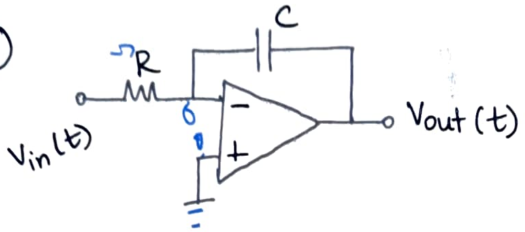
Tutorial - 3

19 August 2024 12:18

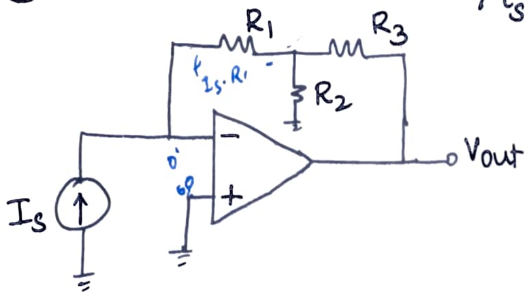
①



Assume an ideal opamp. Derive the expression for $V_{out}(t)$ in terms of $V_{in}(t)$, R and C.

If $V_{in}(t) = A\cos(2\pi f t)$. Calculate V_{out}.

② Determine the ratio V_o/i_s in the opamp circuit below.

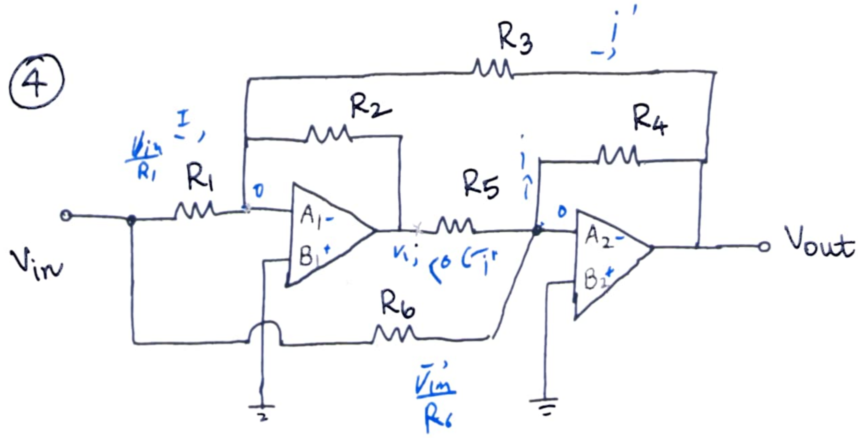


Evaluate the "transresistance" for $R_1 = 20\,k\Omega$, $R_2 = 25\,k\Omega$ and $R_3 = 40\,k\Omega$

③ Realize the following expression using the minimum number of opamps and resistors. V_1 & V_2 are input voltages.

$$V_0 = \frac{(R_3 + R_4)}{R_3(R_1 + R_2)}(R_2 V_1 + R_1 V_2)$$

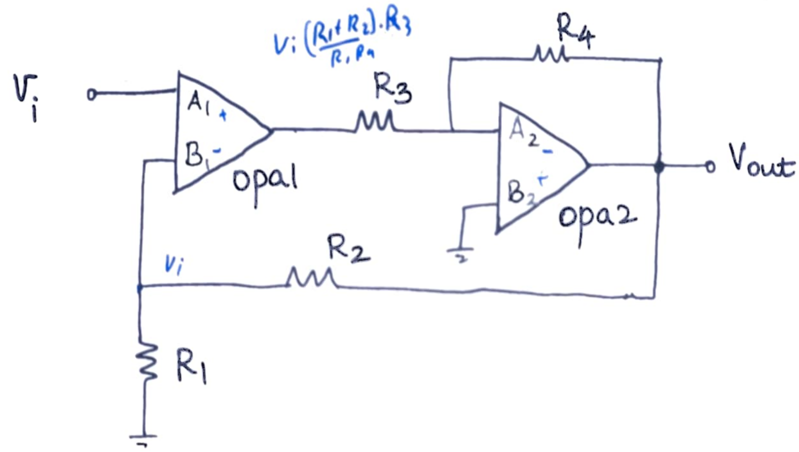
④



(a) Determine the signs of the opamp (where A_1 or B_1 is positive or negative) for negative feedback. Note that when multiple loops are involved, the procedure is to ensure every loop is in negative feedback.

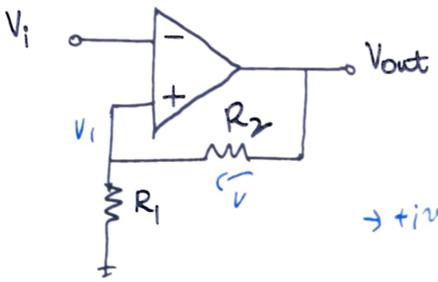
(b) Calculate V_{out}/V_{in}.

(5) Determine the signs of the opamp for negative f/b.



Calculate V_{out}/V_i

(6)



$V_{out} = \frac{V_i \cdot R_2}{R_1} + V_i$

$= V_1 \left(\frac{R_2+R_1}{R_1}\right)$

$= 2.$

→ +ive feedback

Calculate V_{out}, when $R_1 = R_2 = 1k\Omega$ and $V_i = 1V$