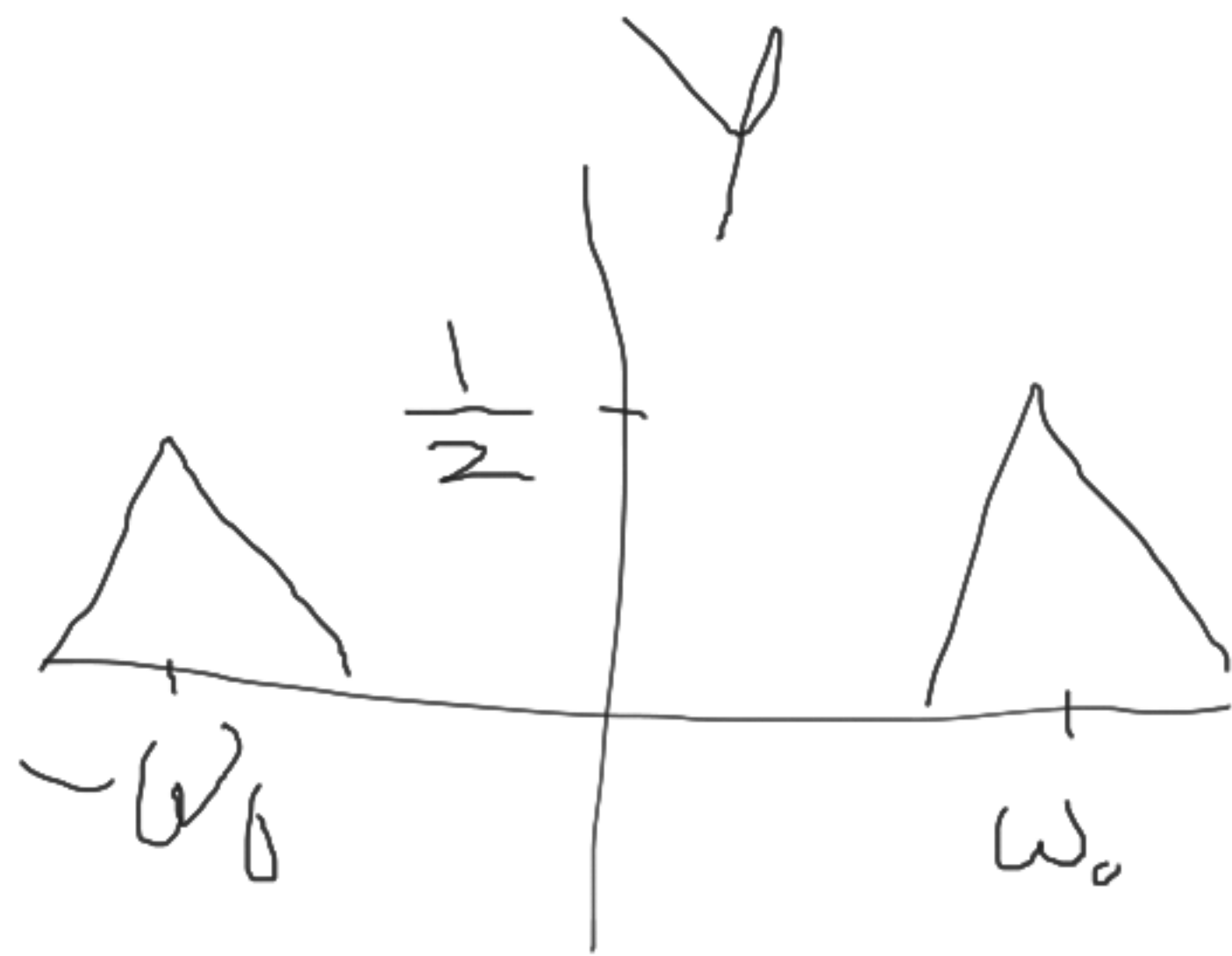




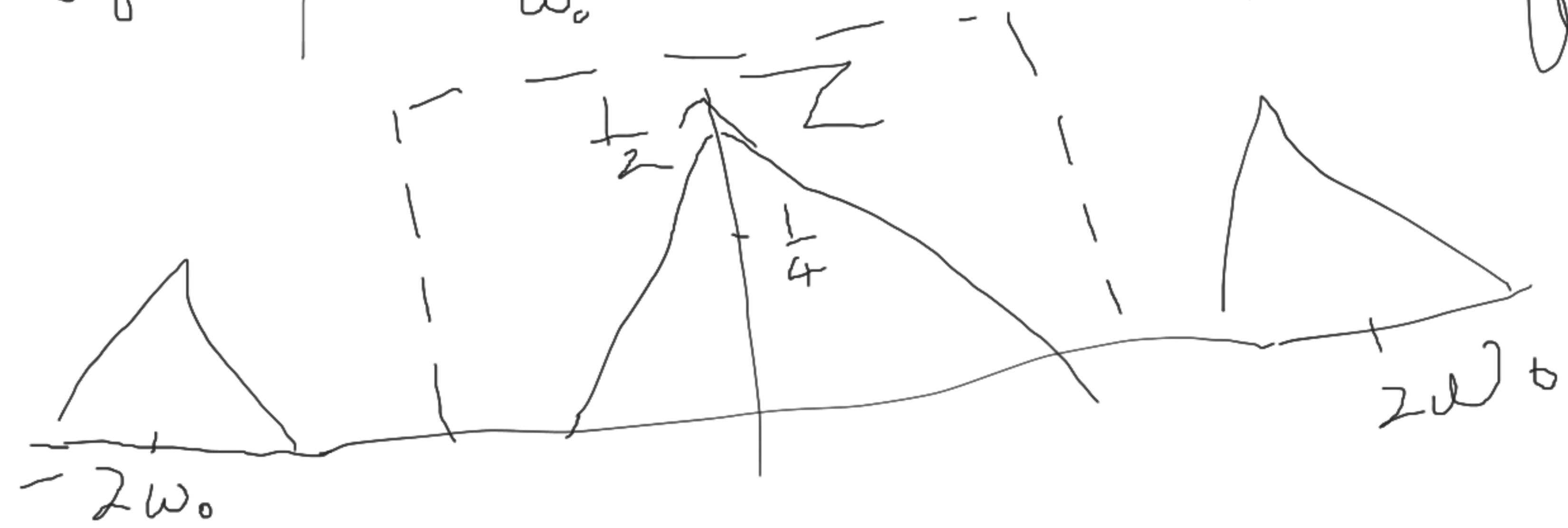
