Lecture 1: Admin & Overview

- Announcements:
- EE 140: Analog Integrated Circuits
- Instructor: Prof. Clark T.-C. Nguyen
- Screencast: wireless mic
  - Can view lectures at either
    http://itunes.berkeley.edu/ or
    http://www.youtube.com/ucberkeley
- For the course website, just google ee140
  - The website should be up and running in a couple of days
- Office Hour Changes?: None requested
- Discussion sections start next week
  - What about the TBD room for Section 102?
  - Th 2-5, specifically 4-5 (237 Cory might be open) – we will try for this; I will announce the results in the next lecture
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- Lecture Topics:
  - Review
    - —Ideal Op Amps
    - —Non-Ideal Op Amps
  - Op Amp Examples
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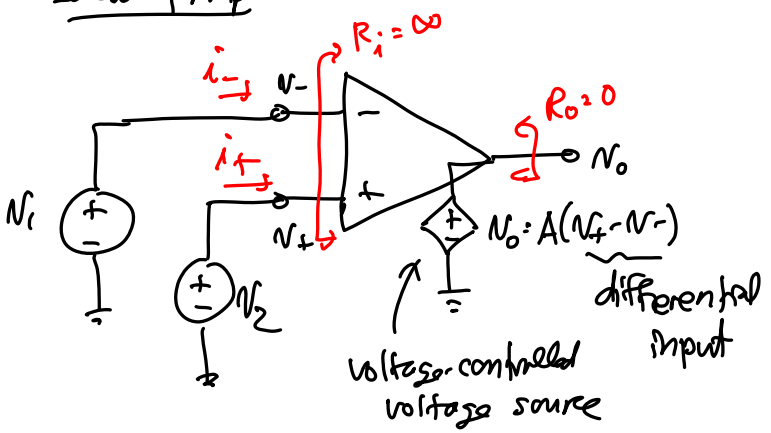
- Go though
  - Course information sheet
  - Syllabus
  - Grading Information and Policy
- Hand out class account sheets in class

Review of Op Amps

Ideal Op Amp:



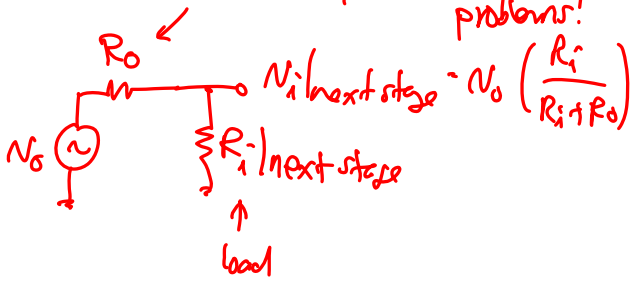
Properties of Ideal Op Amps:

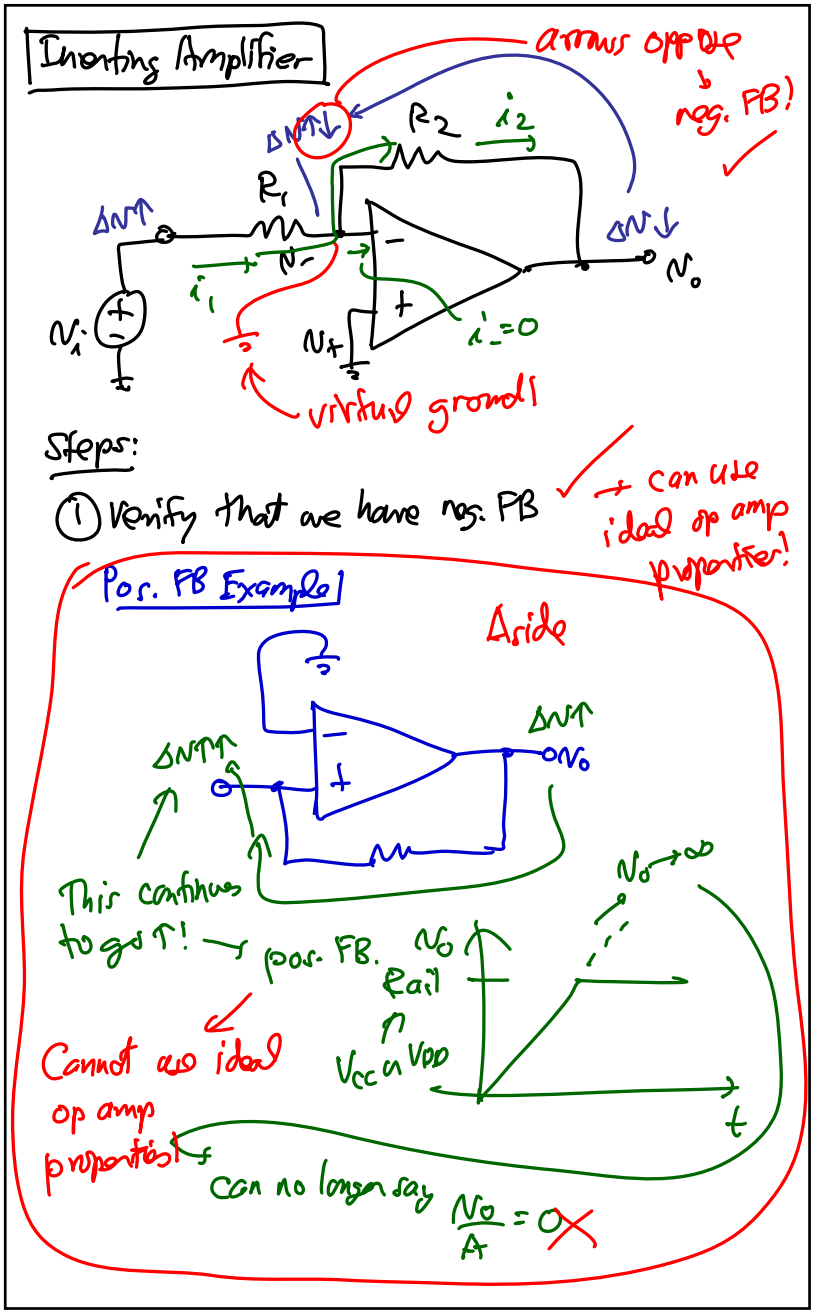
① $R_i = \infty \rightarrow i_- = i_+ = 0$ ← if we have neg. FB!

