

淡江大學八十八學年度碩士班招生考試試題

系別：電機工程學系

科目：電路學

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本試題雙面印製

1. Find $i(t)$ for the circuit shown in Fig. 1 with $v_c(0)=1$. (15%)

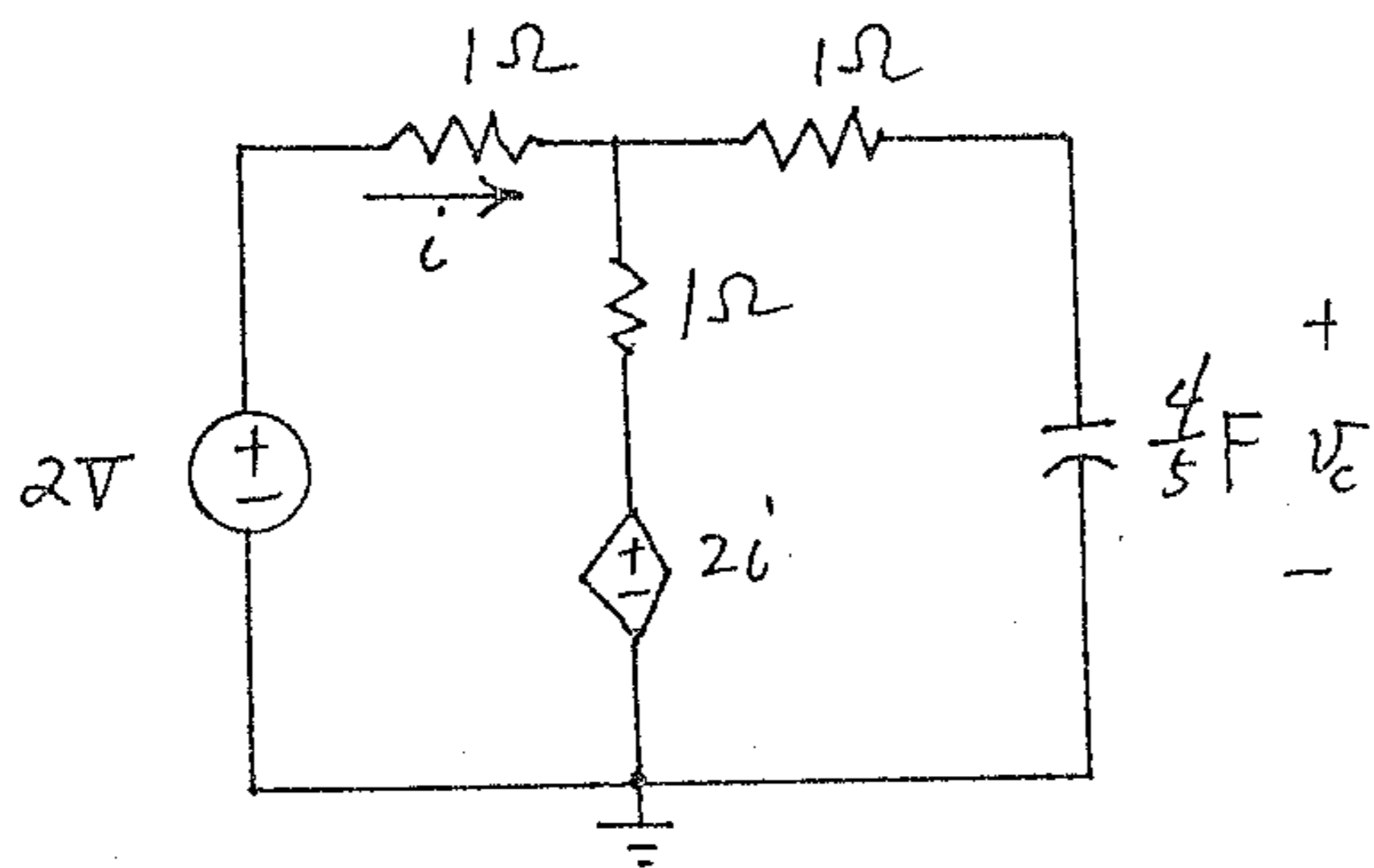


Fig. 1

2. For the circuit shown in Fig. 2:

(a) Find the voltage transfer function V_2/V_1 , where V_1 and V_2 are phasors. (10%)

