

EELE 250: Circuits, Devices, and Motors

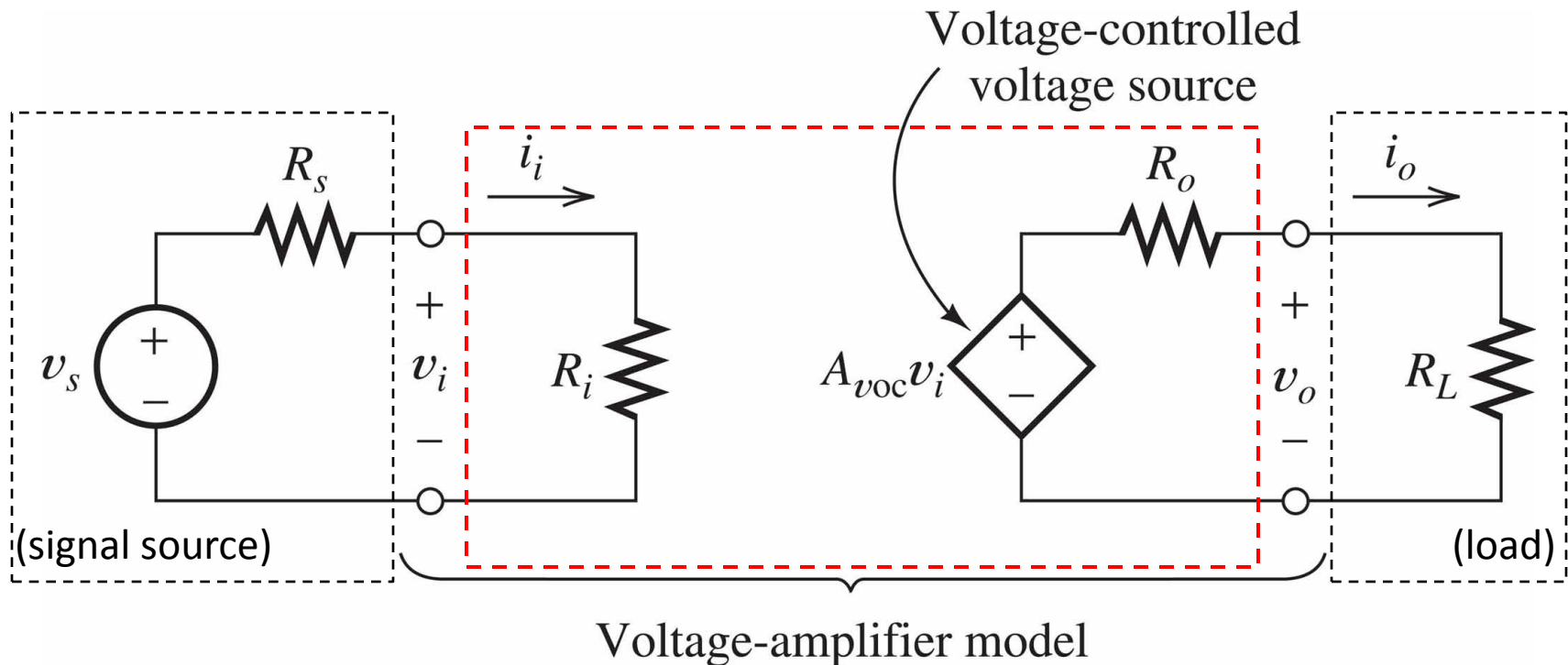
Op Amps (cont.)

