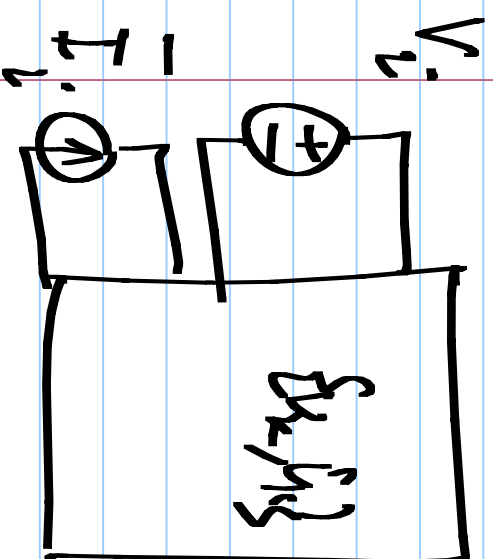


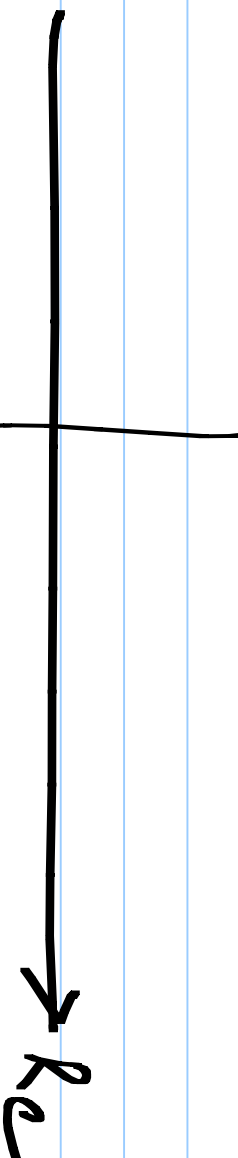
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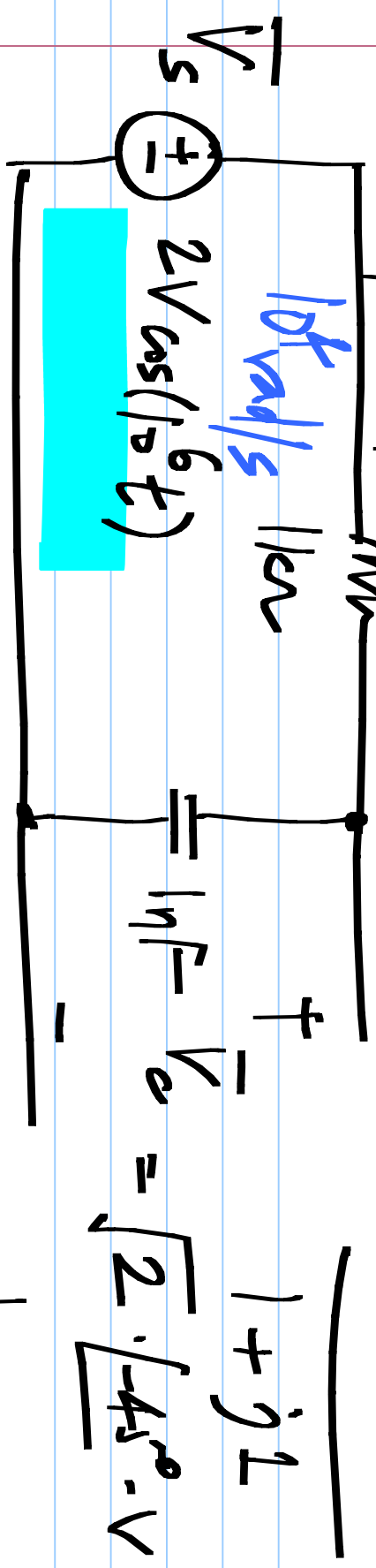


$$\underline{v_{k,i}, i} \rightarrow \underline{V_k, I_k}$$

$\uparrow \text{Im}$ $\left\{ \begin{array}{l} \text{complex} \\ \text{numbers} \end{array} \right.$