(b) If $v_1(t)=3 \cos 4t$, find the sinusoidal steady-state expression for $v_2(t)$. (10%)

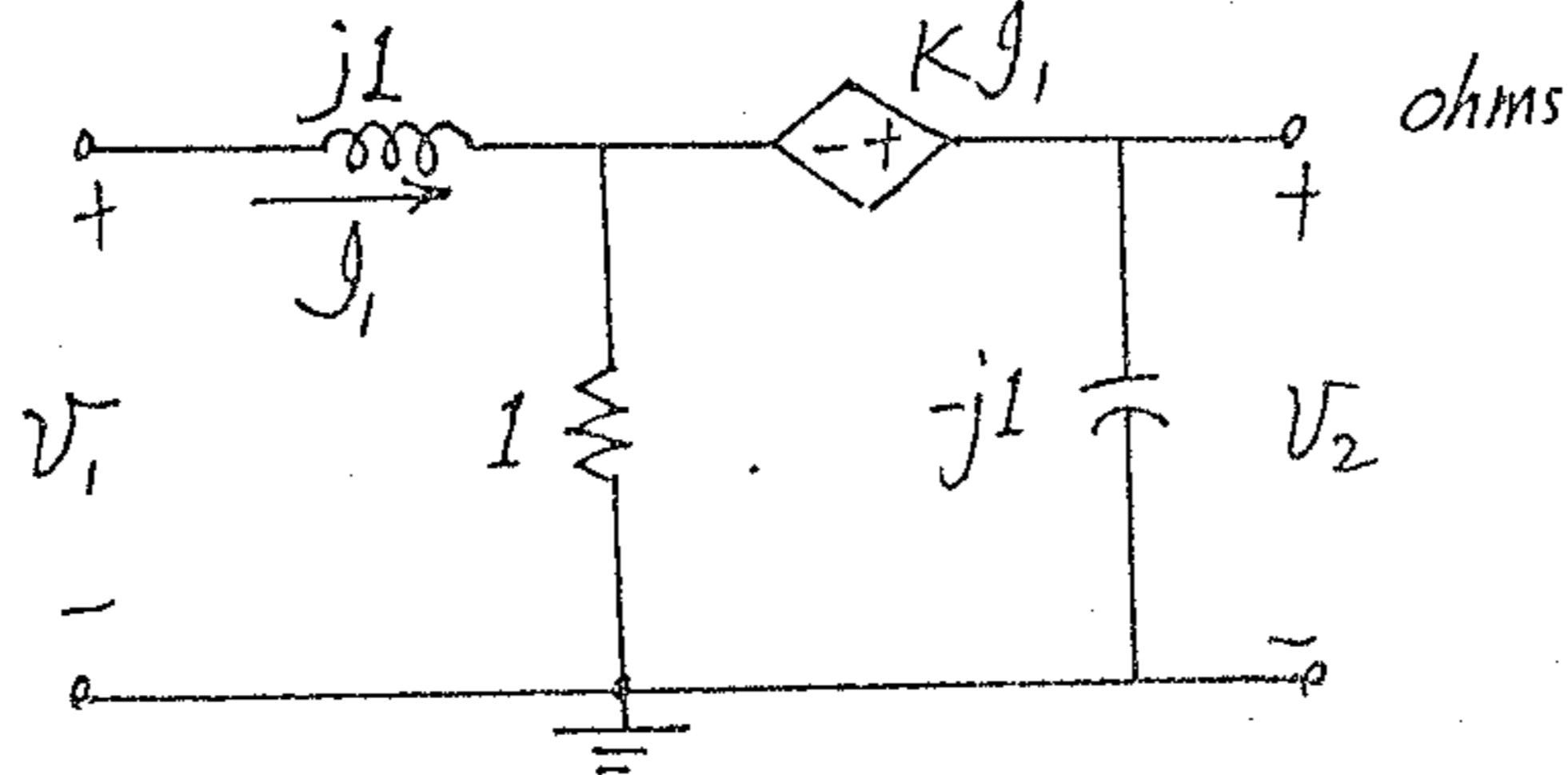


Fig. 2

3. The circuit shown in Fig. 3 is in the steady state with switch S closed. The switch S is opened at $t=0$. Find the currents $i_{L1}(t)$ and $i_{L2}(t)$ and the voltage $v(t)$ for $t \geq 0$ (15%)