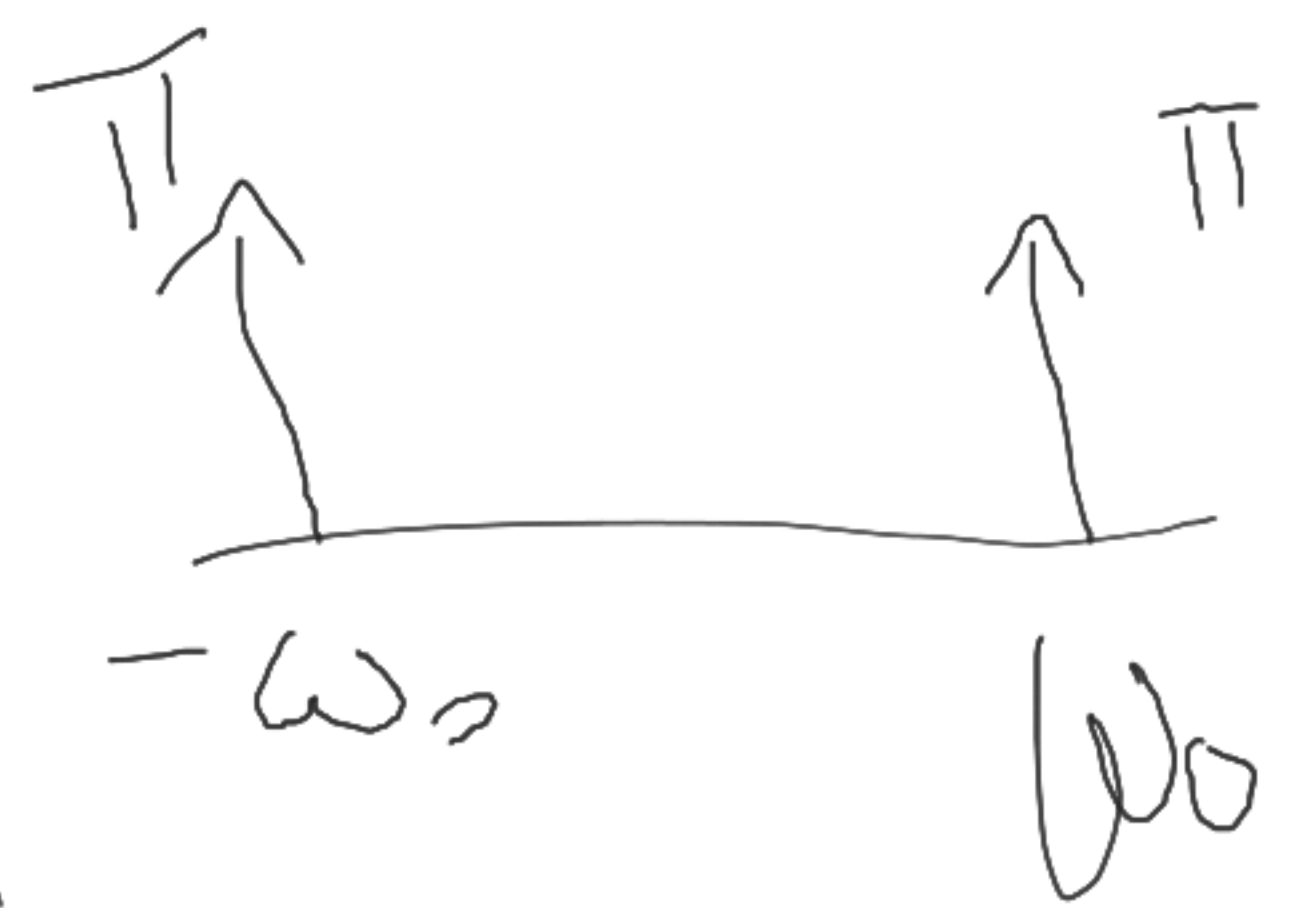
$$y = x \cdot \cos$$

