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

1. \( v_s(t) = 10 \sin(t) \)
2. \( v_s(t) = 10 \cos(1000t) \)
   a) What is the current through the source?
   b) What is the current, \( i \)?
   c) What is the voltage drop, \( V_o \)?

Notice which frequencies cause \( Z_L \) and \( Z_C \) to be large.

Problem 2
Given:
\( R_1 = 20 \ \Omega \)
\( R_2 = 25 \ \Omega \)
\( L = 5 \ \text{H} \)
\( C = 0.2 \ \text{F} \)
\( v_s = 5\cos(2\pi t) \ \text{V} \)
Find: The two node voltages (neither is known)
   The three mesh currents
   The voltage across \( C \)
   The current through \( V_S \)

Problem 3
Given:
\( R_1 = 10 \ \Omega \)
\( L = 15 \ \text{mH} \)
\( C = 100 \ \mu\text{F} \)
\( v_{s1} = 20\cos(1000t) \ \text{V} \)
\( v_{s2} = 10\sin(500t - \frac{\pi}{2}) \ \text{V} \)
Notice the frequencies
Find: The unk. node voltage
   The two mesh currents
   The voltage across \( C \)
   The current through \( L \)