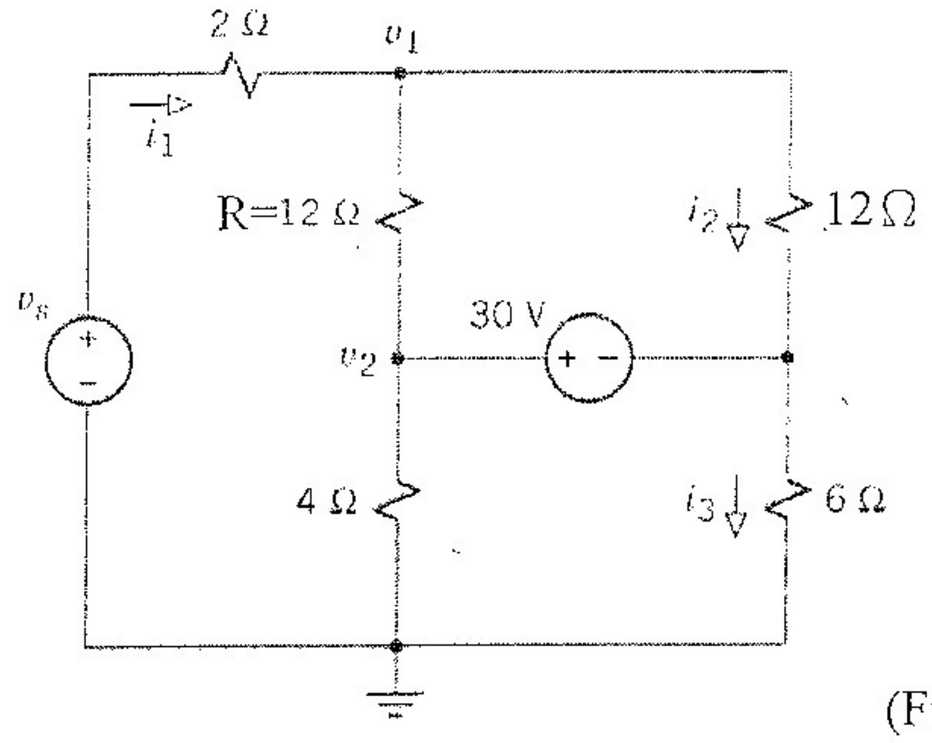
電路學第二次小考: 第四章、第五章

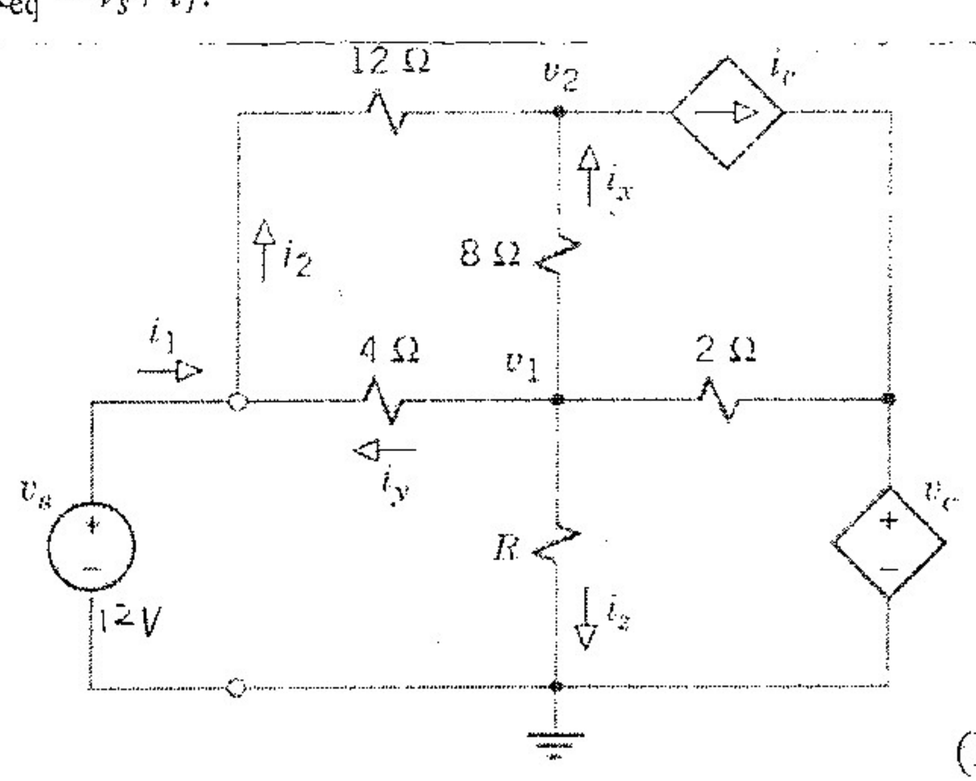
9:10-10:00 am, 10/28/2009

1. (30%) Let v_s = 23V in Fig. 1. Use node or mesh analysis to calculate the power supplied by each source and power consumed by resistor R.



