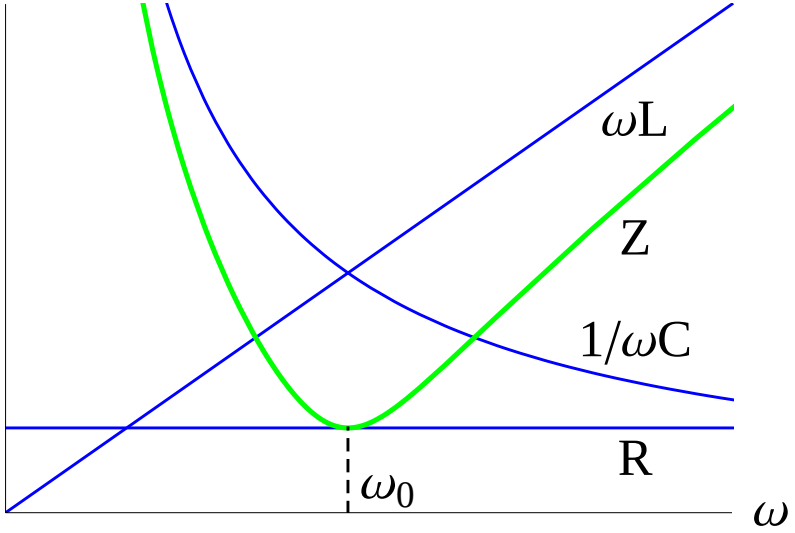
Impedances: RLC in Series (1)

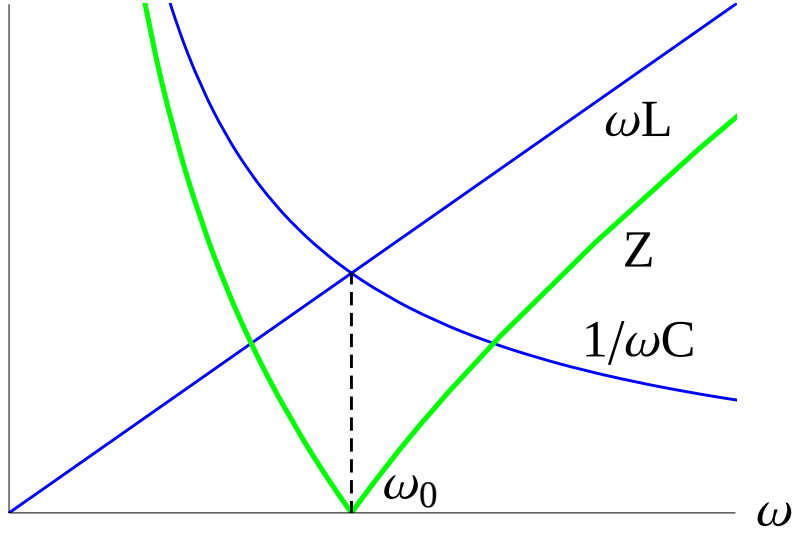
$$Z = \sqrt{R^2 + \left(\omega L - \frac{1}{\omega C}\right)^2}$$

resonance at $\omega_0 = \frac{1}{\sqrt{LC}}$

limit $R \to 0$

$$Z = \left|\omega L - \frac{1}{\omega C}\right|$$

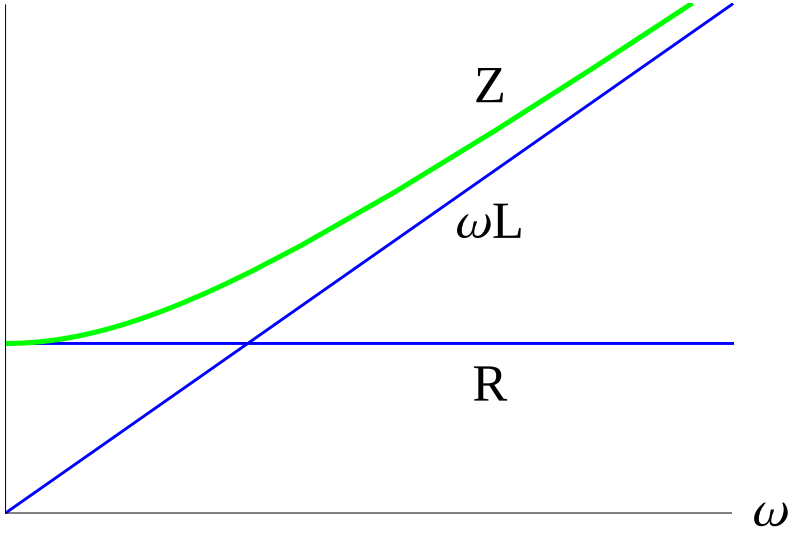




Impedances: RLC in Series (2)

limit $C \to \infty$

$$Z = \sqrt{R^2 + (\omega L)^2}$$



limit $L \to 0$

$$Z = \sqrt{R^2 + \frac{1}{(\omega C)^2}}$$