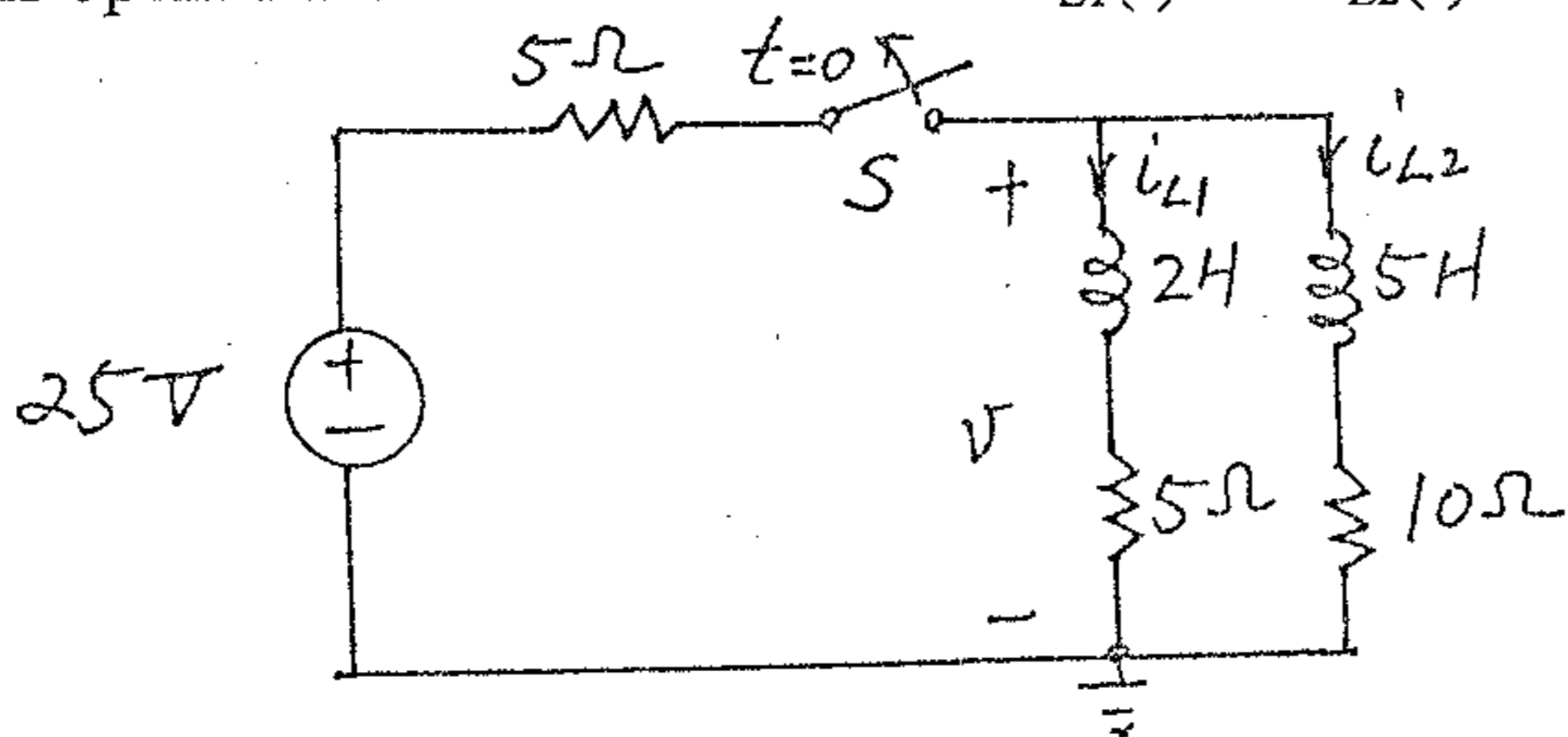


Fig. 3

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4. Write a PSpice input file to analyze the active-RC circuit shown in Fig. 4, where $u(t)$ is a unit-step function and $v_{c1}(0)=v_{c2}(0)=1$. The analysis time is 10 seconds. (15%)