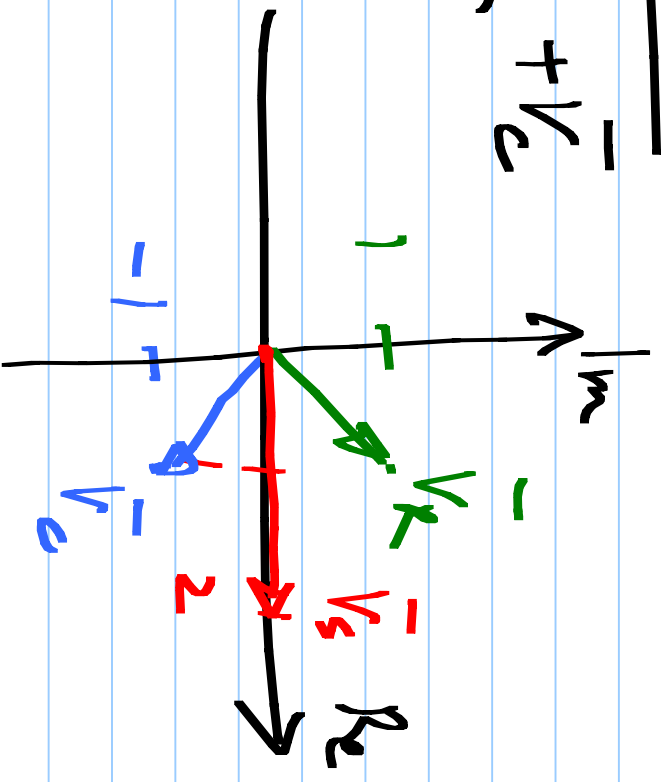


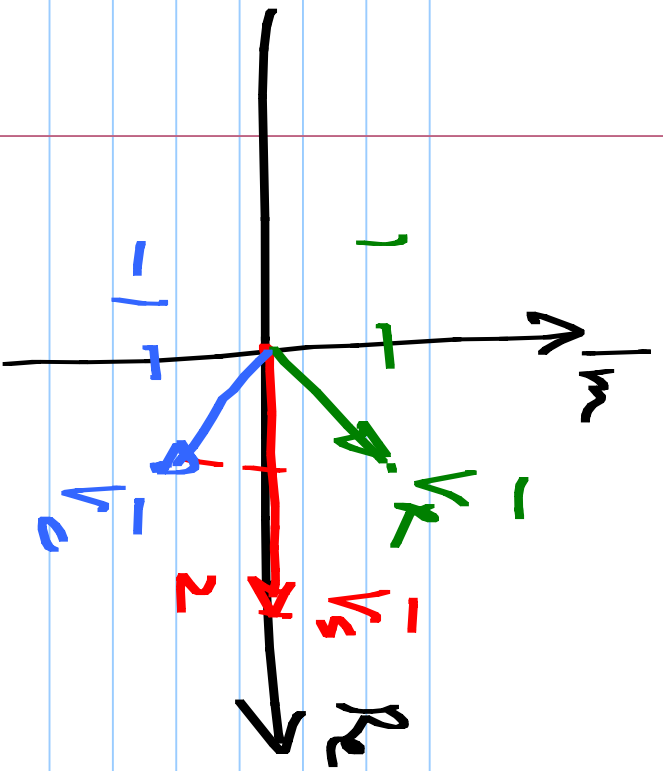
$$\omega = 10^6 \text{ rad/s} + \sqrt{2} \angle +45^\circ$$



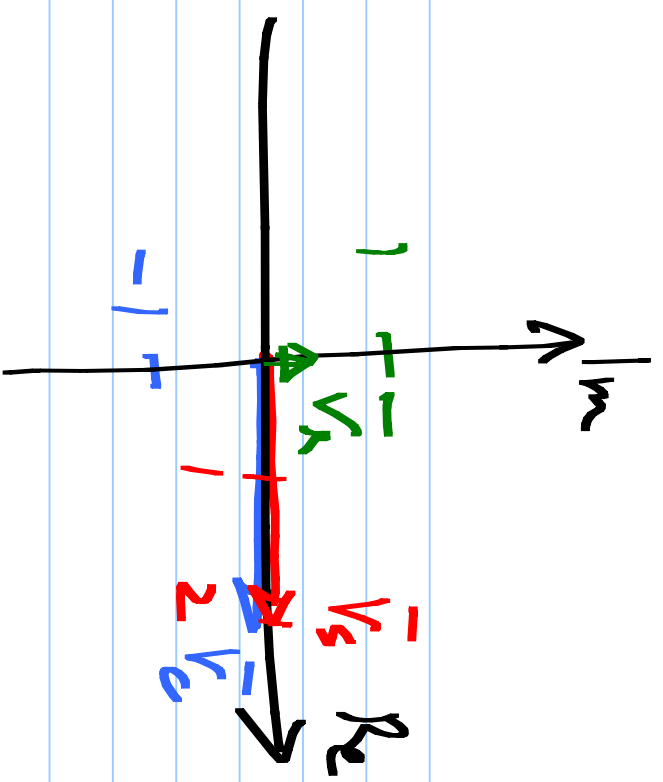
$$\underline{V}_s = \underline{V}_R + \underline{V}_C$$

Amplitude } phase
 (refers to $\cos()$)



