**Problem 1**

For the circuit of figure 1–top, do the following:

1) Find the transfer function

\[ \frac{V_o(s)}{V_i(s)} \]  

2) Find an expression of \( v_o(t) \) knowing that the input is a unit step

3) Determine an expression for \( v_o(t) \) (voltage across the 1H inductor as shown in the figure) as a function of time.

4) Use Matlab to plot \( v_o(t) \) as a function of time.

5) Use the Matlab function step to plot the output and compare with the previous question.

**Problem 2**

For the circuit of figure 1–bottom, do the following:

1) Find the transfer function

\[ \frac{I_o(s)}{I_s(s)} \]  

2) Find an expression of \( i_o(t) \) knowing that the input is a unit step

3) Use Matlab to plot \( i_o(t) \) as a function of time.

4) Use the Matlab function step to plot the output and compare with the previous question.