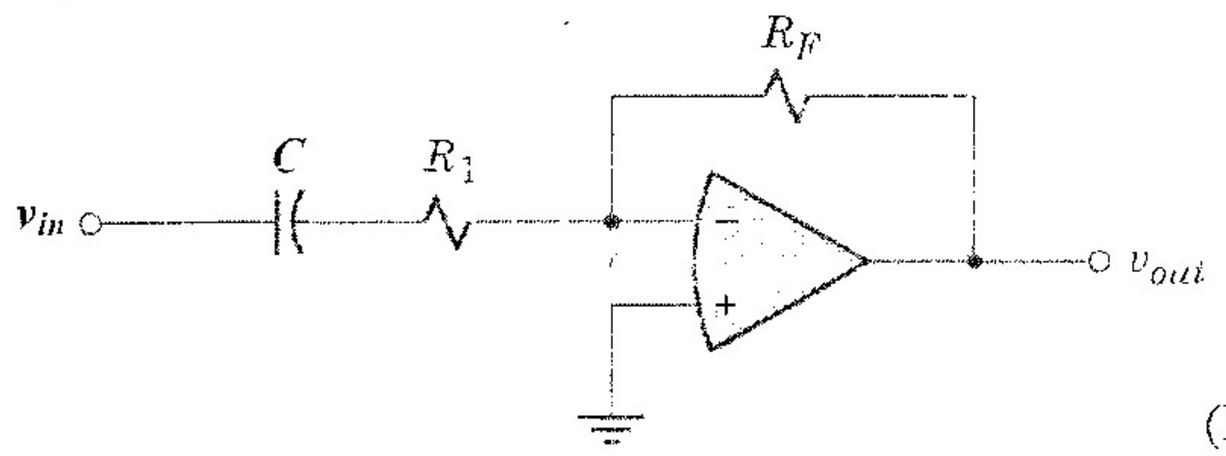
(Fig. 1)

2. (30%) Let the circuit in Fig. 2 have v_s = 12V, $i_c = 2\ i_x$, $v_c = 6\Omega \times i_z$, and R = 3Ω. Use node or mesh analysis to obtain v_1, v_2, i_1, i_2, and the equivalent input resistance $R_{eq} = v_s / i_1$.



(Fig. 2)

3. (10%) Derive the differential equation relating v_{out} to v_{in} for the ideal op-amp circuit in Fig. 3.



(Fig. 3)

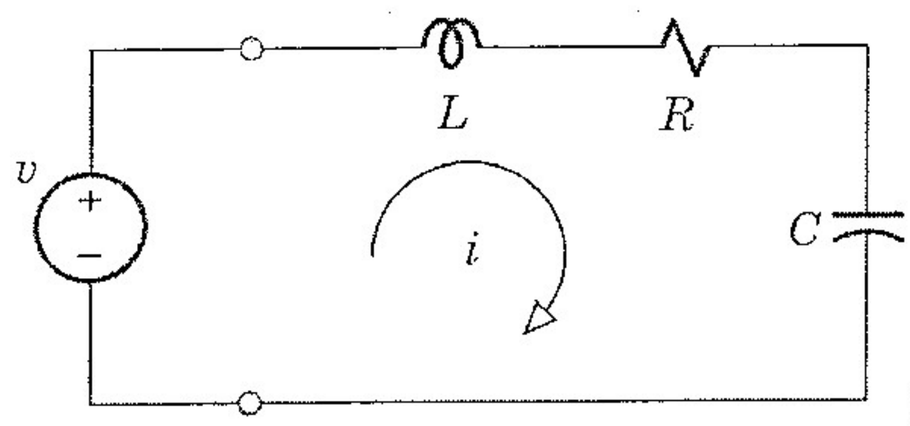
背面尚有試題

4. (30%) Let L = 1H, R = 120Ω, and C = 500μF in Fig. 4.

(a) Find the natural response $i_N(t)$. Is the circuit stable?

(b) Find the forced response $i_F(t)$ if $v = 520 \cos 100t$.

(c) If $i(0) = di(t)/dt \mid_{t=0} = 0$, find the complete solution $i(t)$.



(Fig. 4)