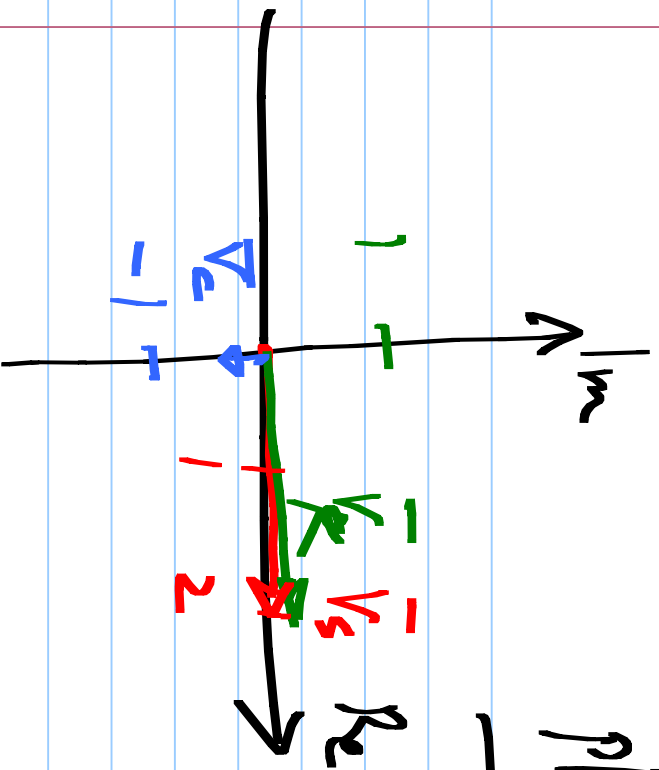


② 10^6 rad/s

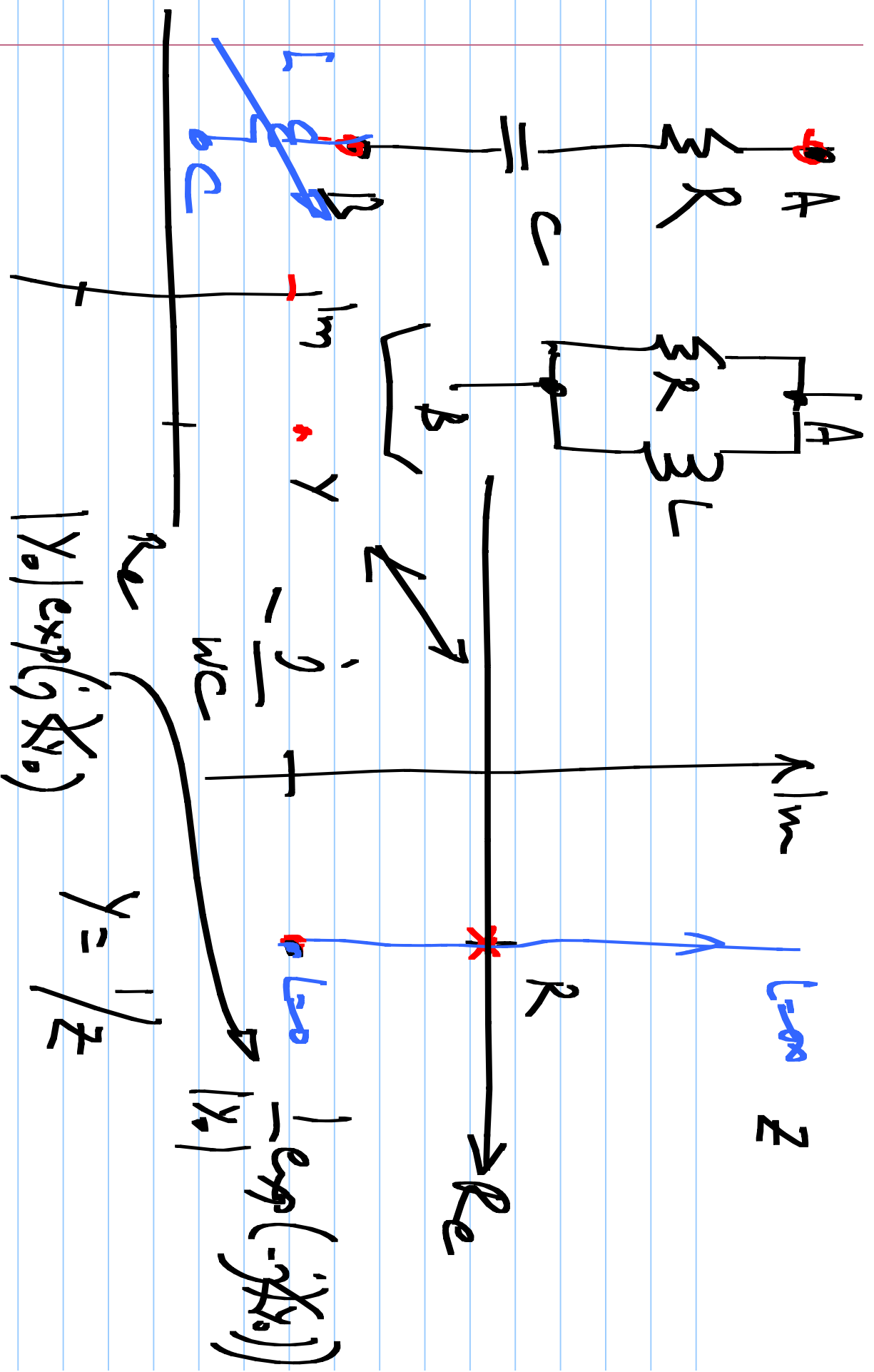


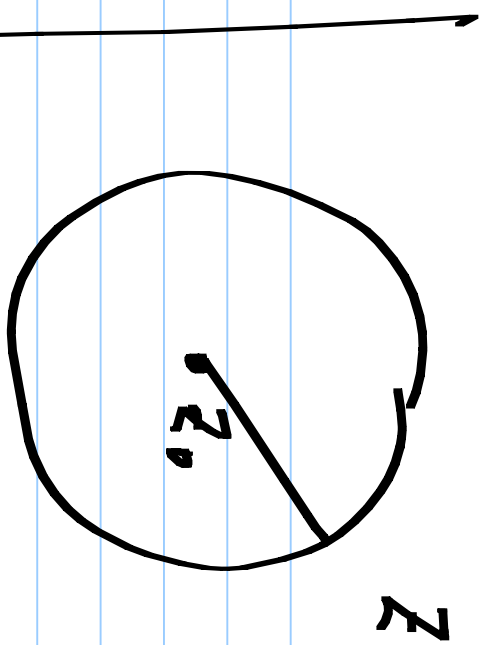
② 10^4 rad/s

Phasor Diagrams



Q. 10^8 rad/s





$$(z - z_0)(z - z_0)^* = r^2$$

