

Reactive Power Q

$\frac{1}{2} V_m I_m \sin \theta \leftarrow \text{VAR}$

Volt Ampere (Reactive)

$$Q \stackrel{\text{def}}{=} \frac{1}{2} V_m I_m \sin (\phi_v - \phi_i) \quad \text{VAR}$$

$+ve$
 $-ve$

Resistor :

$$Q = 0 \text{ VAR}$$

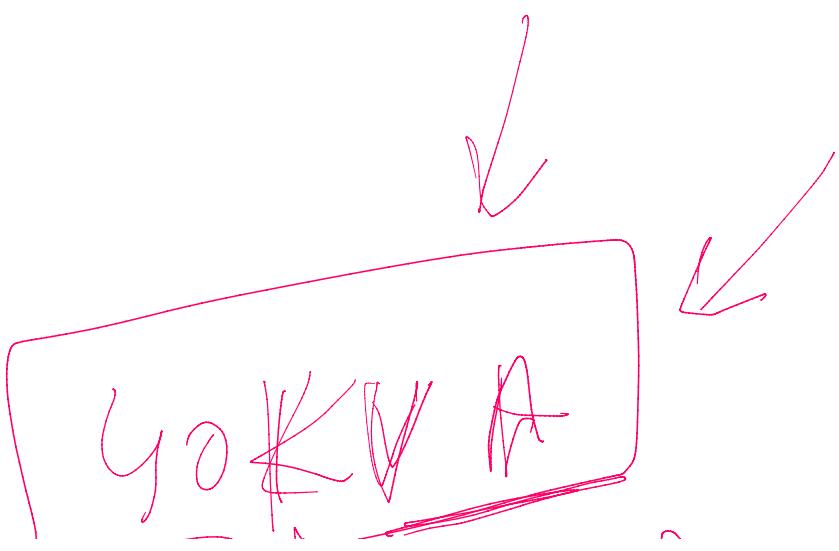
$$\text{Inducto/cap} \quad \frac{1}{2} V_m I_m \text{ vars}$$

$$Q = +ve \Rightarrow \text{Inductive power}$$

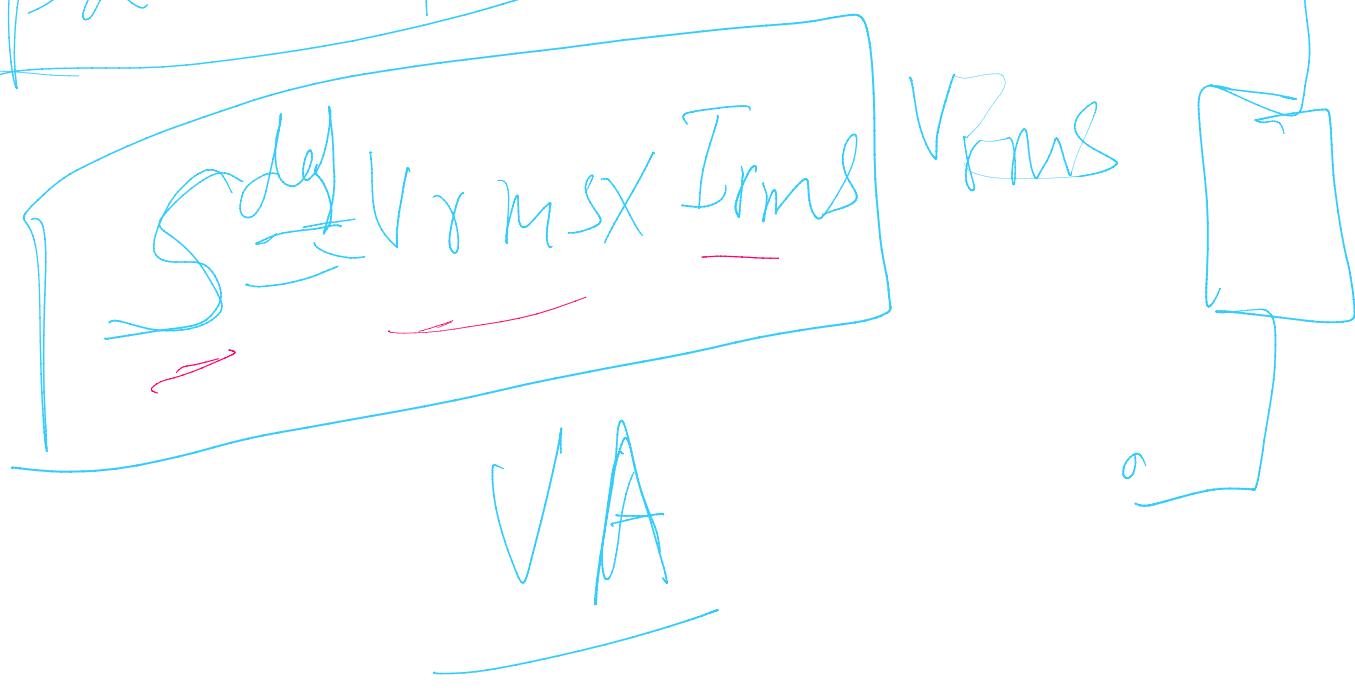
$$Q = -ve \Rightarrow \text{Capacitive delivery}$$