Assignment Reminder

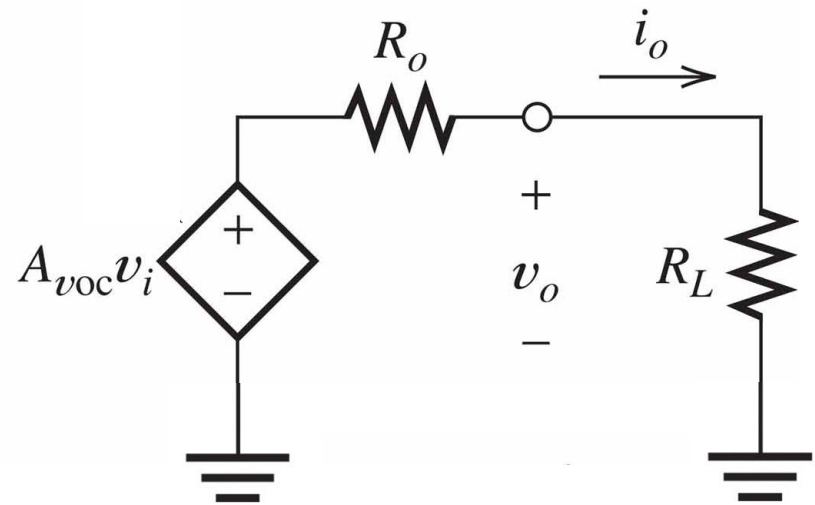
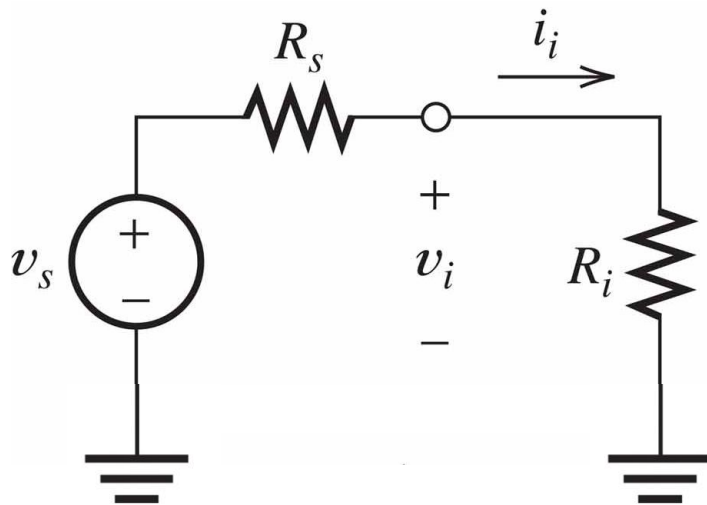
- Read 14.4 - 14.7
- Practice Problems:
 - P14.18, P14.20, P14.21, P14.23, P14.36, P14.38
- Lab #6 this week. Keep your circuits on your breadboard for use again next week in Lab #7.
- D2L Quiz #8 by 11AM on Monday 31 Oct.