$$z = y \cdot \cos$$

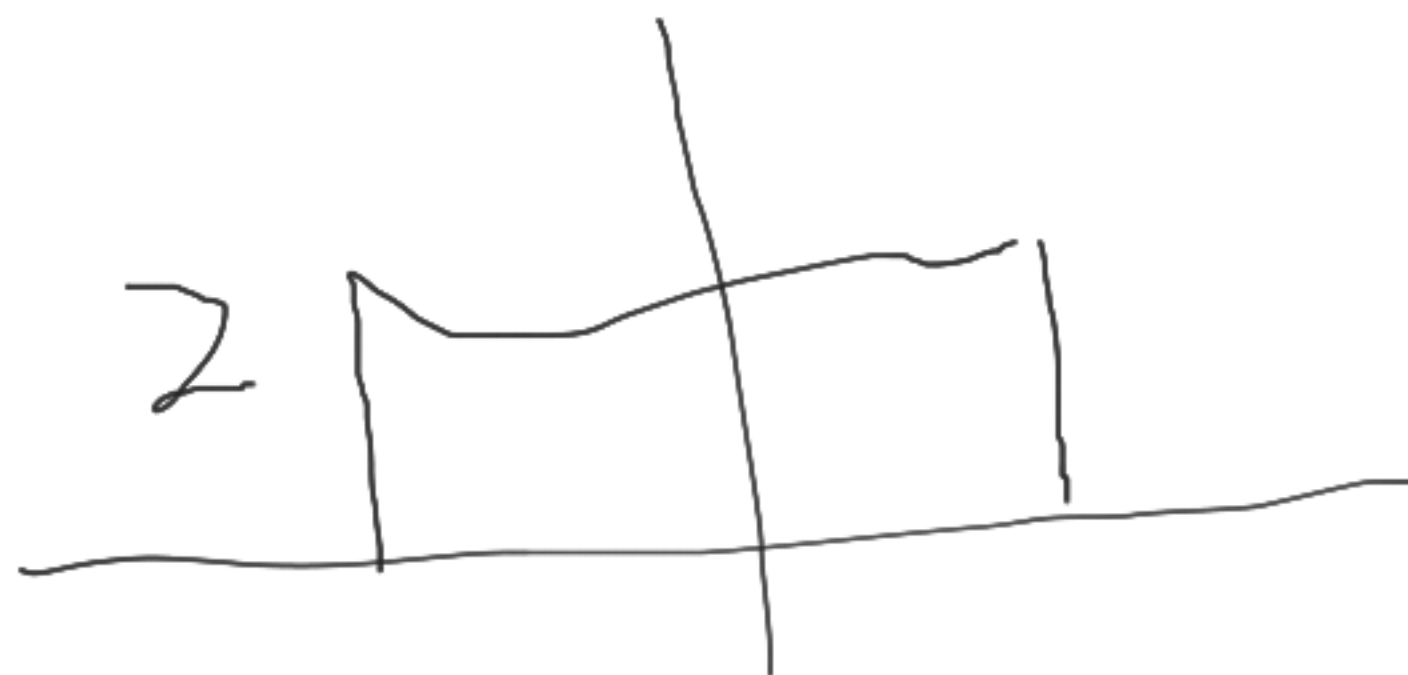
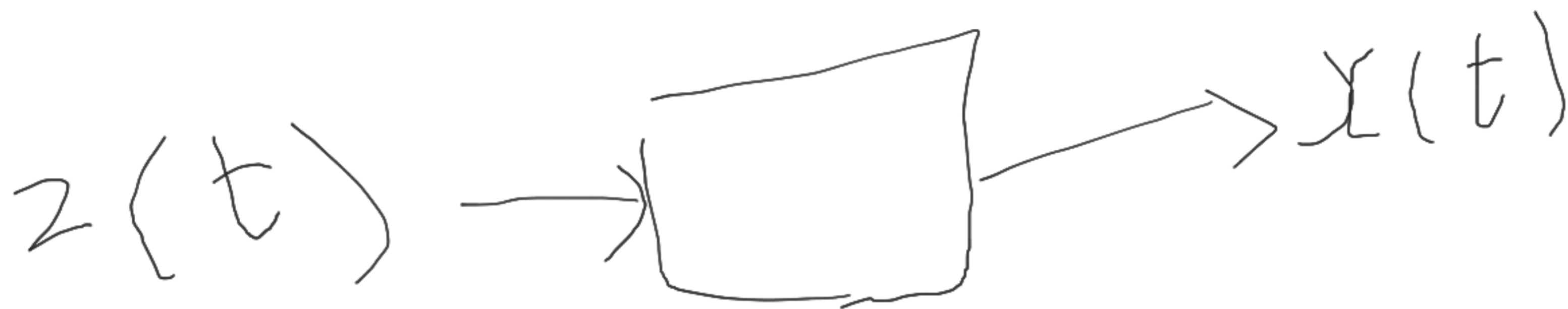
$$z = \frac{1}{2\pi} * ()$$