Apparent Power :

Imps



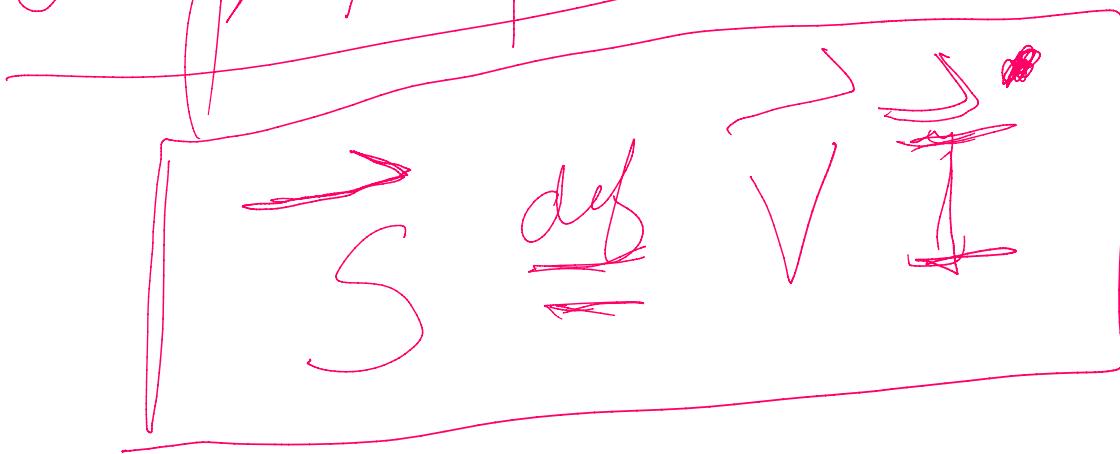
HAPPAREN TUVV



Volt Ampere

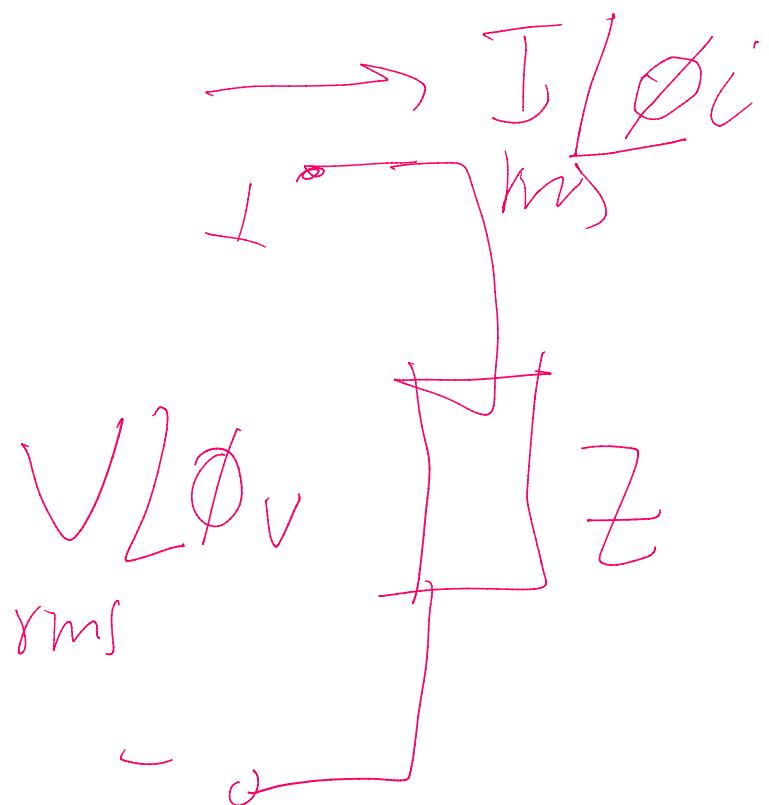
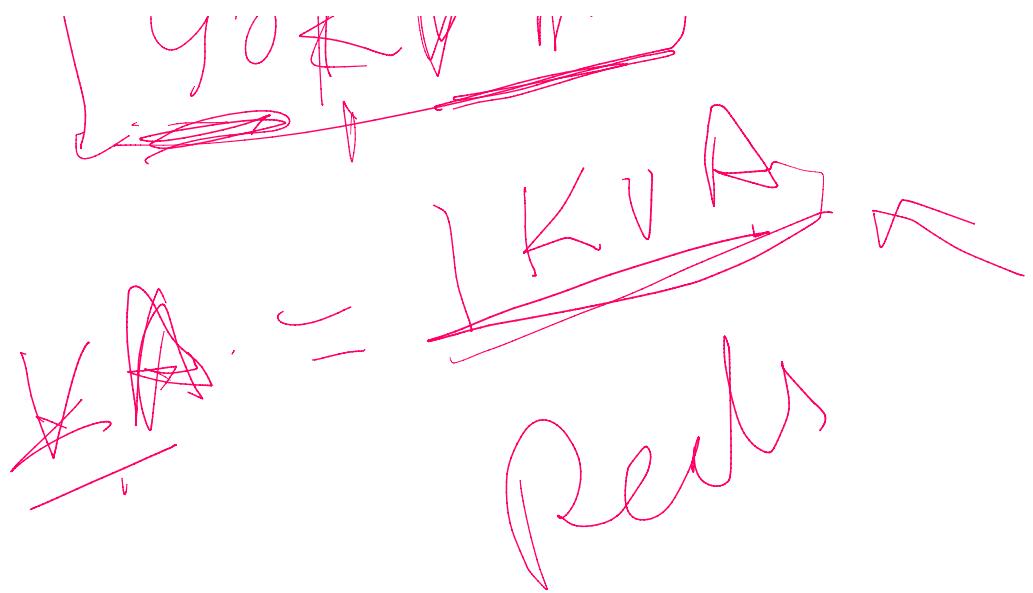
V