Review: Amplifiers

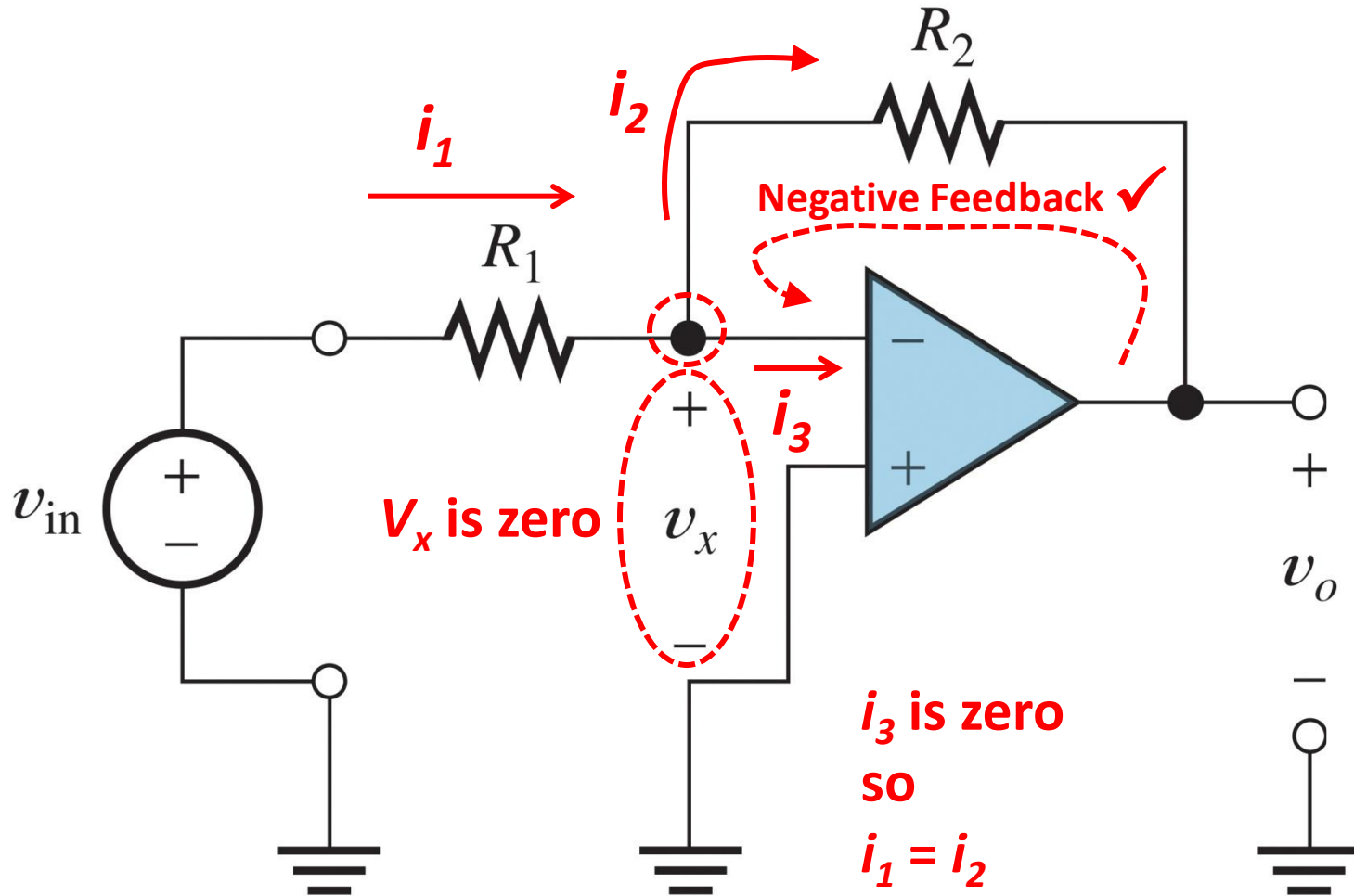
- A realistic voltage amplifier model includes a *big* input resistance R_i (ideally infinite) and a *small* output resistance R_o (ideally zero).