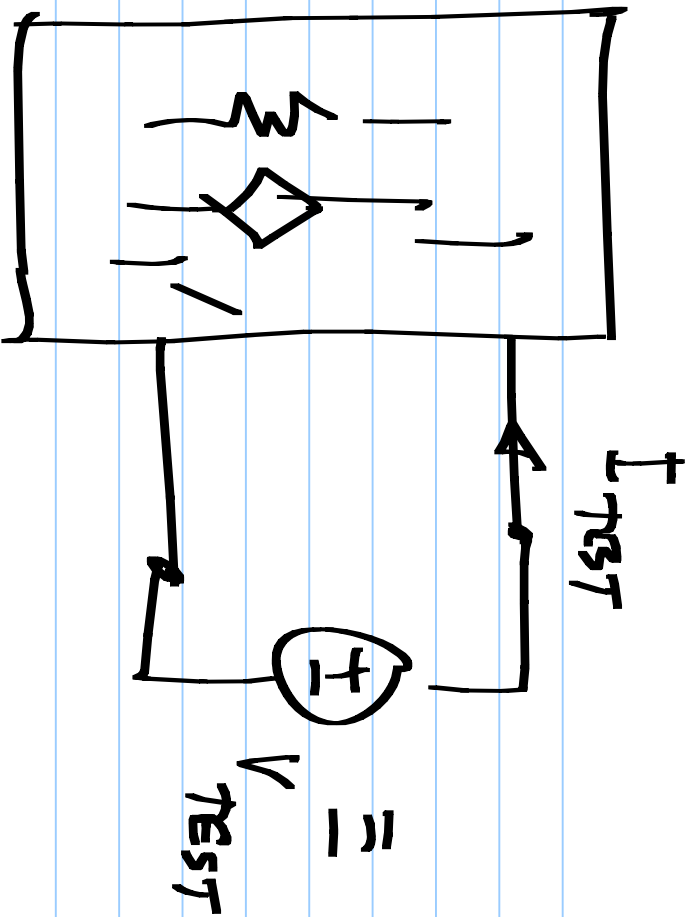
$$\sqrt{|z - z_0|} = r$$

$$y = mx + c$$

$$z = x + jy$$

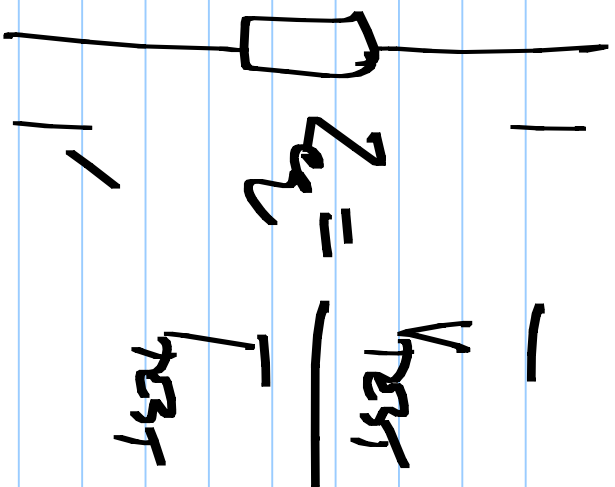
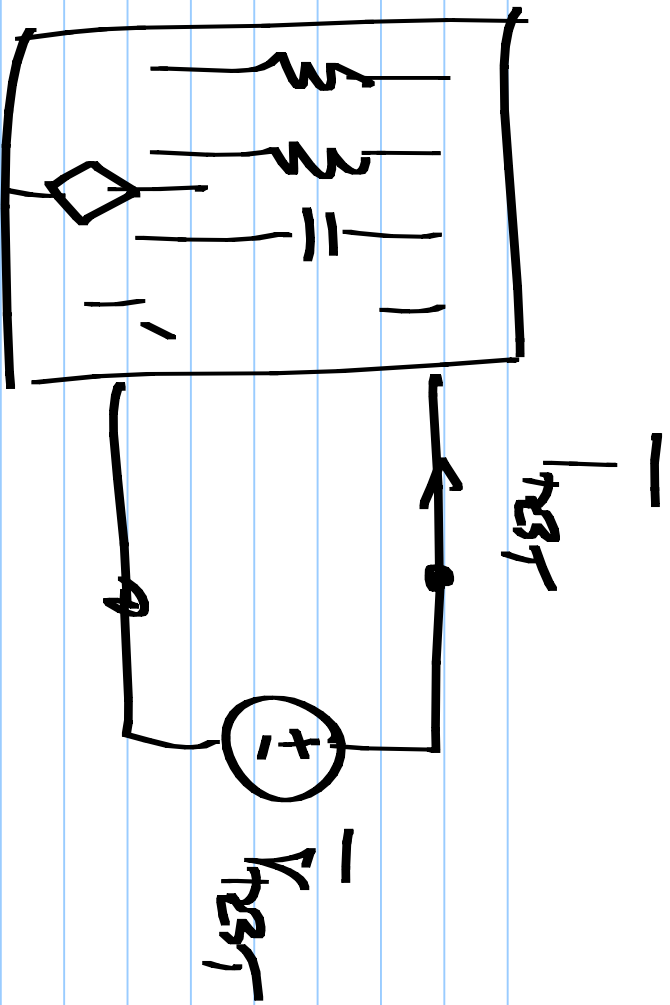
$$\frac{z + z^*}{2x_0} + \frac{z - z^*}{j2y_0} = 1$$