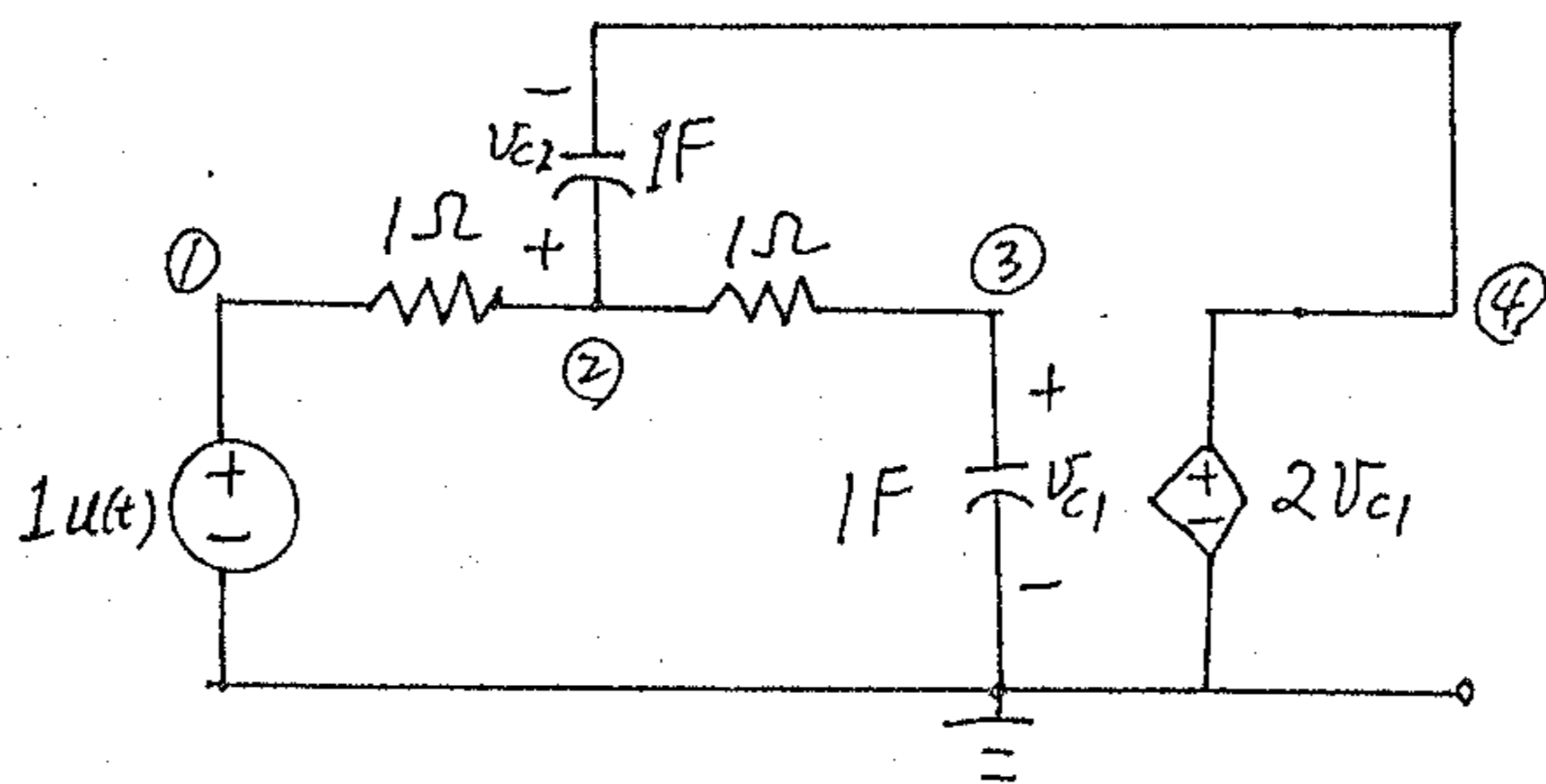


Fig. 4

5. Find the value of the average current in the battery charge circuit shown in Fig. 5. Assume that $R=0.25$ ohm and $v_s(t)=20 \sin 377t$. (20%)