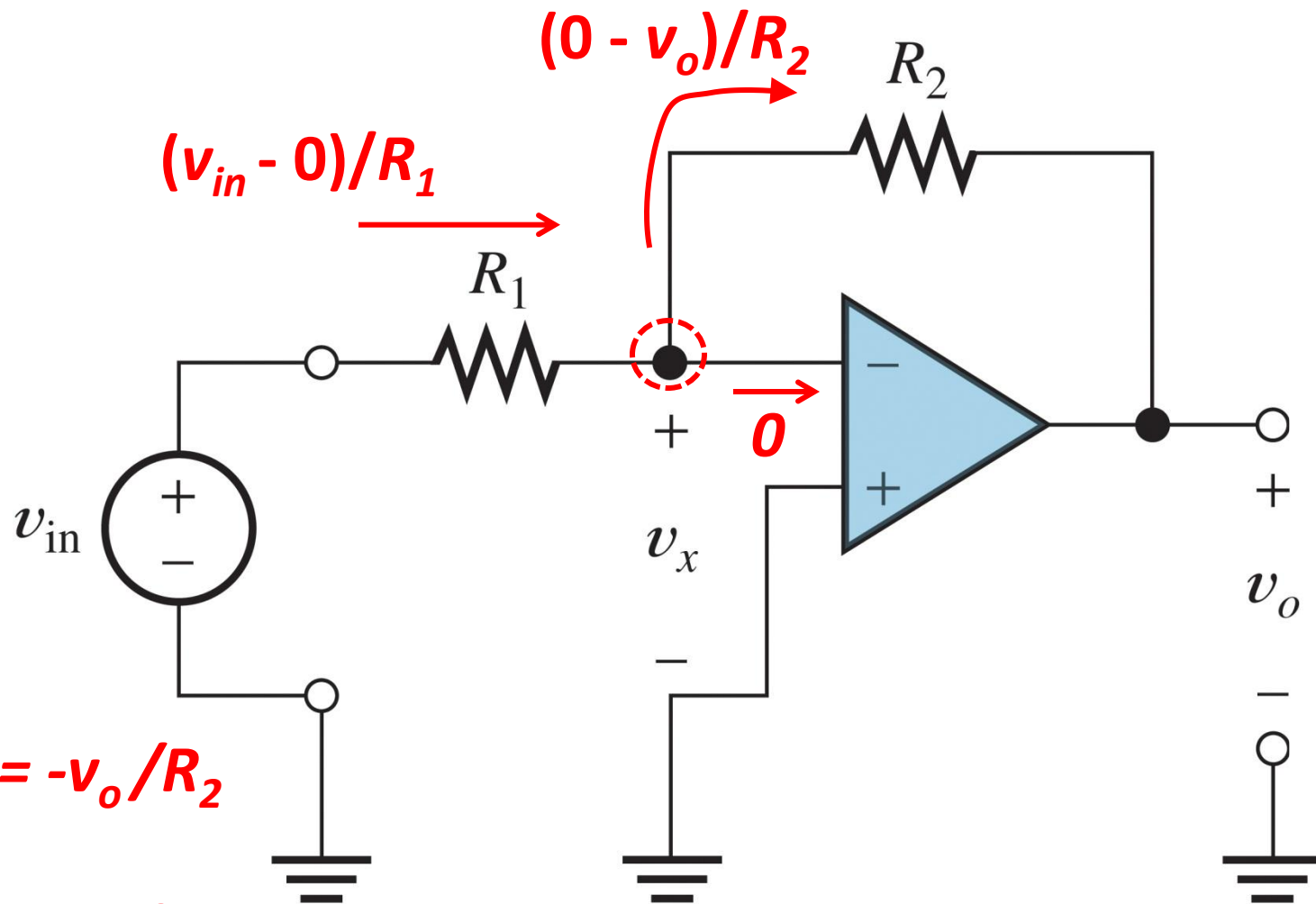
Node and ground notation



Ideal Op Amp Example



Ideal op amp (cont.)