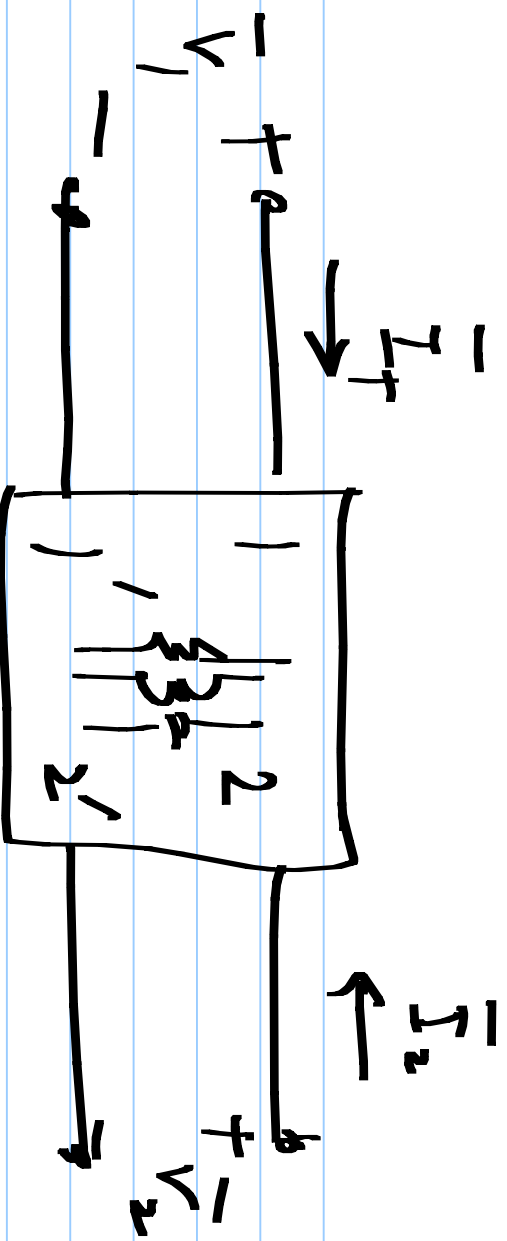
$$\frac{x}{x_0} + \frac{y}{y_0} = 1$$



$$R_{eq} = \frac{V_{test}}{I_{test}}$$

A hand-drawn equivalent circuit diagram showing a resistor labeled R_{eq} connected between two terminals. The resistor is drawn with a zigzag line.

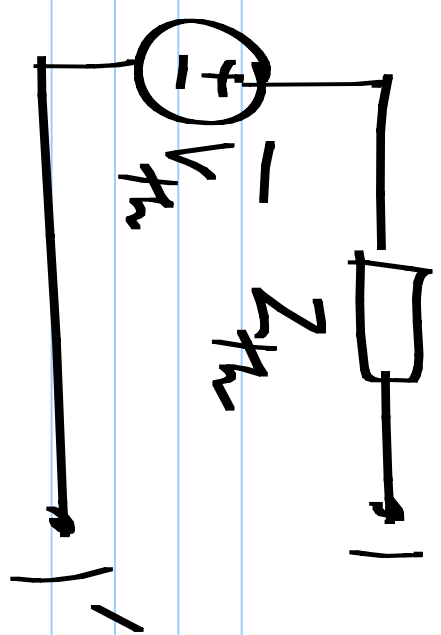
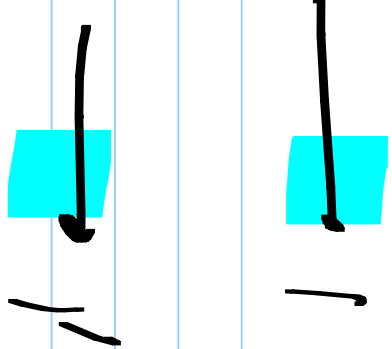
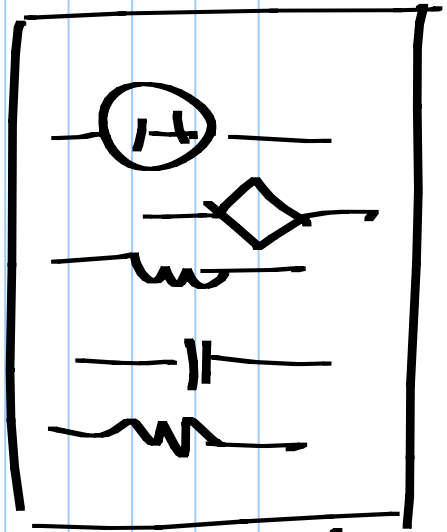




