

1. (1)  $C_1, C_2,$

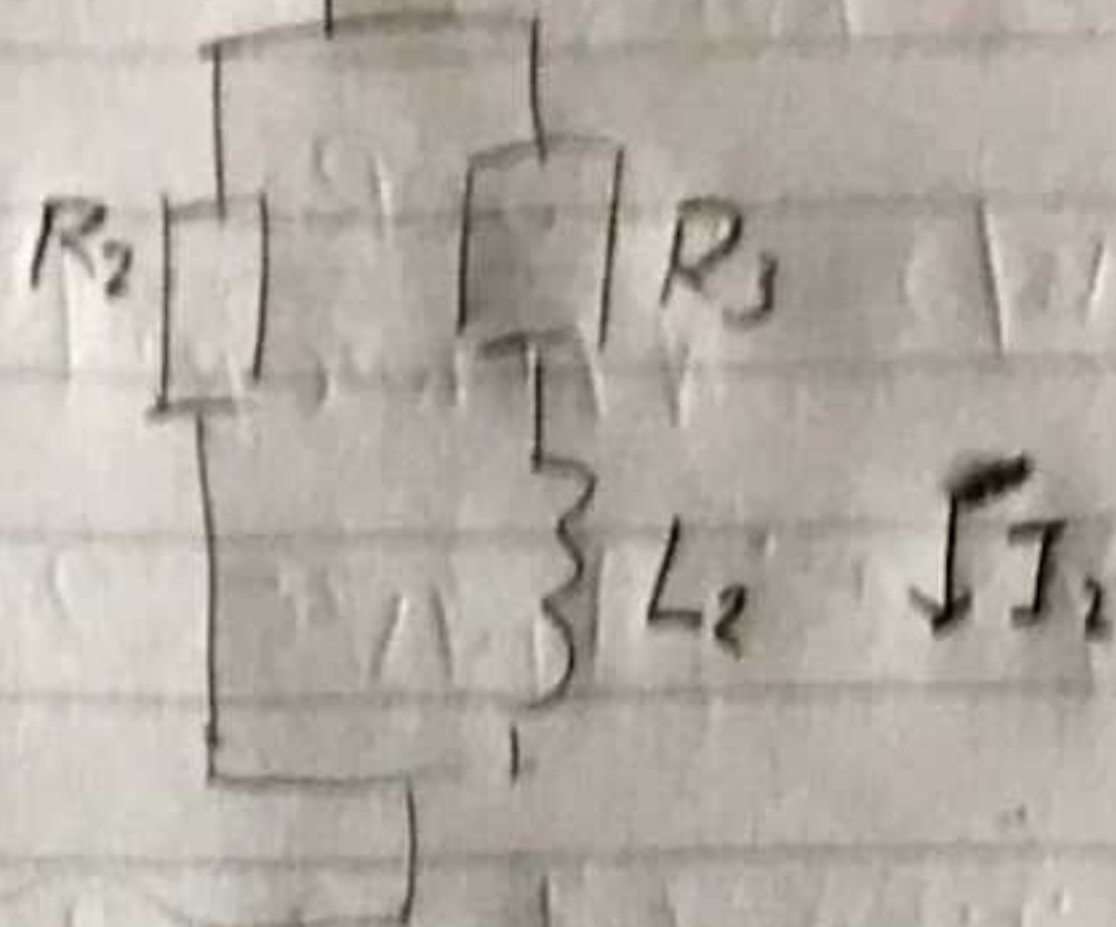
(2)  $L_1, L_2,$

$$(3) \quad R_1 + \frac{1}{\frac{1}{R_2} + \frac{1}{R_3}}$$

$$= R_1 + \frac{R_2 R_3}{R_2 + R_3}$$

$$= \frac{R_1 R_2 + R_3 R_1 + R_2 R_3}{R_2 + R_3}$$

$I_1 - I_2$



$$(4) \quad \begin{cases} V_0 = R_1 I_1 + R_3 I_2 + R_2 (I_1 - I_2) \\ V_0 = R_1 I_1 + R_2 (I_1 - I_2) \\ = (R_1 + R_2) I_1 - R_2 I_2 \end{cases}$$

