🧠 3. Practice Problems and Tasks

Problem 1

Given:

$h(t) = e^{-2t}u(t)$

Find the frequency response $H(j\omega)$.

Hint:

Use the Fourier Transform of $e^{-at}u(t)$:

$\frac{1}{a+j\omega}$

Problem 2

For the system defined by:

$H(s) = \frac{10}{s+10}$

1. Plot the Bode plot using Octave.
2. Identify cutoff frequency and describe the filter type.

Problem 3 (Octave Task)

Use Octave to compute and plot the frequency response of the following transfer function:

$$H(s) = \frac{100}{s^2 + 10s + 100}$$

1. Plot both the magnitude and phase.
2. Determine the -3dB cutoff frequency.