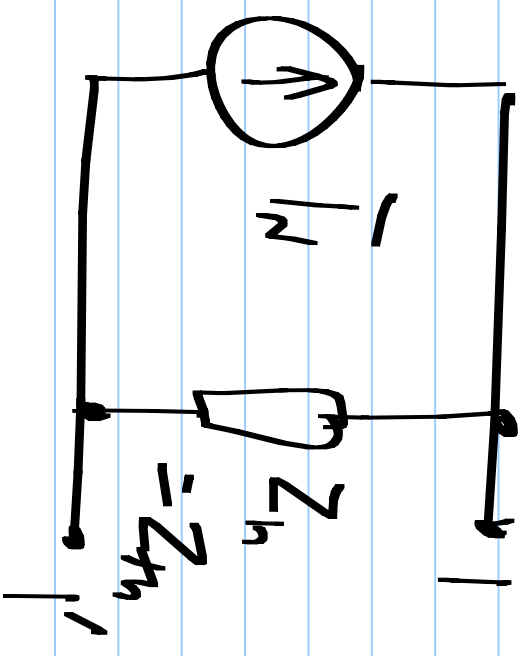
g, z, h, f

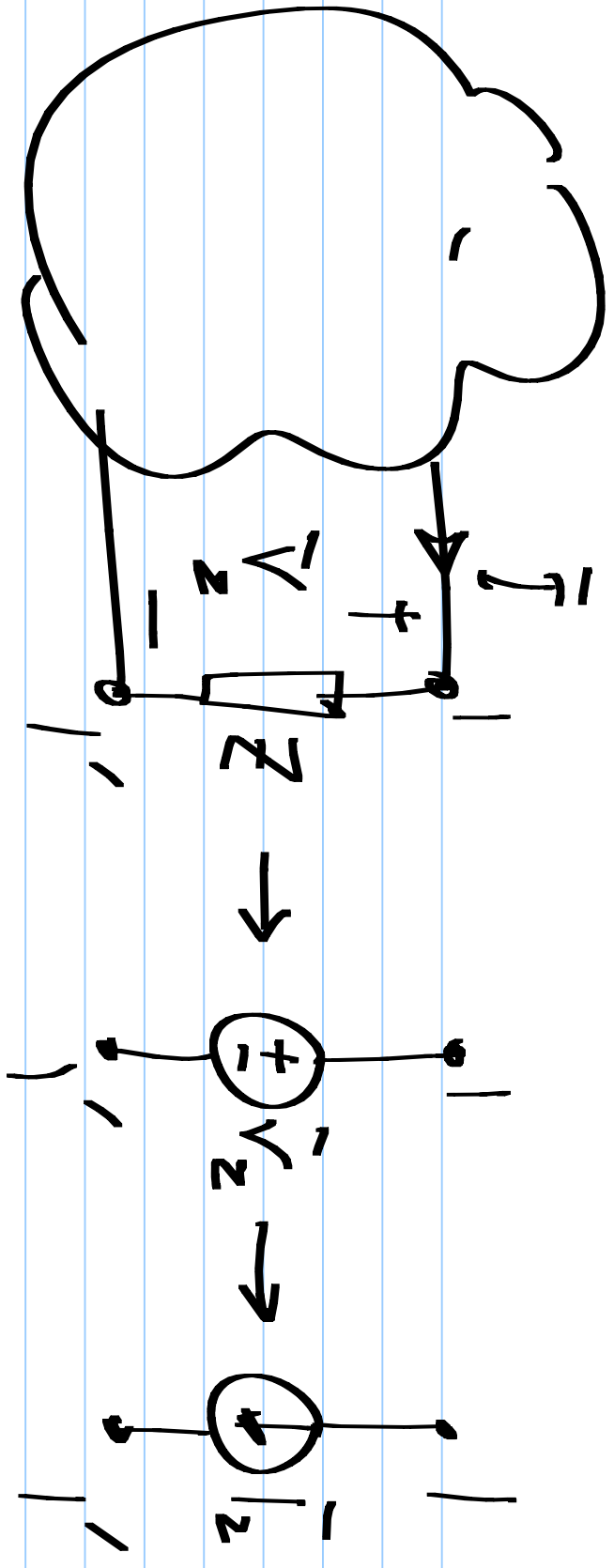
$$\begin{bmatrix} I_1 \\ I_2 \end{bmatrix} = \begin{bmatrix} y_{11} & y_{12} \\ y_{21} & y_{22} \end{bmatrix} \begin{bmatrix} V_1 \\ V_2 \end{bmatrix}$$

