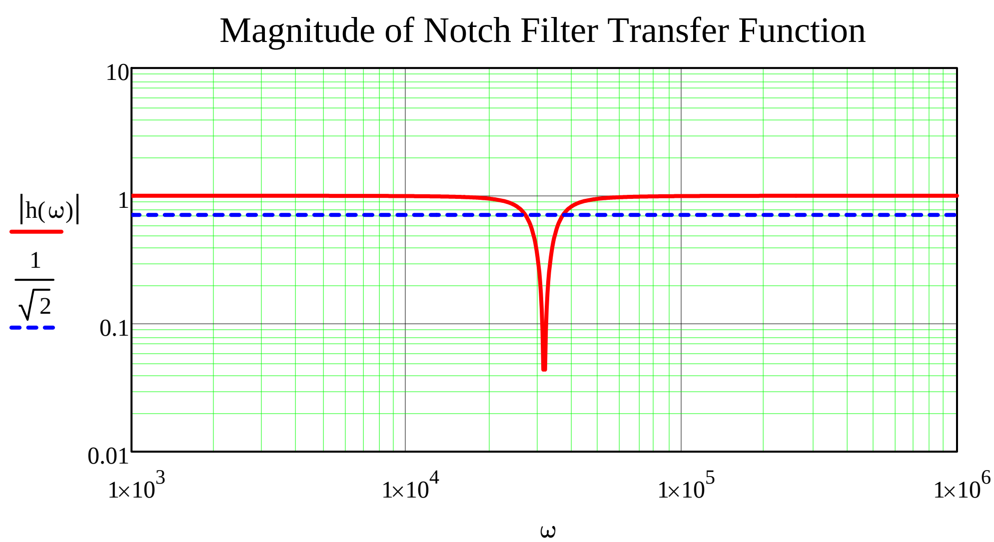
Notch filter transfer function

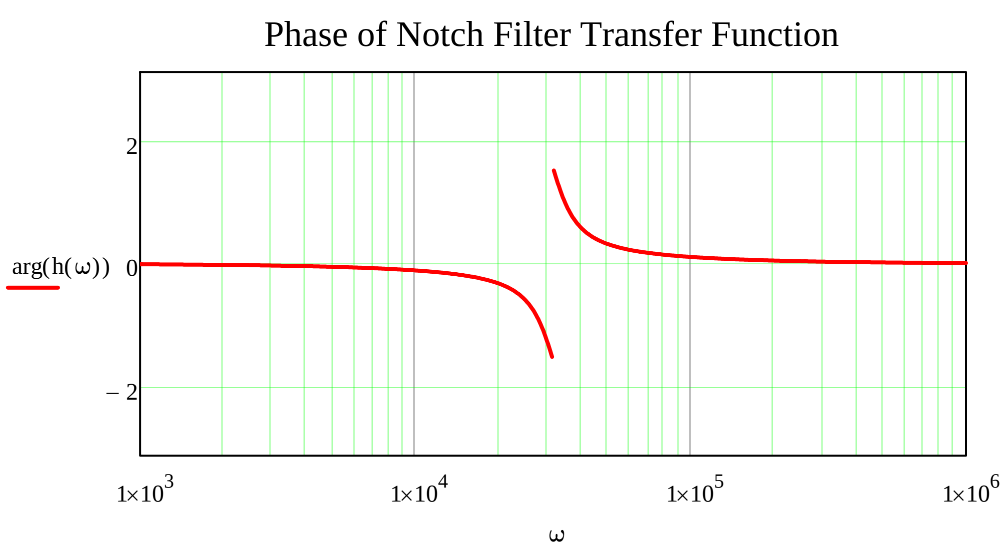
$R := 10 \qquad L := 0.001 \qquad C := 1\cdot 10^{-6}$

$\omega_0 := \frac{1}{\sqrt{L\cdot C}} = 3.162\times 10^{4} \qquad \tau := \frac{L}{R} = 1\times 10^{-4} \qquad Q := \omega_0\cdot\tau = 3.162$

$$h(\omega) := \frac{1-\left(\frac{\omega}{\omega_0}\right)^2}{\left[1-\left(\frac{\omega}{\omega_0}\right)^2\right]+i\cdot\frac{\omega}{\omega_0}\cdot\frac{1}{Q}}$$

Complex ratio of output voltage to input voltage





$Q = 3.162$ Prediction for the quality factor Q

$$f(x) := |h(x)| - \frac{1}{\sqrt{2}}$$ Numerical calculation of Q

$$\omega_1 := \mathrm{root}\left(f(x), x, 0, \omega_0\right) = 2.702 \times 10^4$$

$$\omega_2 := \mathrm{root}\left(f(x), x, \omega_0, 4\omega_0\right) = 3.702 \times 10^4$$

$$\frac{\omega_0}{\omega_2 - \omega_1} = 3.162$$ Definition of the Q factor