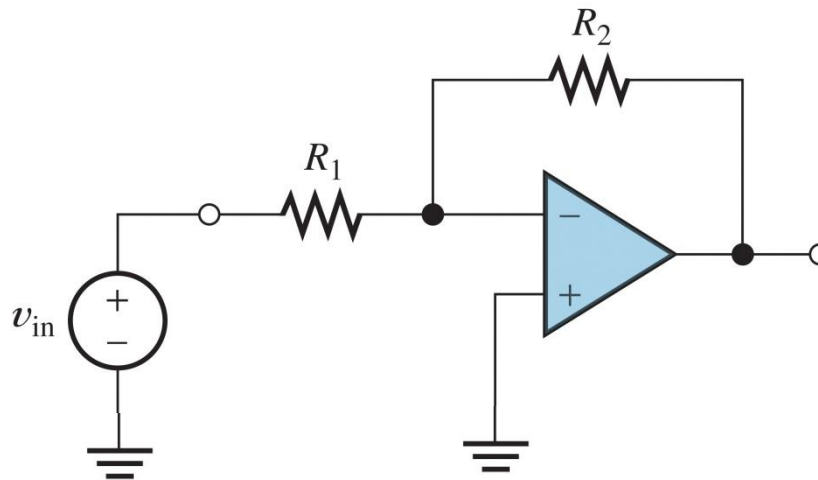


$$V_{in}/R_1 = -v_o/R_2$$

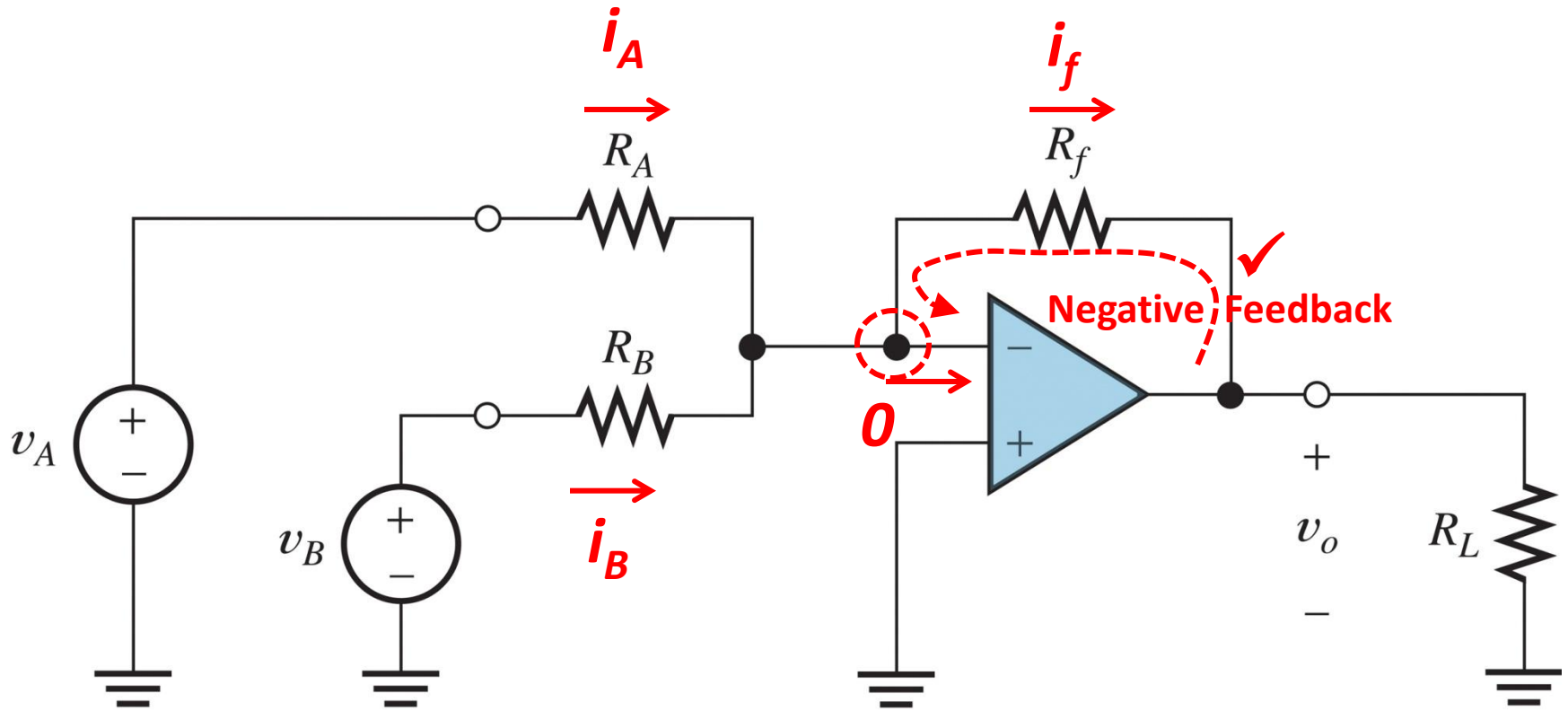
$$V_o/v_{in} = -R_2/R_1$$

Ideal Op Amp Summary

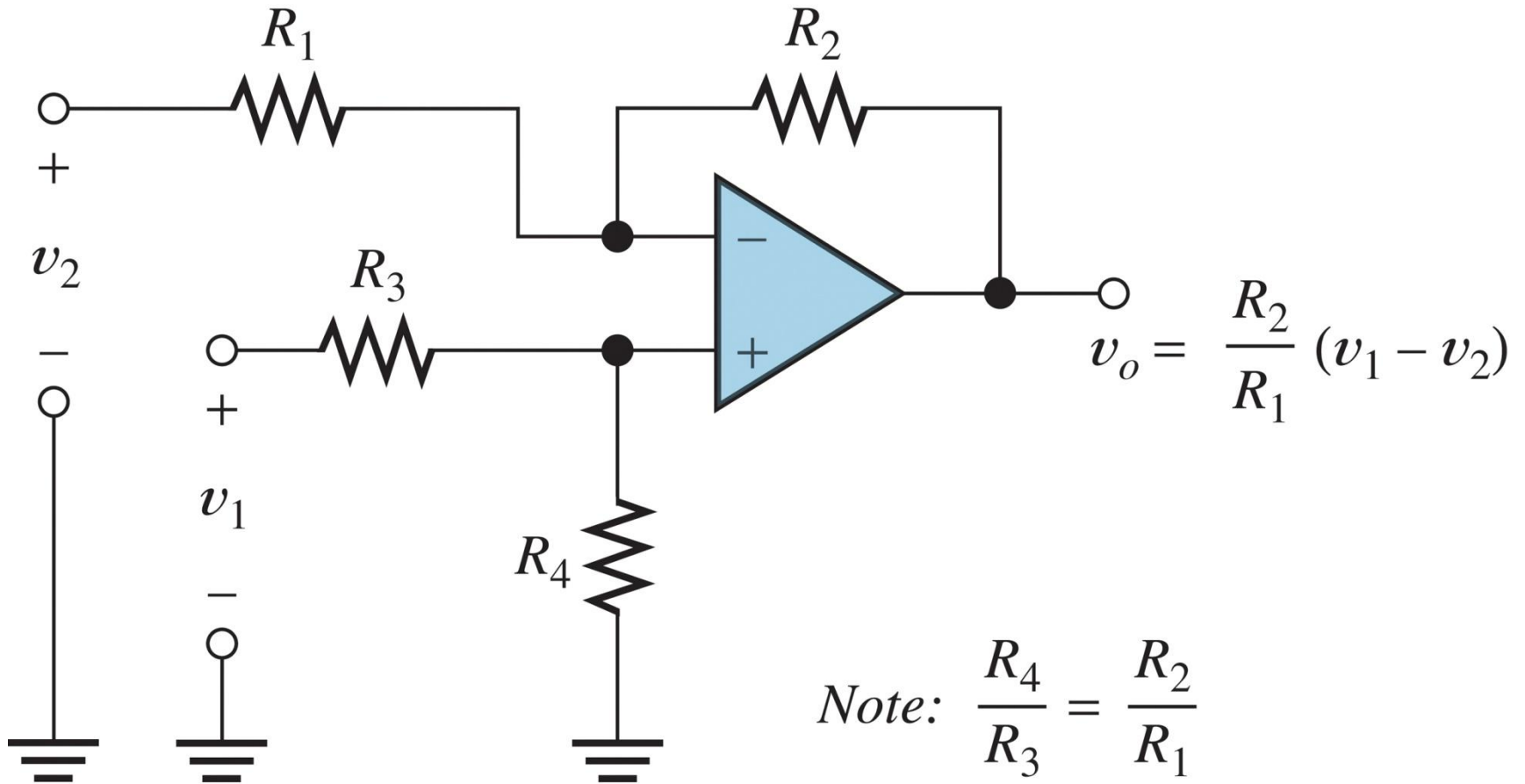
- High open-loop gain and negative feedback forces differential input voltage to be zero
- High input resistance forces input current to be zero
- Use these assumptions to analyze the closed-loop gain