Complex



ii)





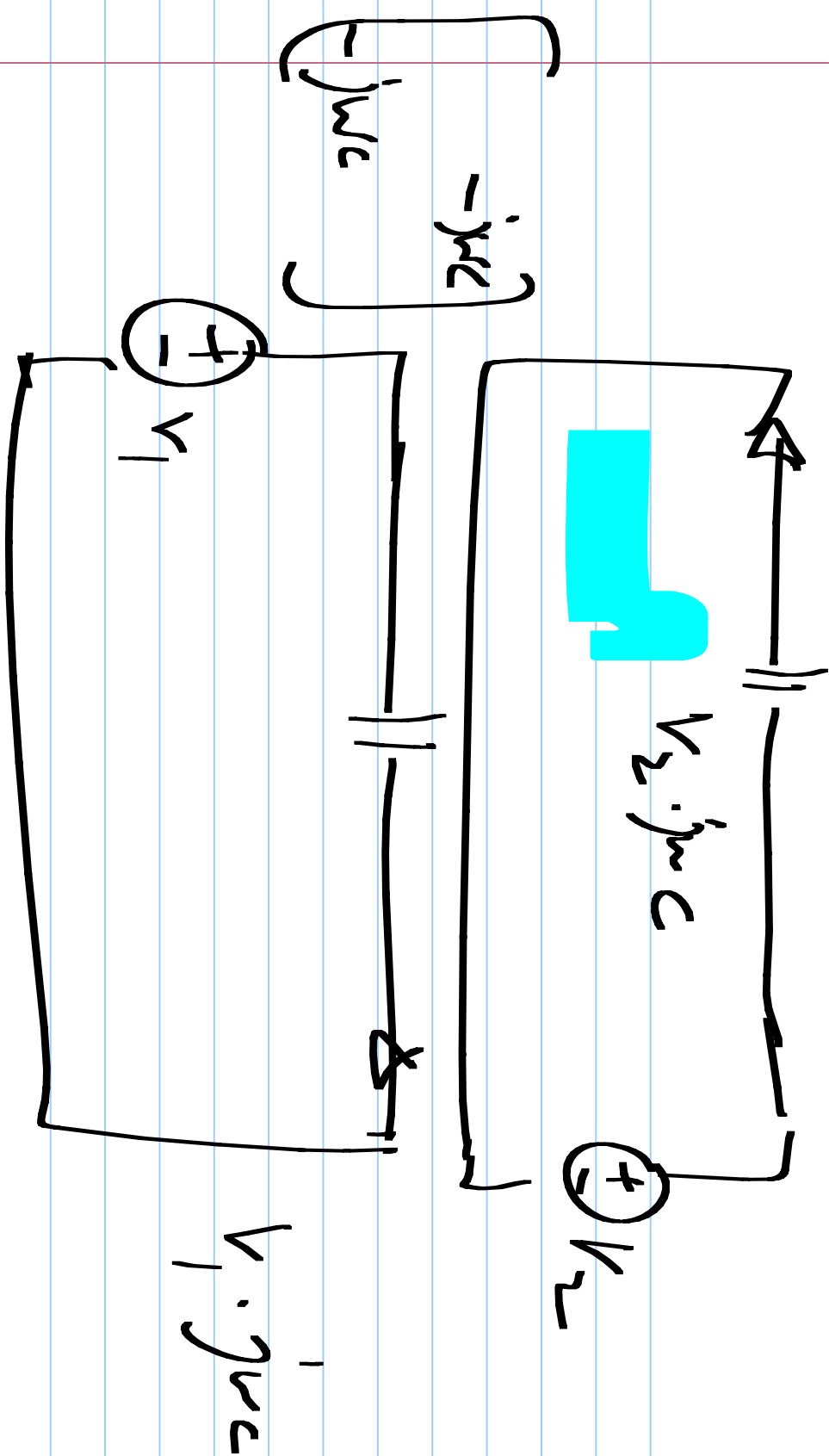
$$v_1 = V_{p1} \cos(\omega t + \phi_1) \quad V_{p1} \angle \phi_1$$

$$v_2 = V_{p2} \cos(\omega t + \phi_2) \quad V_{p2} \angle \phi_2$$

$$\vec{I} = \boxed{y_{11} \cdot V_{p1} \angle \phi_1 + y_{12} V_{p2} \angle \phi_2}$$