$\frac{1}{2\pi}$
*



recon. X from Z ?



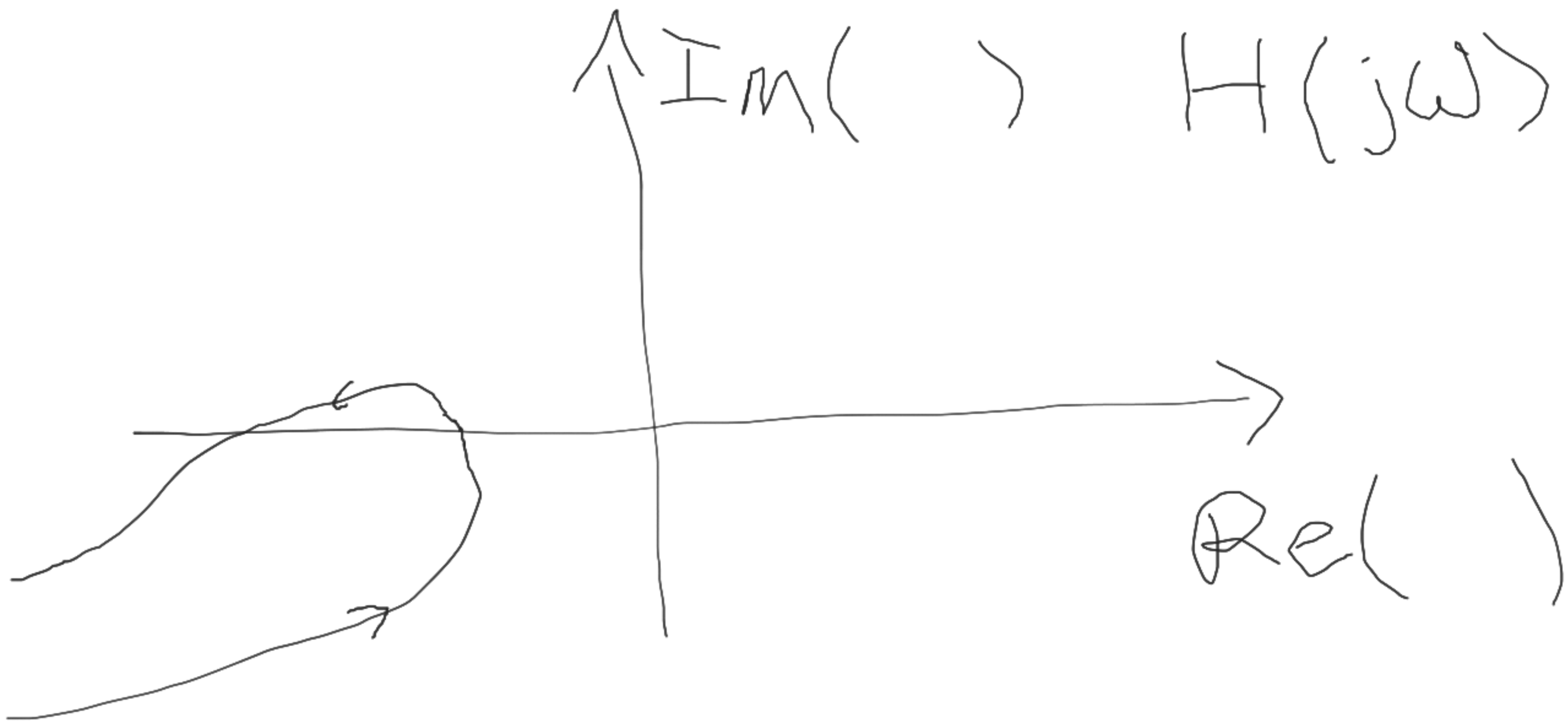
$$\frac{1}{2} z(t) \leftrightarrow \frac{1}{2} X(j\omega)$$

