BJT DIFFERENTIAL
Large Signal Operation of BJT Differential Pair

- This is a ____________________ controlled by the ____________________
  in voltage between $V_{B1}$ and $V_{B2}$
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Small-signal model:

- Note that output can be taken differentially ($V_{C1} - V_{C2}$) or single-ended ($V_{C1}$ or $V_{C2}$ alone, referenced to ground)
Problem: No perfect current sources!

- Tough to analyze
  - TRICK: Split circuit into ____________________________
  - Rewrite inputs as

- This shows that R has ____________________________________________

New circuit:

Analyze as separate circuits.
What is so bad about a non-ideal current source then? ________________

Small-signal:
Nonideal characteristics of Diff. Amps:

- Input offset voltage:

- This can be modeled as:

- Input bias currents can be mismatched due to ______________________________