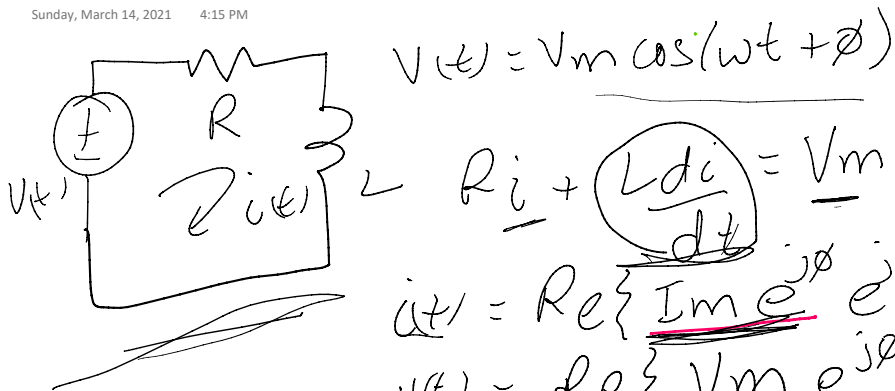


The Complex Forcing Function

Sunday, March 14, 2021 4:15 PM



$$i(t) = \text{Re}\{ \underline{I_m} e^{j\phi} e^{j\omega t} \}$$

$$V(t) = \text{Re}\{ \underline{V_m} e^{j\phi} e^{j\omega t} \}$$

$$\cancel{R \underline{I} e^{j\phi t}} + L j\omega \cancel{\underline{I} e^{j\phi t}} = \cancel{\text{Re}\{ \underline{V} e^{j\phi t} \}}$$

$$R \underline{I} + j\omega L \underline{I} = \underline{V} \quad (\text{Algebraic Eq.})$$

$$\Rightarrow \begin{matrix} \text{time} \\ \uparrow \\ \begin{matrix} i(t) & \longleftrightarrow & \underline{I} \\ V(t) & \longleftrightarrow & \underline{V} \\ d/dt & \longleftrightarrow & j\omega \\ \int dt & \longleftrightarrow & 1/j\omega \end{matrix} \end{matrix} \quad \Rightarrow \quad \underline{I} = \frac{\underline{V}}{R + j\omega L}$$

Phasor