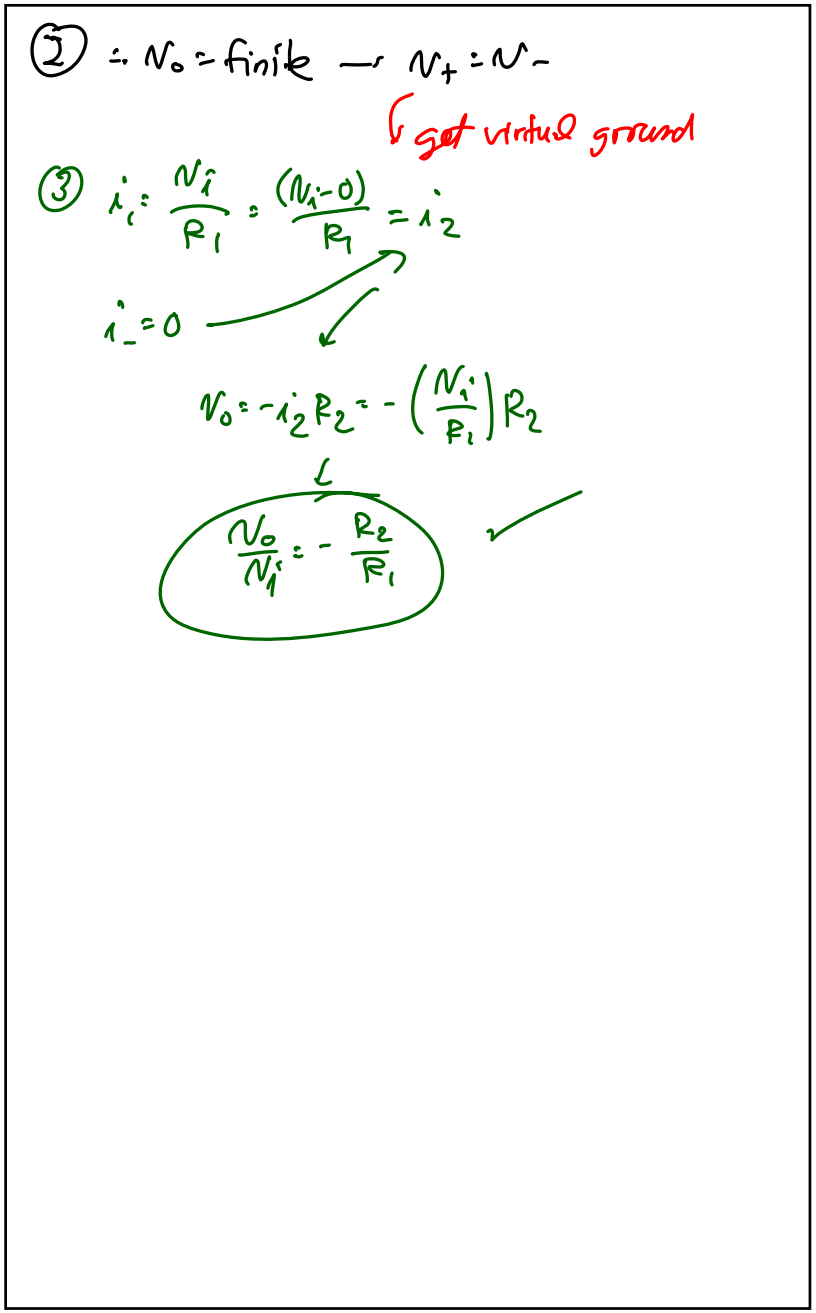
② Gain, $A = \infty \rightarrow v_+ = v_-$

③ Infinite BW (a freq. response) → v_o = finite!

④ $R_o = 0$ → Can drive any load w/ no problems!







- Non-Ideal Op Amps:
- Actual op amps, of course, are not ideal; rather, they …
  - Have finite gain, A_o
  - Have finite bandwidth, BW
  - Have finite input resistance, R_i
  - Have finite input capacitance, C_i
  - Have finite output resistance, R_o
  - Generates noise
  - Have input bias currents (because R_i is not infinite)
  - Have input offset currents and voltages
  - Have finite slew rate
  - Have finite output swing
- All of the above can be temperature dependent!
- A major objective of this class is understand what gives rise to the above non-idealities and to teach design strategies to get around them
- Then look at op amp usage examples using prepared pages