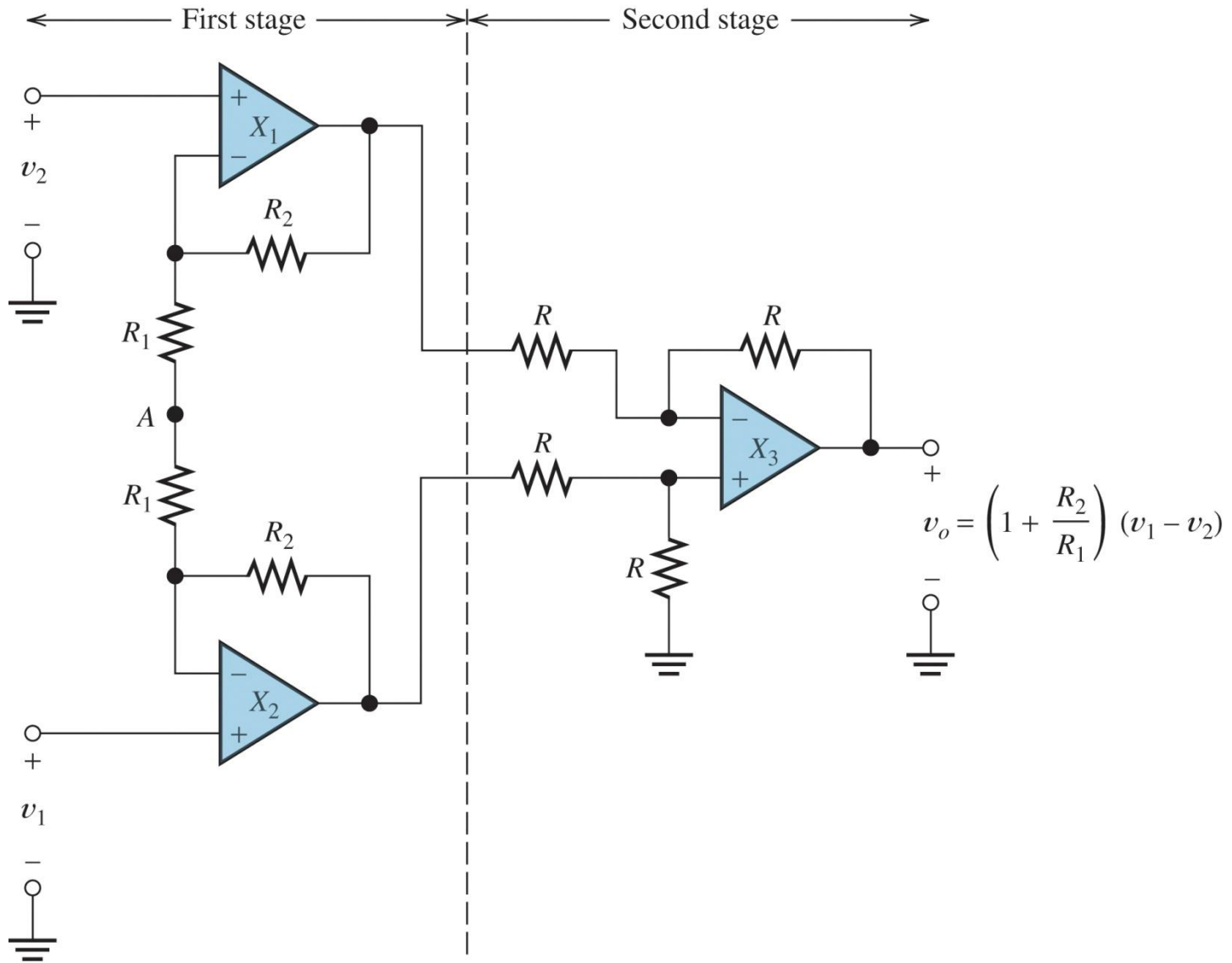
Adding two signals: summing amp



