Problem 1
For the circuit below, find the following using voltage and current division (not node or mesh analysis) for

\[ v_S = 20\cos(100t) \]
\[ C_1 = 100 \mu F \]
\[ C_2 = 1 \text{ mF} \]
\[ R_1 = 50 \Omega \]
\[ R_2 = 10 \Omega \]

Find: The voltage across and current through each element.
All answers should be expressed in the time domain.

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All answers should be expressed in the time domain.

Problem 2

Problem 3

Given:
\[ R_1 = 4 \Omega \]
\[ R_2 = 2 \Omega \]
\[ L = 40 \text{ mH} \]
\[ C_1 = 5 \text{ mF} \]
\[ C_2 = 1 \text{ mF} \]
\[ i_{s1}(t) = 1\cos(100t) \text{ A} \]
\[ i_{s2}(t) = 0.5\cos(100t - \frac{\pi}{2}) \text{ A} \]

Find: The four node voltages
The three mesh currents
The voltage across C1
The current through L
All answers should be expressed in the time domain.

Given:
\[ R_1 = 5 \Omega, R_2 = 10 \Omega \]
\[ L_1 = 0.1 \text{ H}, L_2 = 50 \text{ mH} \]
\[ C_1 = 1 \text{ mF}, C_2 = 2 \text{ mF} \]
\[ i_{s1} = 1 \text{ A} \]
\[ i_{s2} = 0.5\sin(100t) \text{ A} \]

Notice the frequencies
Find:
The voltage across C2
The current through L1
All answers should be expressed in the time domain.