Complex Power:



VA

$$P = S \cos \phi$$



$$P = VI \cos(\phi_V - \phi_i) \text{ Watts}$$

A hand-drawn equation showing the power P as the product of voltage V and current I times the cosine of the phase difference between the voltage and current, resulting in watts.

$$S = P + jQ$$

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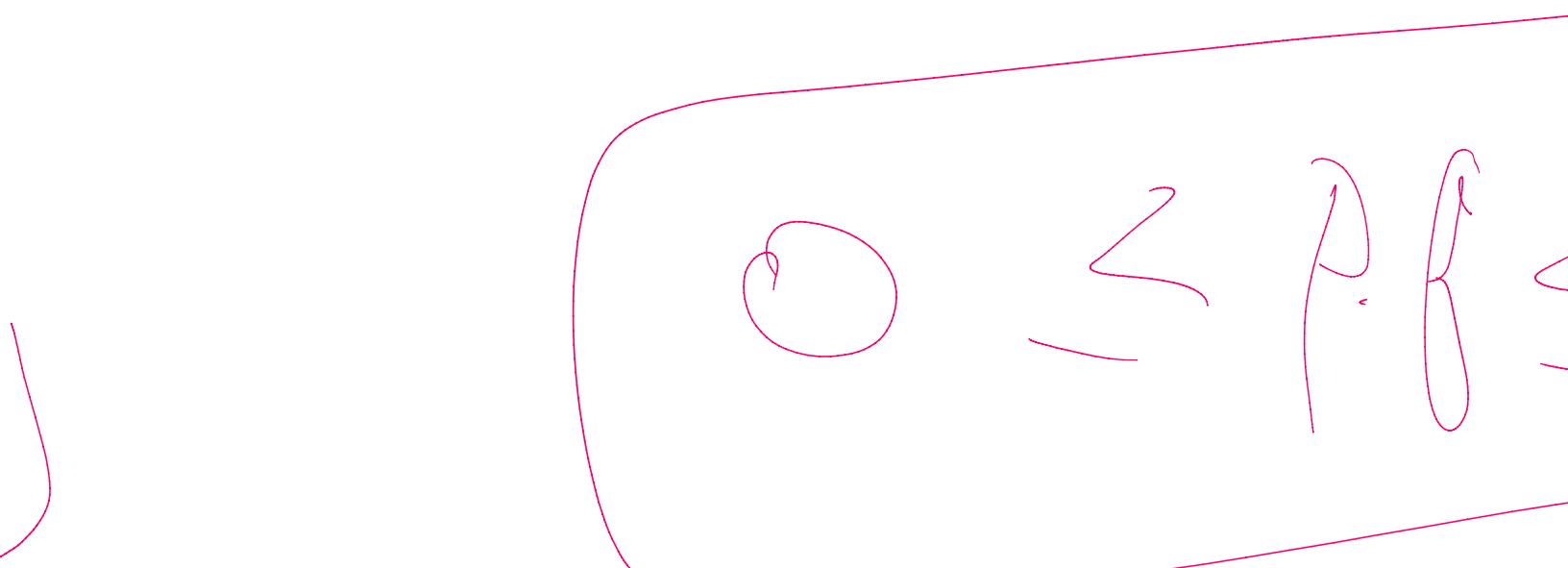
$$|S| = S = VA$$

