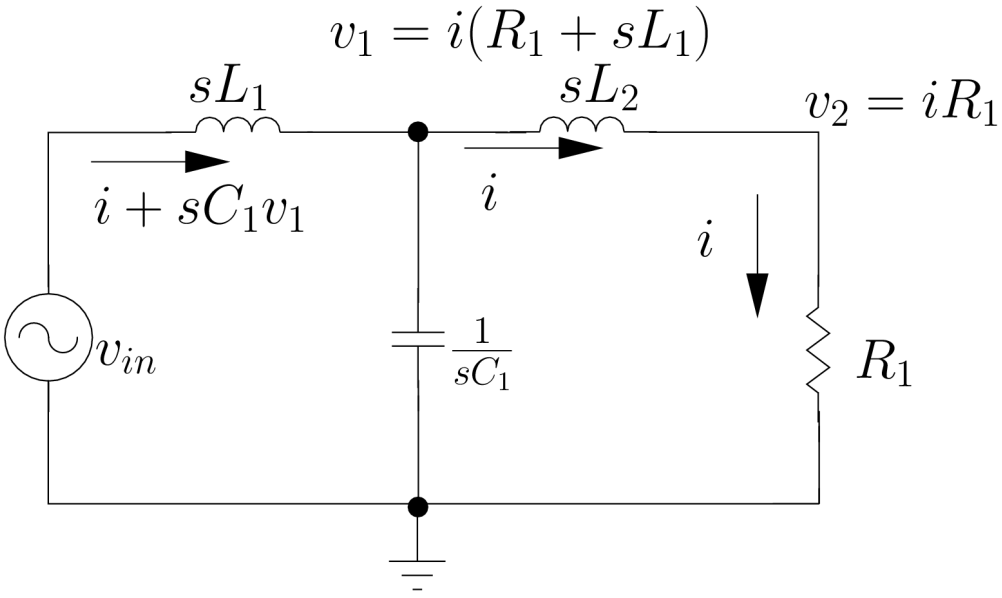
Circuit Analysis:



let us take the above circuit into consideration, with three nodes namely:

- vin
- v_1
- v_2

and **i** is the current passing through them.

1. Considering node v_2 :

$$v_2 = iR_1 \quad \text{(Equation 1)}$$

2. Now at node v_1 :

$$v_1 = v_2 + isL_2 \quad \text{(Equation 2)}$$

$$v_1 = i(R_1 + sL_2) \quad \text{(Equation 3)}$$

3. To determine vin :

$$vin = sL_1(i + \frac{v_1}{\frac{1}{sC_1}}) + v_1 \quad \text{(Equation 4)}$$

$$vin = sL_1(i + i(R_1 + sL_2)sC_1) + i(R_1 + sL_2) \quad \text{(Equation 5)}$$

$$vin = i(sL_1(1 + sC_1R_1 + s^2C_1L_2) + R_1 + sL_2) \quad \text{(Equation 6)}$$

4. The current **i** can be obtained from the **equation 6** :

$$i = \frac{vin}{(sL_1 + s^2C_1R_1L_1 + s^3C_1L_1L_2 + R_1 + sL_2)} \quad \text{(Equation 7)}$$

5. v_1 **and** v_2 **in terms of** vin **:**

$$v_2 = \frac{vinR_1}{(sL_1 + s^2C_1R_1L_1 + s^3C_1L_1L_2 + R_1 + sL_2)} \quad \text{(Equation 8)}$$

$$v_1 = \frac{vin(R_1 + sL_2)}{(sL_1 + s^2C_1R_1L_1 + s^3C_1L_1L_2 + R_1 + sL_2)} \quad \text{(Equation 9)}$$