The transfer function of a LTIC system is given by

\[ H(s) = \frac{s + 100}{s^2 + 2s + 100} \]

1. Plot the magnitude and phase of the frequency response of the system using MATLAB for frequency range between 1 and 1000 rad/s.

2. Verify this plot by calculating the magnitude and phase of the frequency response at \( \omega = 1 \), 10 and 1000 rad/s by hand.

3. Find the steady-state response to the following input

\[ x(t) = 4 \cos(t) + 2 \cos(10t + 0.5) - \cos(1000t - 0.4) \]

4. Plot the input and the steady-state response obtained in part 3 using MATLAB.