$$\frac{R_3}{R_2} V_0 = \frac{(R_1 + R_2) R_3}{R_2} I_1 - R_3 I_2$$

$$\frac{R_2 + R_3}{R_2} V_0 = \frac{R_1 R_3 + R_2 R_3 + R_1 R_2}{R_2} I_1$$

$$I_1 = \frac{R_2 + R_3}{R_1 R_2 + R_2 R_3 + R_3 R_1} V_0$$

$$I_2 = \frac{R_2}{R_1 R_2 + R_2 R_3 + R_3 R_1} V_0$$

(5)  $L_1$  と  $L_2$  に蓄えられているエネルギーはそれぞれ

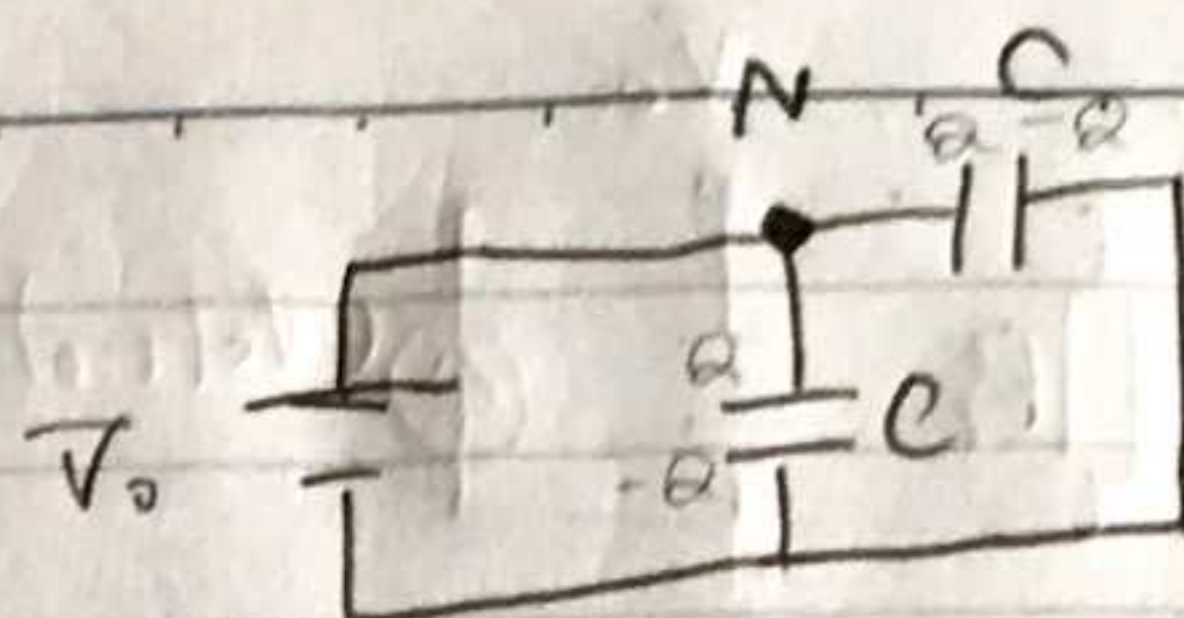
$$\frac{1}{2} L_1 I_1^2 = \frac{1}{2} L_1 \left( \frac{R_2 + R_3}{R_1 R_2 + R_2 R_3 + R_3 R_1} \right)^2 V_0^2$$

$$\frac{1}{2} L_2 I_2^2 = \frac{1}{2} L_2 \left( \frac{R_2}{R_1 R_2 + R_2 R_3 + R_3 R_1} \right)^2 V_0^2$$



