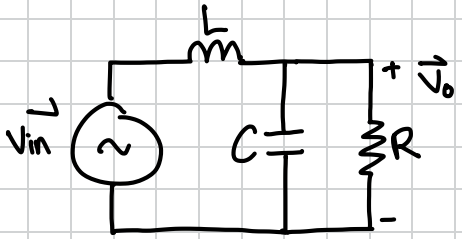
# IMPEDANCE DIVIDER




$$\vec{V}_o = \frac{Z_R \| Z_C}{Z_L + Z_R \| Z_C}\vec{V}_{in} = \frac{\frac{Z_R Z_C}{Z_R + Z_C}}{Z_L + \frac{Z_R Z_C}{Z_R + Z_C}}\vec{V}_{in}$$

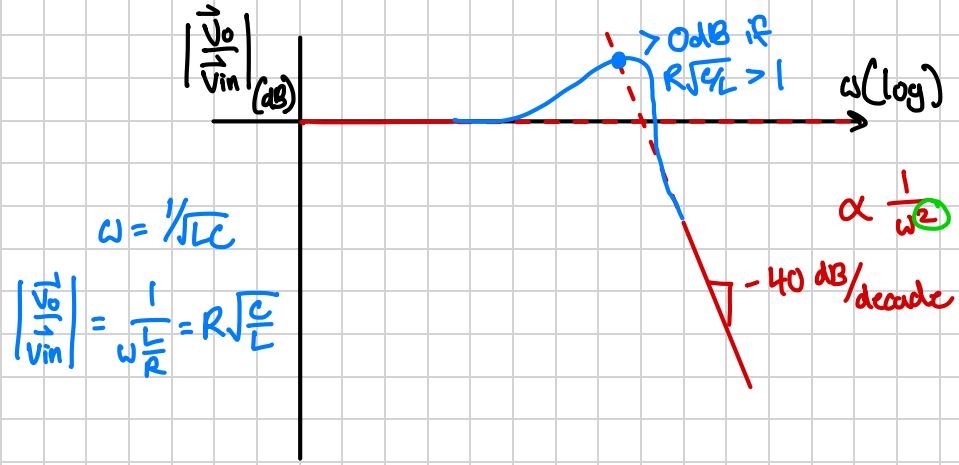
$$\vec{V}_o = \frac{\frac{R/j\omega C}{R + 1/j\omega C}}{j\omega L + \frac{R/j\omega C}{R + 1/j\omega C}}\vec{V}_{in} = \frac{R/j\omega C}{R/j\omega C + j\omega LR + \frac{L}{C}}\vec{V}_{in}$$

$$\vec{V}_o = \frac{R}{(R - \omega^2 LCR) + j\omega L}\vec{V}_{in}$$

$$\frac{\vec{V}_o}{\vec{V}_{in}} = \frac{1}{(1 - \omega^2 LC) + j\omega\frac{L}{R}}$$

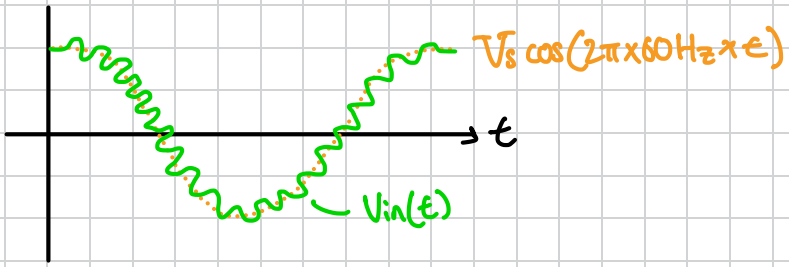
$$\left|\frac{\vec{V}_o}{\vec{V}_{in}}\right| = \frac{1}{\sqrt{(1 - \omega^2 LC)^2 + (\omega\frac{L}{R})^2}}$$

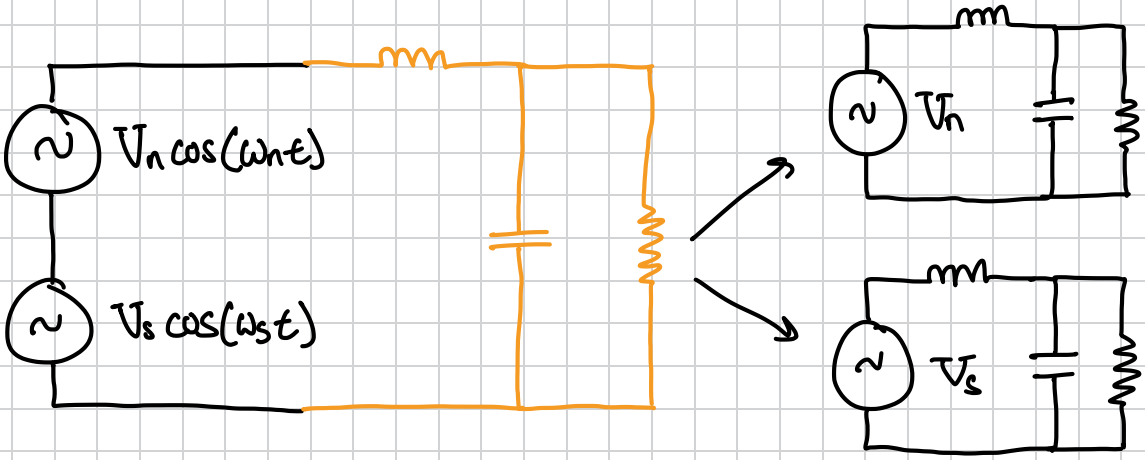
$$\angle\frac{\vec{V}_o}{\vec{V}_{in}} = \tan^{-1}\left(\frac{0}{1}\right) - \tan^{-1}\left(\frac{\omega L/R}{1 - \omega^2 LC}\right)$$



# SUPERPOSITION

$$V_{in}(t) = V_s \cos(2\pi \times 60Hz \times t) + V_n \cos(2\pi \times 6000Hz \times t)$$




Place $1/\sqrt{LC}$ between 60Hz & 6000Hz

# LAB CIRCUIT