* Steady state Analysis $(t >>> 0) \rightarrow$ FILTER

Example: $v_s(t)$ periodik, $\boxed{v_s(t) = A \sin \omega t}$

$\omega = 2\pi f$ rad/sec

↳ "s" $\simeq j\omega$, $j = \sqrt{-1}$

$$G(s) \longrightarrow G(j\omega) = \frac{1}{LC(j\omega)^2 + RCj\omega + 1}$$

$$= \left[\frac{1}{(1 - \omega^2 LC) + j\omega RC} \right]$$

$$|G(j\omega)| = \frac{1}{\sqrt{(1-\omega^2 LC)^2 + (\omega RC)^2}}$$

$$= \underbrace{|G(j\omega)|}_{\text{gain}} \underbrace{\angle \phi}_{\text{phase}}$$

$$\phi = -\tan^{-1} \frac{\omega RC}{1 - \omega^2 LC}$$

$$\boxed{v_c(t) = |G(j\omega)| \cdot A \sin(\omega t + \phi)}$$