$$Z(j\omega) = \mathcal{F}\{z(t)\}(\omega)$$

$$z(t) * \text{sinc}(t)$$

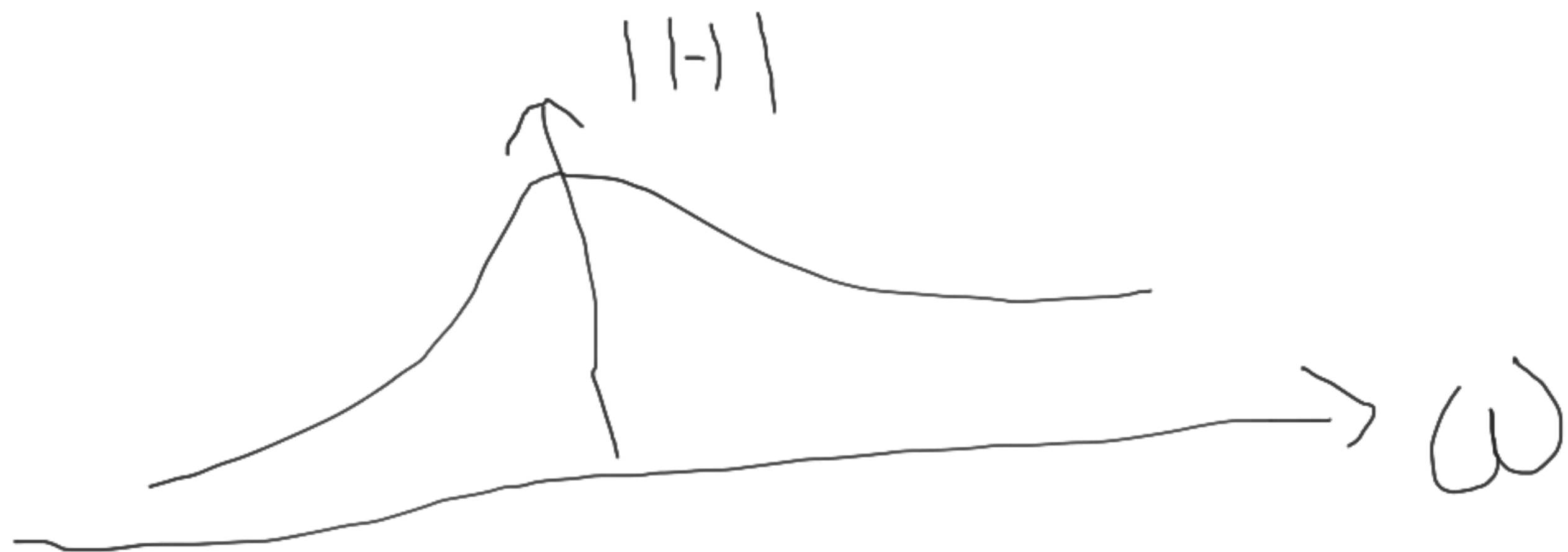
$$\parallel$$

$$x(t)$$



$$H(j\omega) = |H| \angle \ominus$$





$$\text{Ex. } H(j\omega) = \frac{1}{a + j\omega}$$

$$|H| = \frac{1}{\sqrt{a^2 + \omega^2}}$$

$$\angle H = -\tan^{-1}\left(\frac{\omega}{a}\right)$$

Sampling

Time :