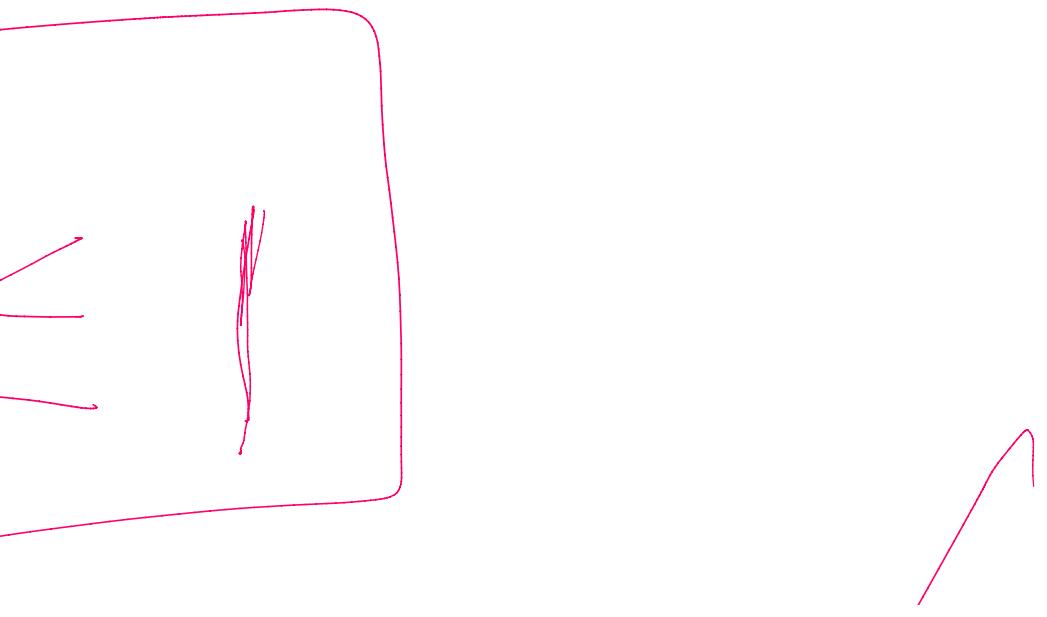
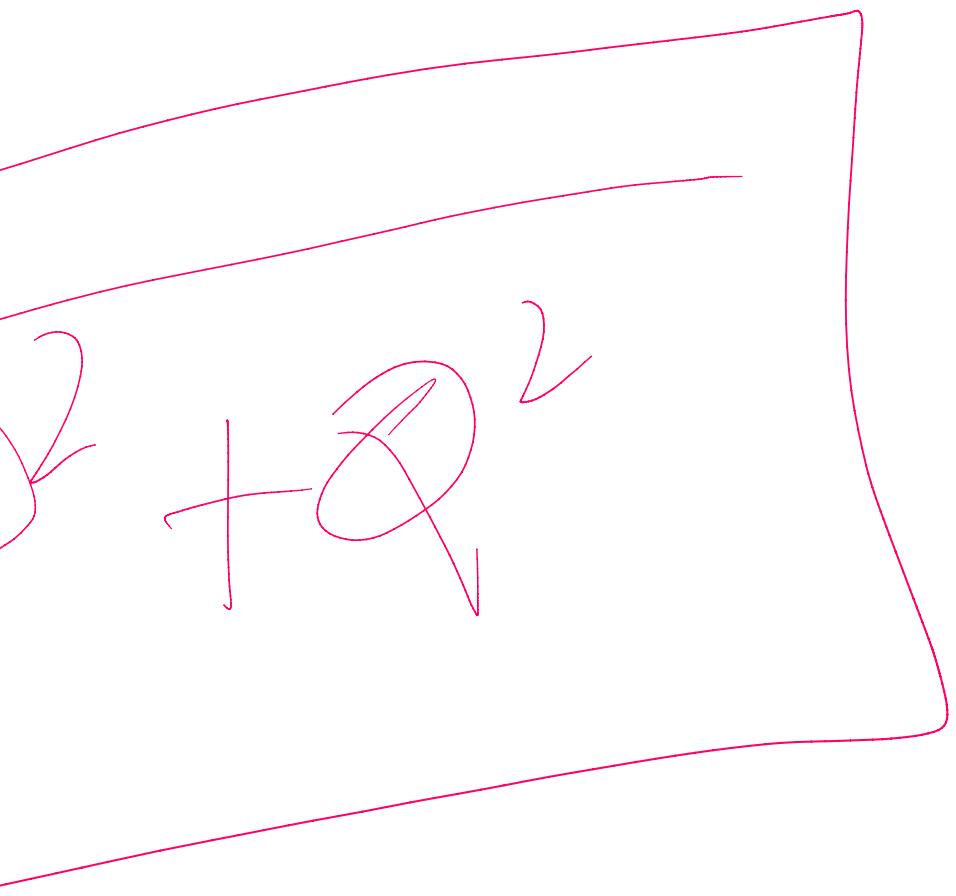
$$\phi = \phi_2 = \phi_V - \phi$$

Power Factor

$$Pf = \cos \phi_S$$

$$P = V I \cos(\phi_V - \phi_I) \text{ VAR}$$
$$Q = V I \sin(\phi_V - \phi_I) \text{ VAR}$$