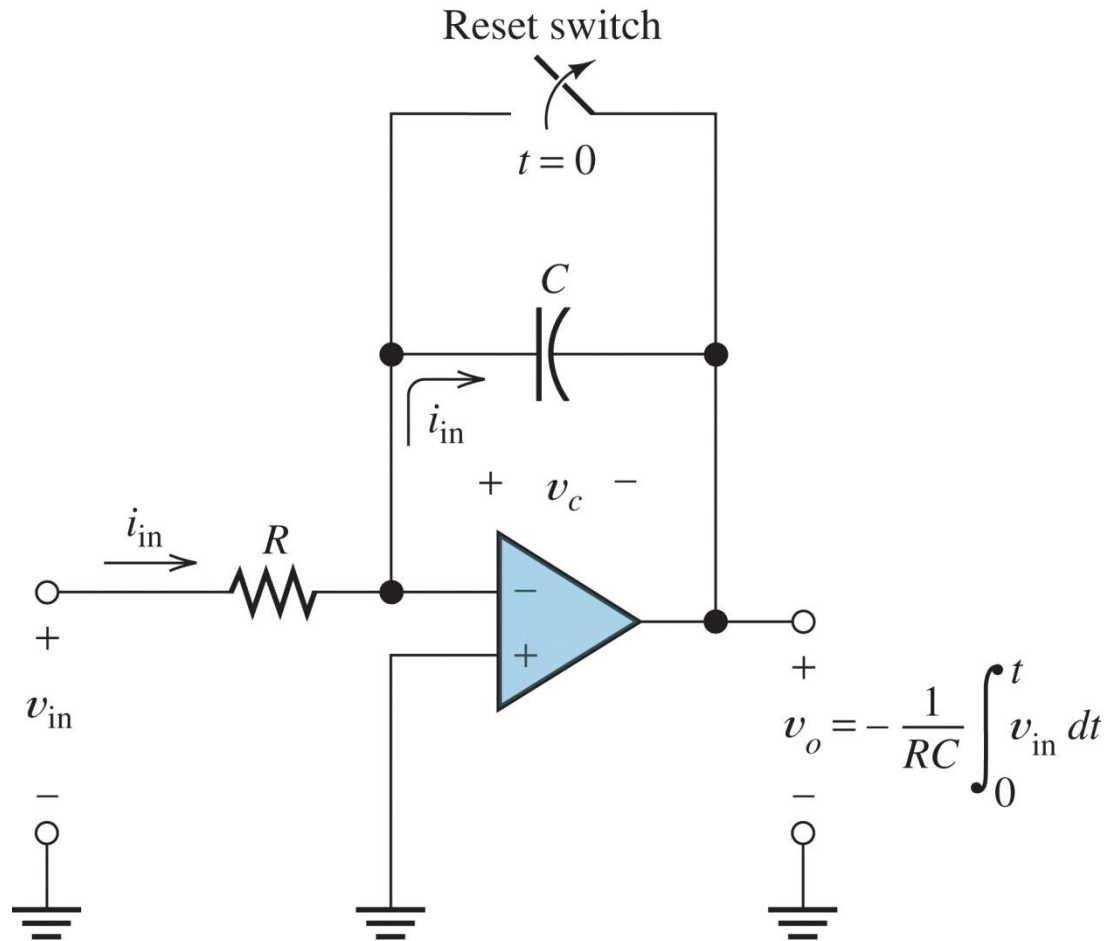
Differential amp



Instrumentation amp



Integrator



Differentiator