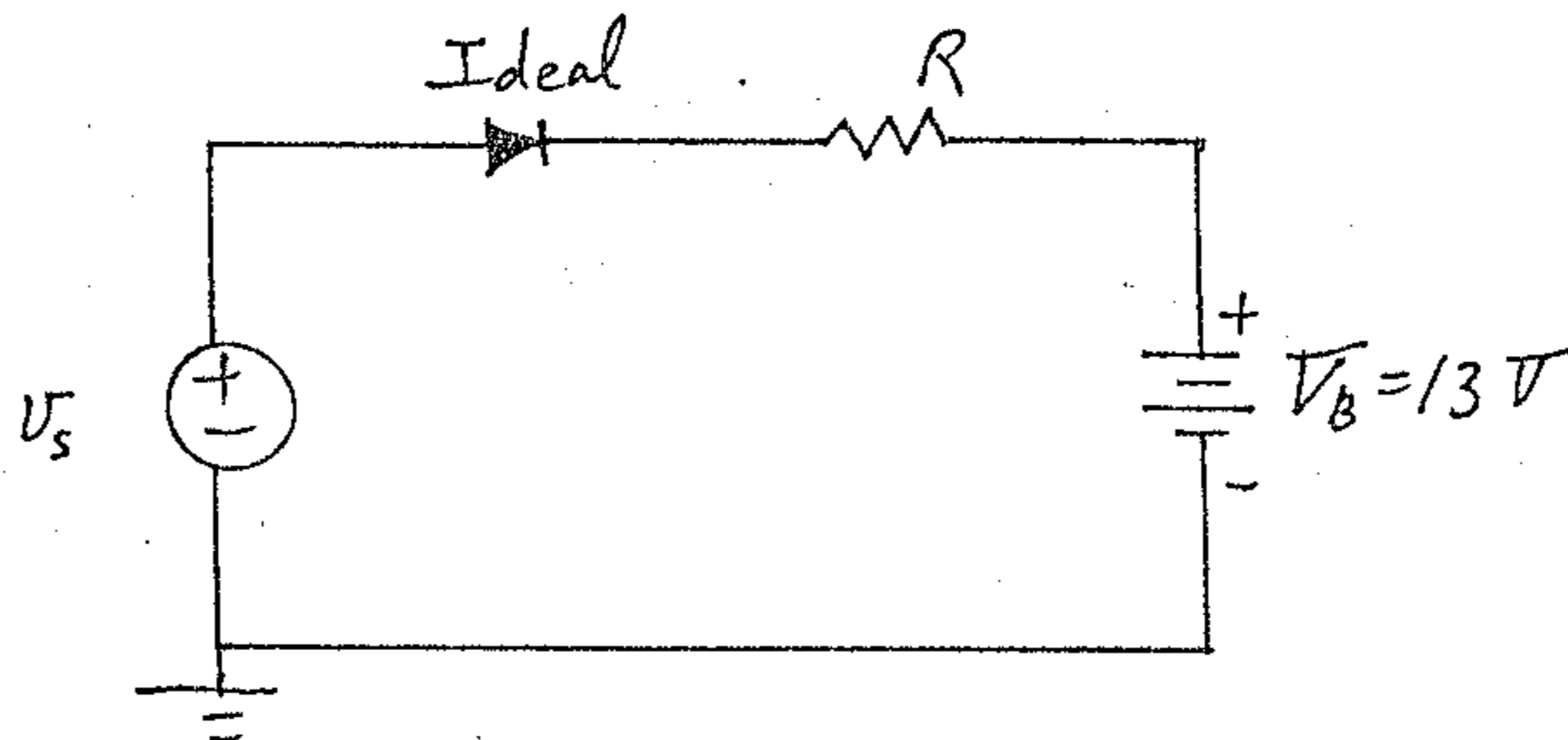


Fig. 5

6. Determine $H(s) = V_3(s)/V(s)$ for the op amp circuit shown in Fig. 6 and determine if the circuit is stable. Assume ideal op amps and the input signal is $v(t)$. (15%)

