For the circuit shown $C=1\, \text{F}$, $R=1\, \Omega$, and $L=1\, \text{H}$:

a) Write the matrix state equation.

b) Utilizing the result from (a), use numerical method to find approximate value for the current in the inductor at $t=0.002\, \text{s}$. Use $\Delta t=0.001\, \text{s}$ and assume $i_L(0)=0.1\, \text{A}$, $v_c(0)=10\, \text{V}$, and $v_s(0)=20\, \text{V}$. 

Good Luck,
Dr. Ali Muqaibel