1. \( v_i(t) = -2 + 2 \cdot u(t) \ V \)

a. First, find a symbolic expression for \( V_o(s) \) in terms of not more than \( R_1, R_2, L, \) and \( C \). (Use numerical values for initial conditions and \( V_i(s) \).)

Then use the initial value theorem to find \( v_o(t=0+) \).

Note: The \(-2V\) in \( v_i(t) \) is present for all time, (including \( t < 0 \)).

b. Choose numerical values for \( L \) and \( C \) \( \omega \) make \( v_i(t) = v_m e^{-\alpha t} \cos(\beta t + \phi) \) where \( v_m \) and \( \phi \) are constants, \( \alpha = 1k \) /s, and \( \beta = 3k \) rad/s.

2. Given \( \omega = 400 \) rad/s and \( \frac{N_2}{N_1} = 1/3 \), find a numerical value for \( L \) and \( R \) to make \( z_L = 1 + j 1 \) \( \Omega \) where \( z_L \) is the equivalent impedance of the entire circuit.
Find a numerical expression for the current $I_{BA}$ in the load. Use $z_L = 1 + j \Omega$. 