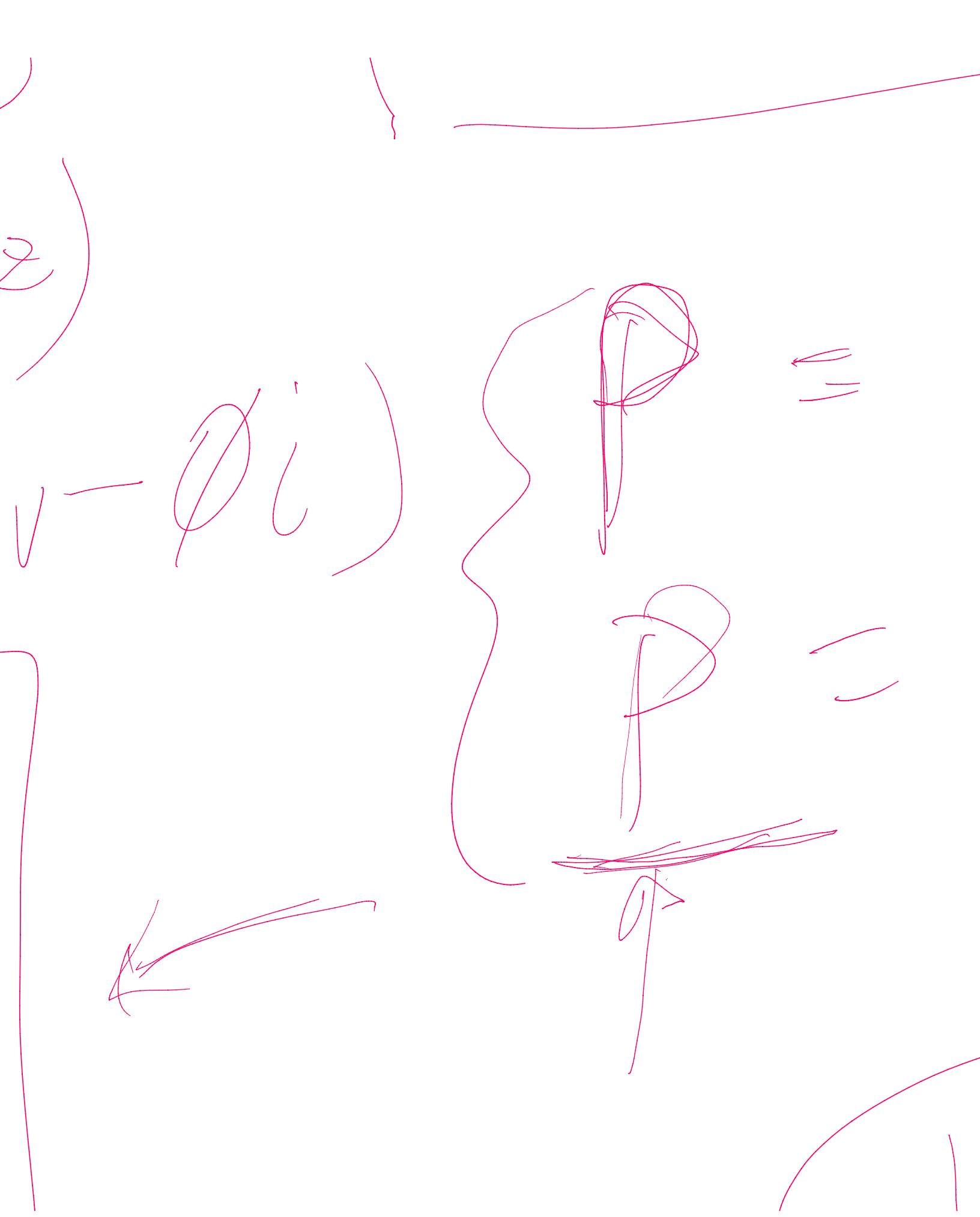




$$T \cdot \begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} w & 0 \\ 0 & y \end{pmatrix} \begin{pmatrix} x \\ y \end{pmatrix} = \cos(\phi) \begin{pmatrix} x \\ y \end{pmatrix}$$

$$= \begin{pmatrix} w & 0 \\ 0 & y \end{pmatrix} \begin{pmatrix} x \\ y \end{pmatrix}$$

$$\begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} w & 0 \\ 0 & y \end{pmatrix} \begin{pmatrix} x \\ y \end{pmatrix}$$