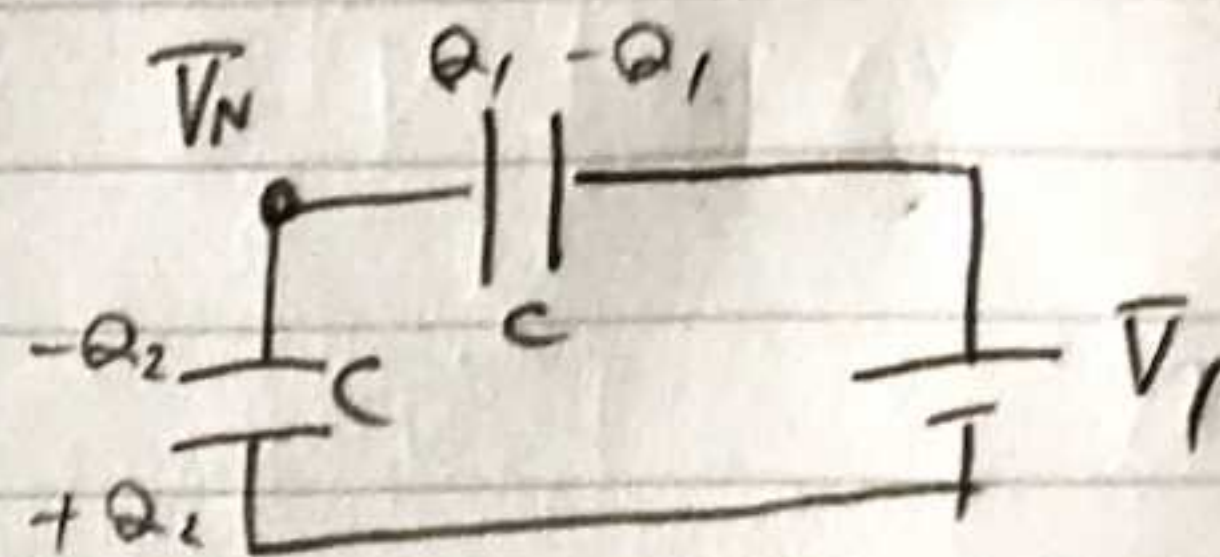
$$2. (1) \frac{Q}{C} = V_0$$

$$\therefore Q = CV_0$$



$$(2) Q_1 - Q_2 = 2Q = 2CV_0$$

$$\frac{Q_1}{C} + \frac{Q_2}{C} = V_0 + V_1$$



$$\therefore Q_1 + Q_2 = CV_1$$

$$\therefore Q_1 = C(V_0 - \frac{V_1}{2})$$

$$Q_2 = C(\frac{V_1}{2} - V_0)$$

$$V_N - V_1 = \frac{Q_1}{C} = V_0 - \frac{V_1}{2}$$

$$\therefore V_N = V_0 + \frac{V_1}{2}$$

3. (1.1)

$$F(s) = \frac{s-2}{s^2+3s+2} = \frac{s-2}{(s+1)(s+2)} = \frac{-3}{s+1} + \frac{4}{s+2}$$

ラプラス変換おして

$$f(t) = -3e^{-t} + 4e^{-2t}$$

$$(1.2) F(s) = \frac{1}{s^2+2s+2} = \frac{1}{(s+1)^2+1} = \frac{1}{(s+1)^2+1^2}$$

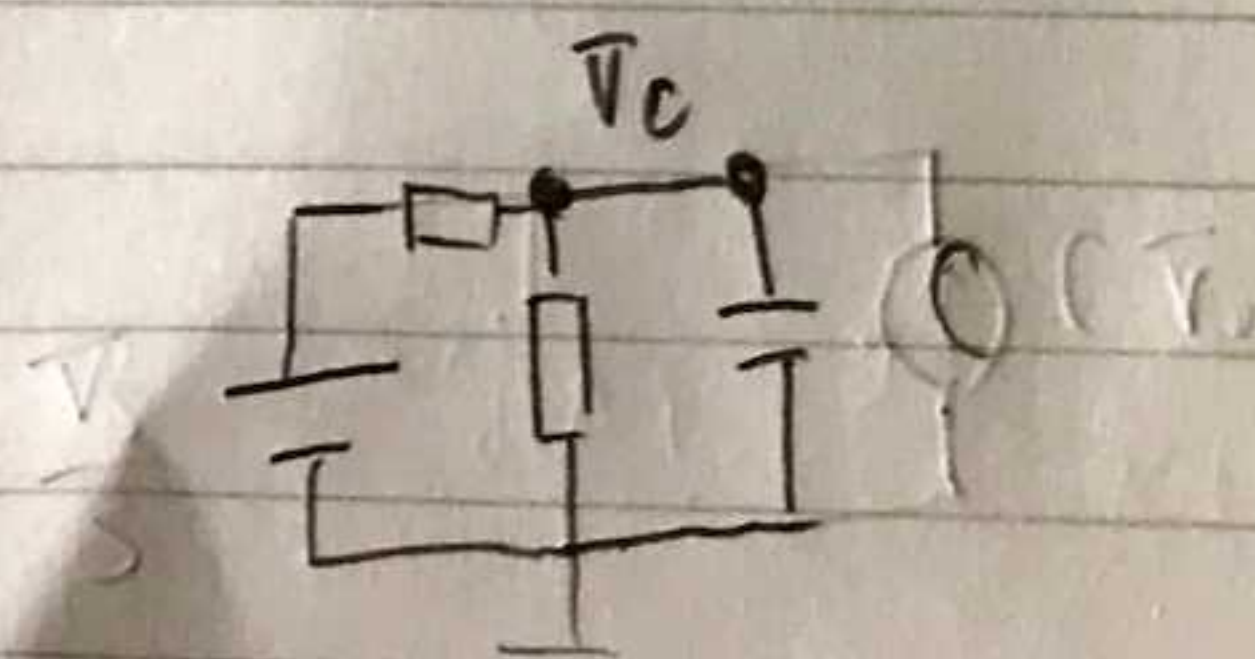
ラプラス変換おして

$$f(t) = e^{-t} \sin t$$

$$(2.1) \frac{V_c}{R_2} + \frac{V_c - \frac{V_0}{s}}{R_1} + sC V_c = 0$$

$$\therefore V_c \left( \frac{1}{R_1} + \frac{1}{R_2} + sC \right) = \frac{V_0}{s}$$