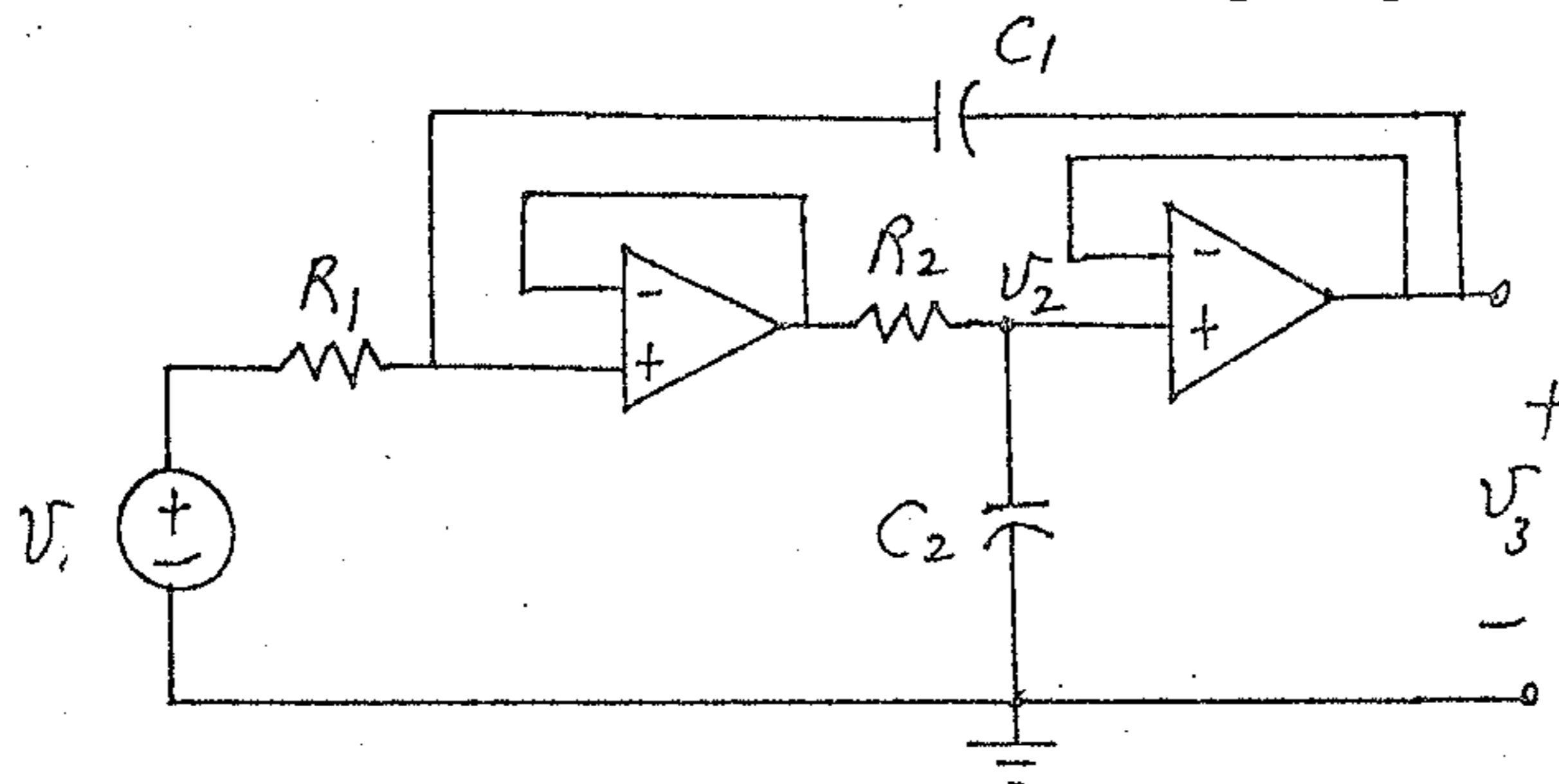


Fig. 6

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