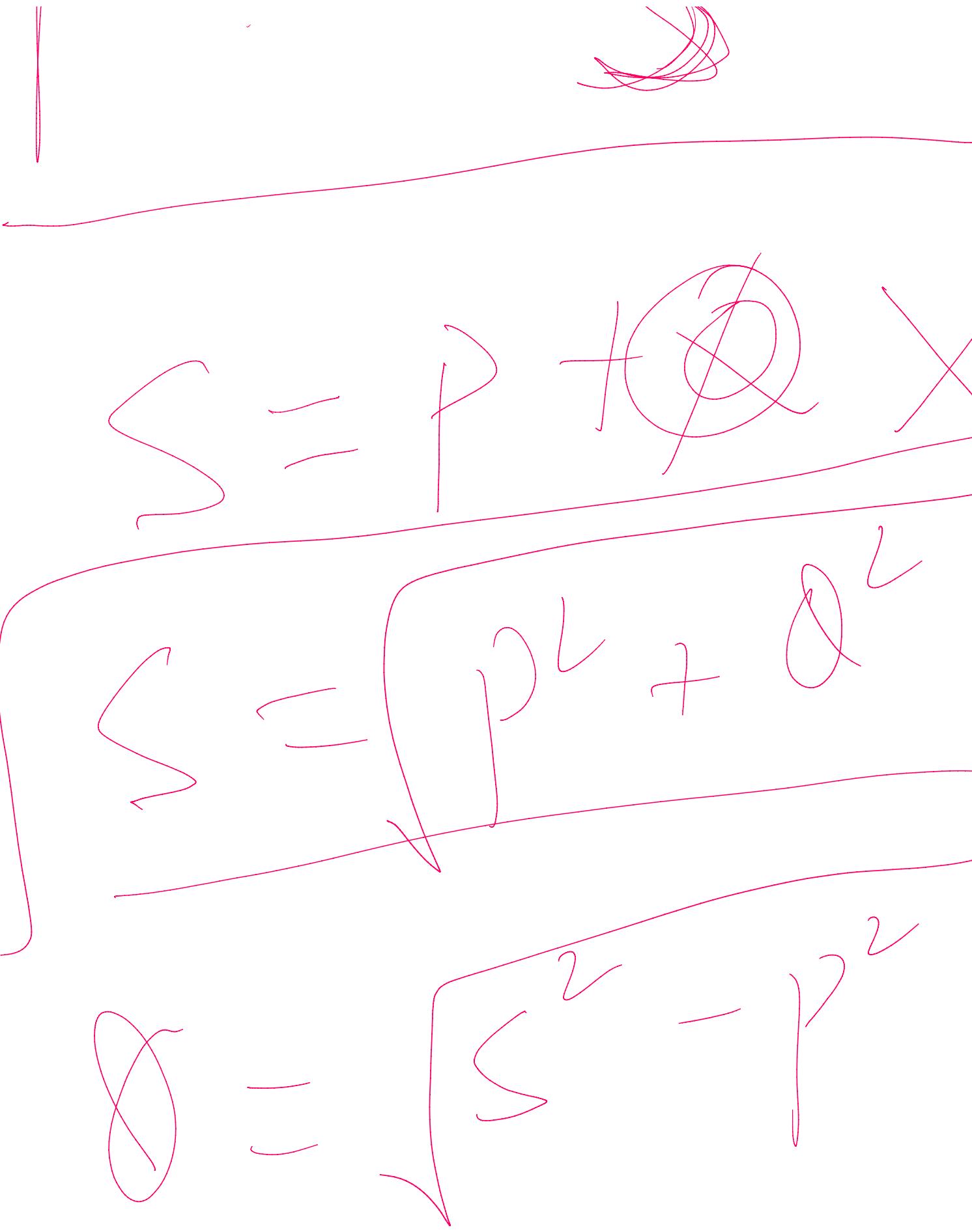
S X D. J V

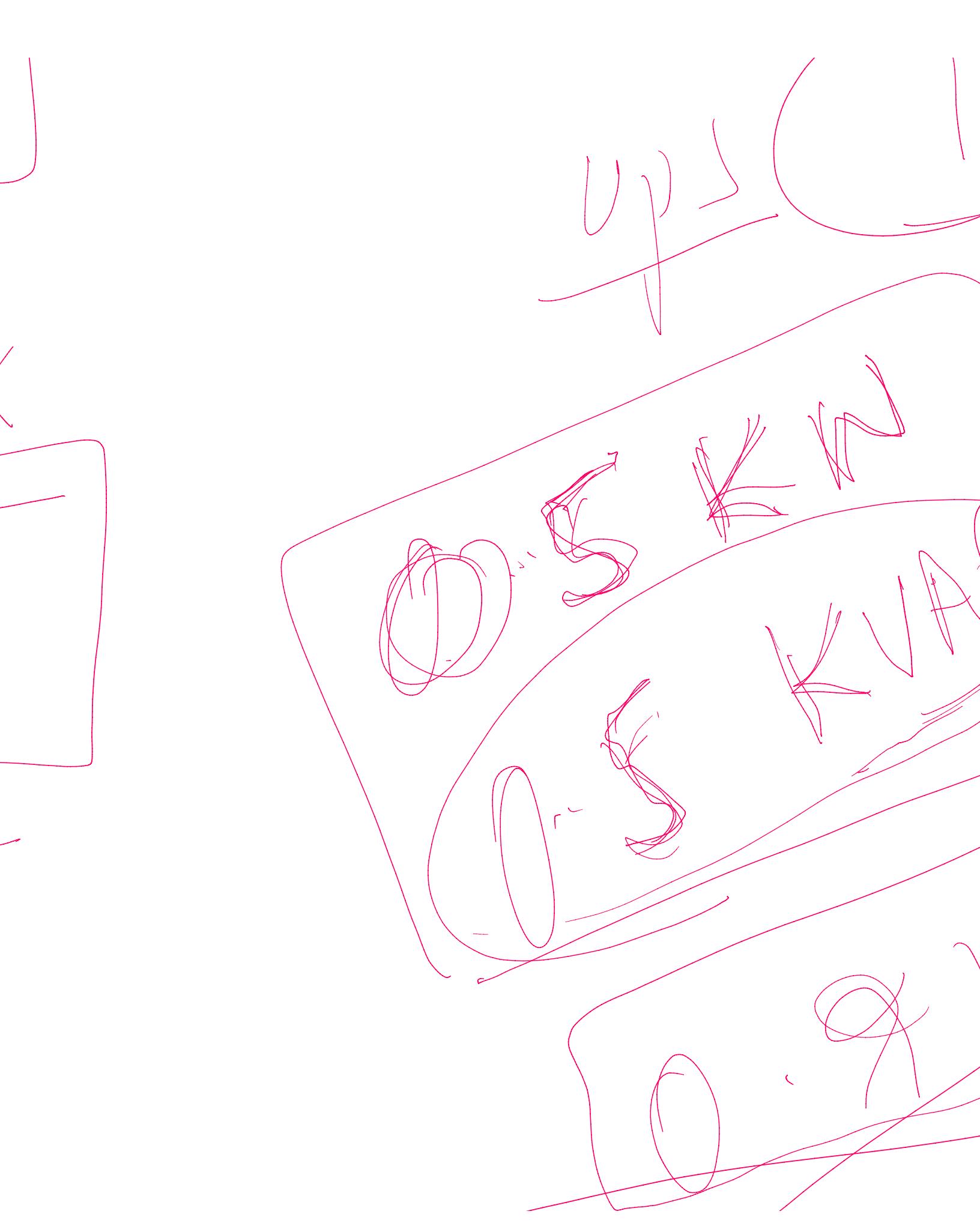
S X CO () V - A

KVA

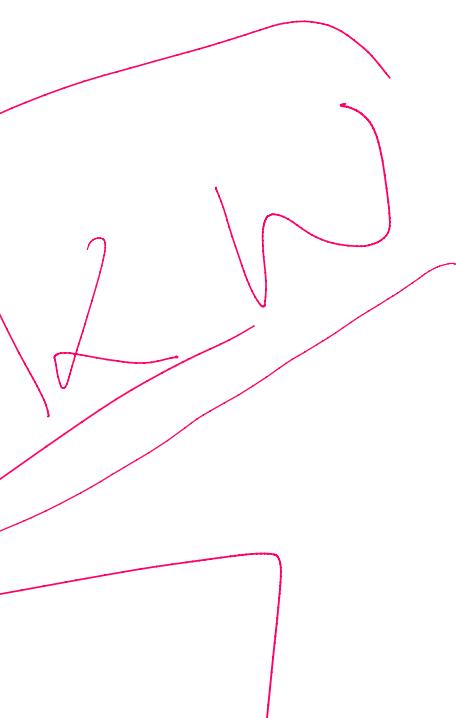