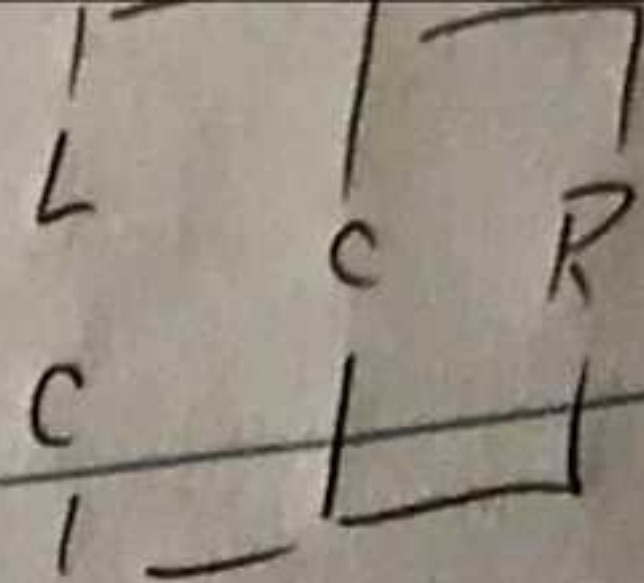
$$\therefore V_c = \frac{V_0}{\left( \frac{1}{R_1} + \frac{1}{R_2} \right) s + s^2 C}$$



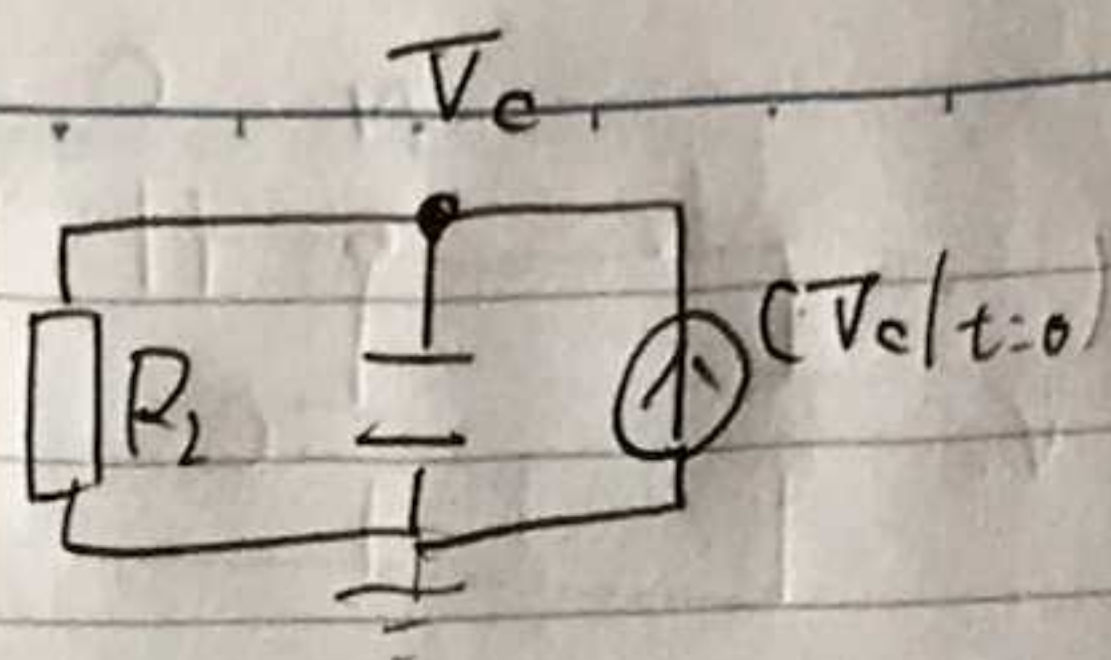


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(2, 2)



4. (1)

$$Z = (j\omega L + \frac{1}{j\omega C}) + j\omega C + \frac{1}{R}$$

(2)

$$Z = \frac{R(j\omega L)(j\omega C) + R + (j\omega C)^2 + j\omega C}{j\omega C R}$$