\times



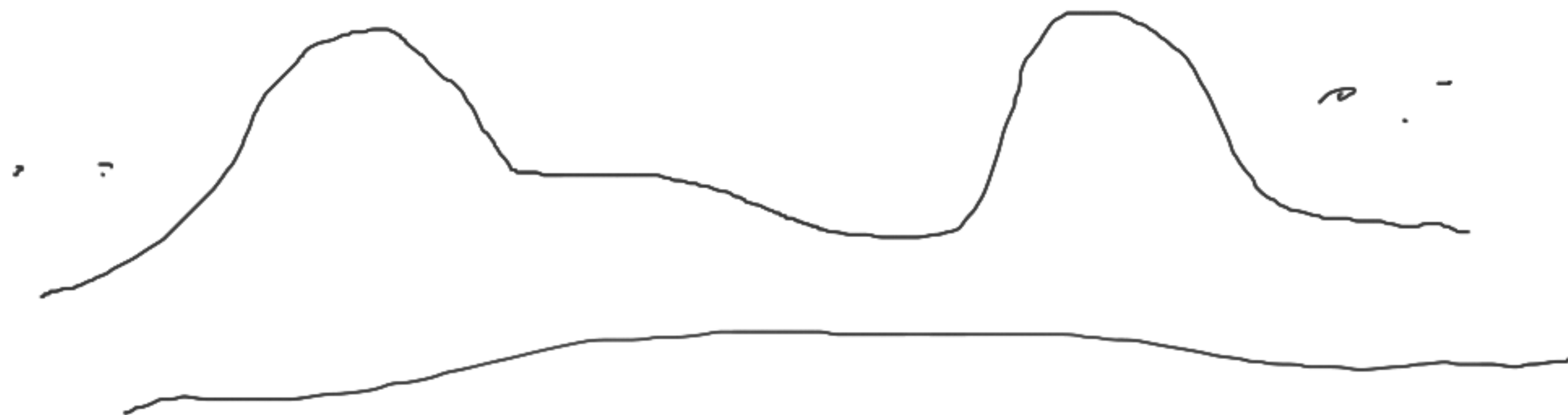
$=$



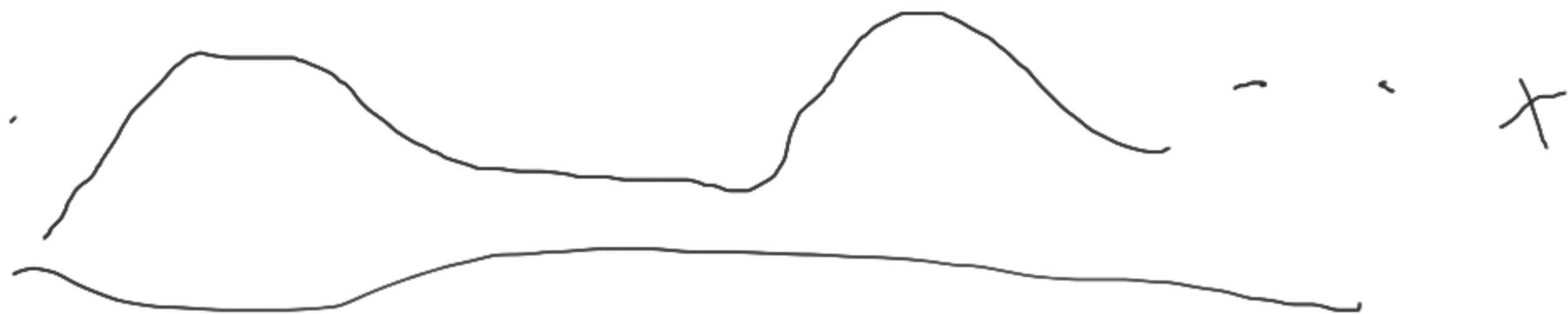
Freq. :



*



Freq; Sampl.



Digitizing in T&F

T

F



periodic in $T \& F$ (OF T)