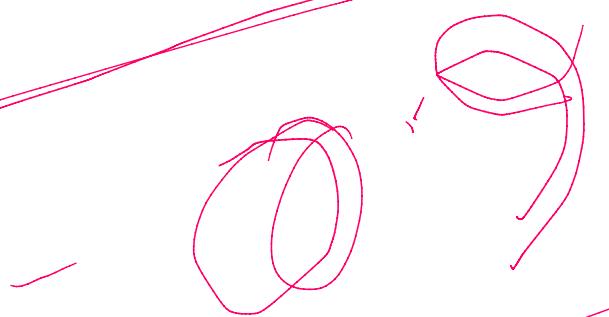
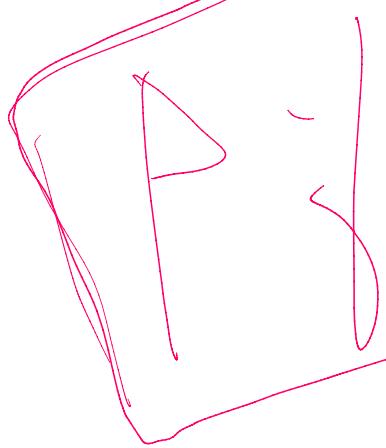
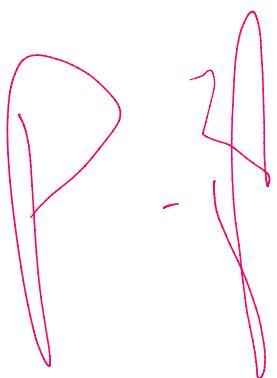
0