\vec{I}_2

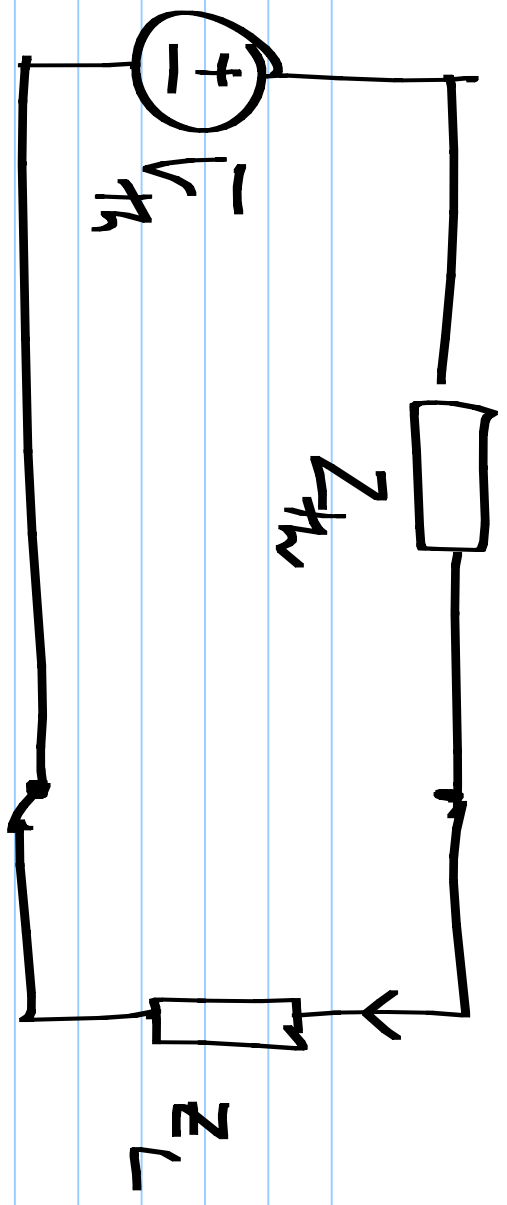
$$i_1(t) = \operatorname{Re} \left[\vec{I}_1 \exp(j\omega t) \right] = |\vec{I}_1| \cdot \cos(\omega t + \phi_{I_1})$$

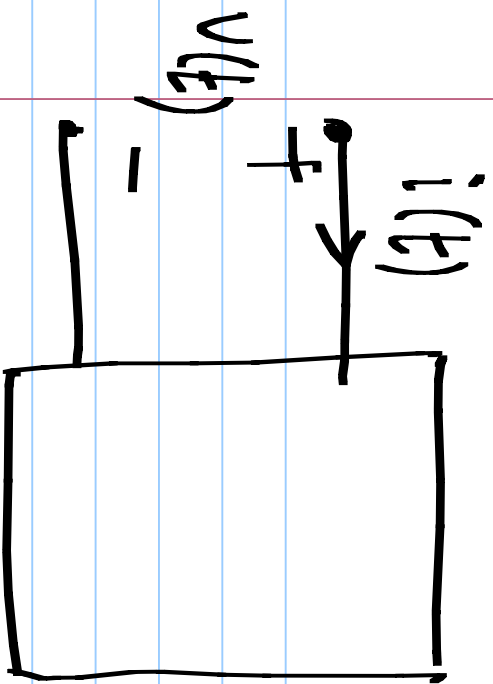


$$V_1 \cdot j\omega c$$

$$V_2$$

$$V_2 \cdot j\omega c$$



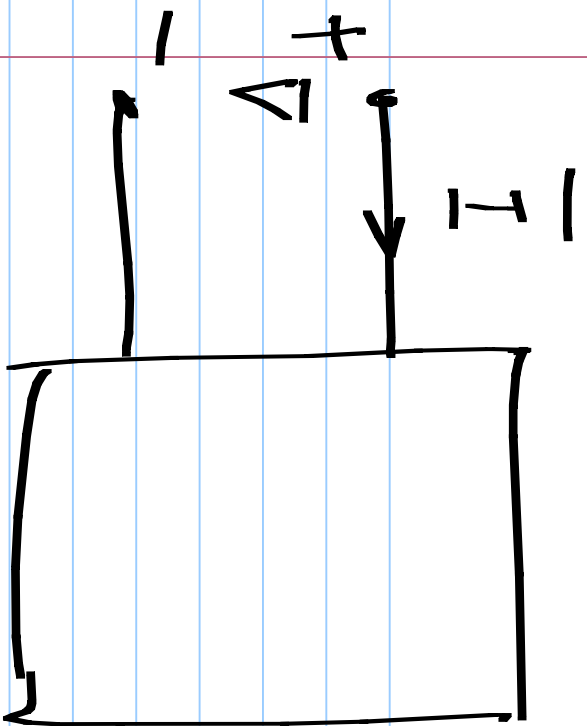


$$p(t) = V(t) \cdot i(t) \\ = \frac{2\pi}{\omega}$$

$V(t), i(t)$ are periodic period T

$$p(t) = \frac{V_p^2 \cos^2 \omega t}{R}$$

$$\frac{1}{T} \int_{-T/2}^{T/2} p(t) dt = \underline{P_{av}}$$



$$v(t) = |V| \cdot \cos(\omega t + \phi_V)$$

$$i(t) = |I| \cdot \cos(\omega t + \phi_I)$$

$$\frac{1}{T} \int_{-T/2}^{T/2} v(t) i(t) dt$$