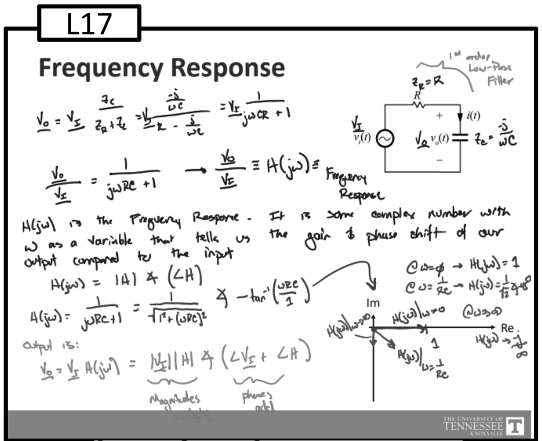
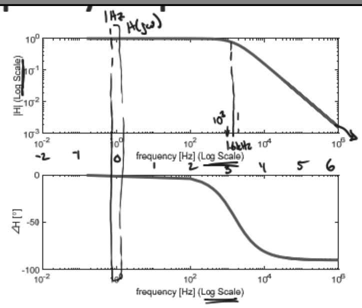
Frequency Response





Bode Plots

dB Scale

Decibels

$$\| G \|_{\mathrm{dB}} = 20 \log_{10}\left(\| G \|\right)$$

Decibels of quantities having units (impedance example): normalize before taking log

$$\| Z \|_{\mathrm{dB}} = 20 \log_{10}\left(\frac{\| Z \|}{R_{base}}\right)$$

Table 8.1. Expressing magnitudes in decibels

Actual magnitude	*Magnitude in dB*
1/2	– 6dB
1	0 dB
2	6 dB
5 = 10/2	20 dB – 6 dB = 14 dB
10	20dB
$1000 = 10^3$	3 · 20dB = 60 dB

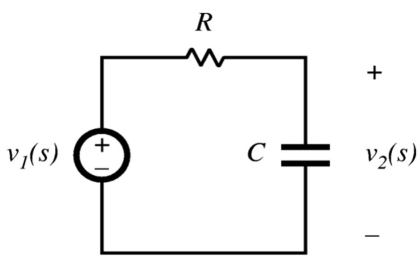
5Ω is equivalent to 14dB with respect to a base impedance of R_{base} = 1Ω, also known as 14dBΩ.

60dBμA is a current 60dB greater than a base current of 1μA, or 1mA.

Logarithm Review

Plotting on Logarithmic Axes

Single Pole Response



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