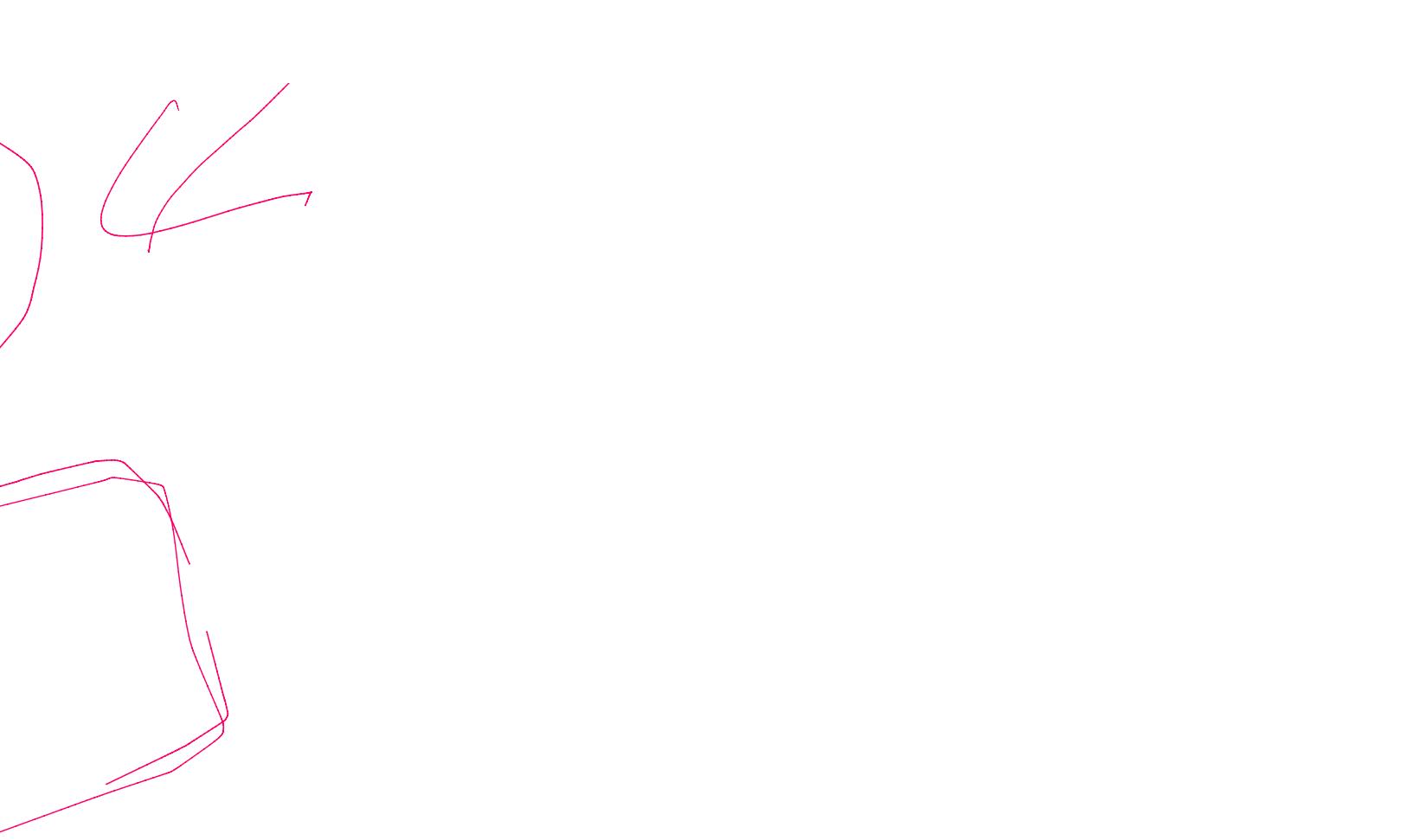






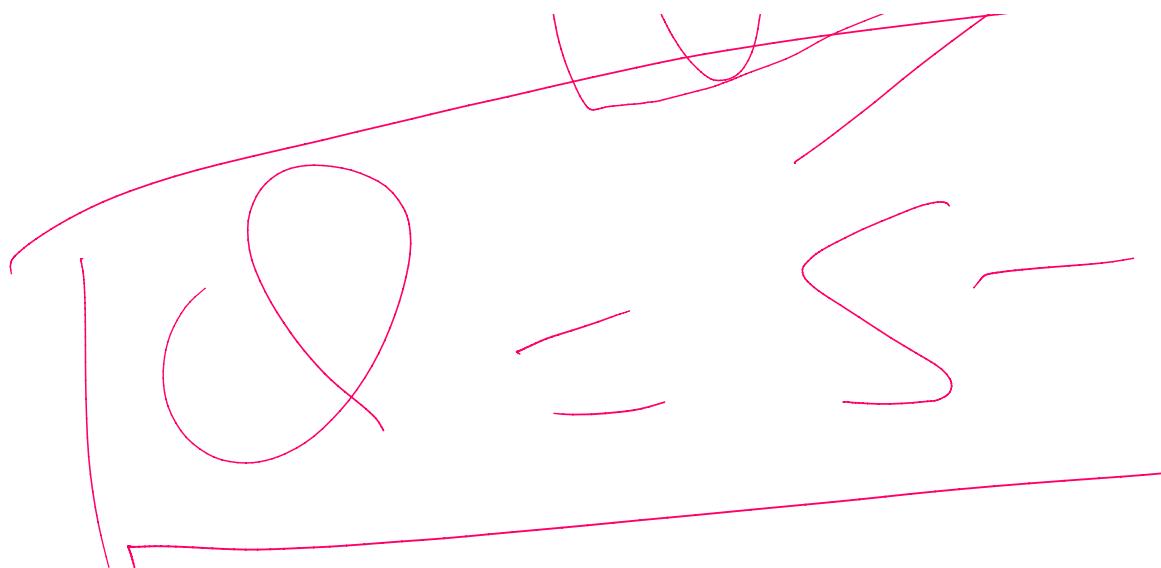
KUVI





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P

