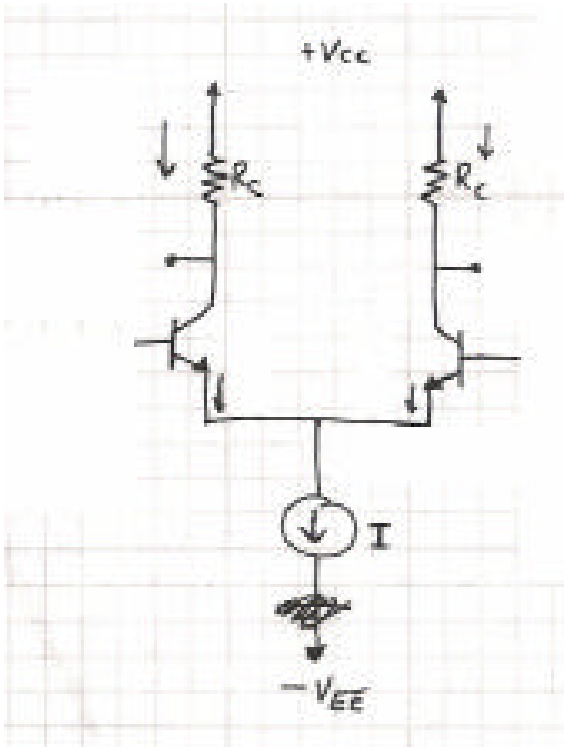
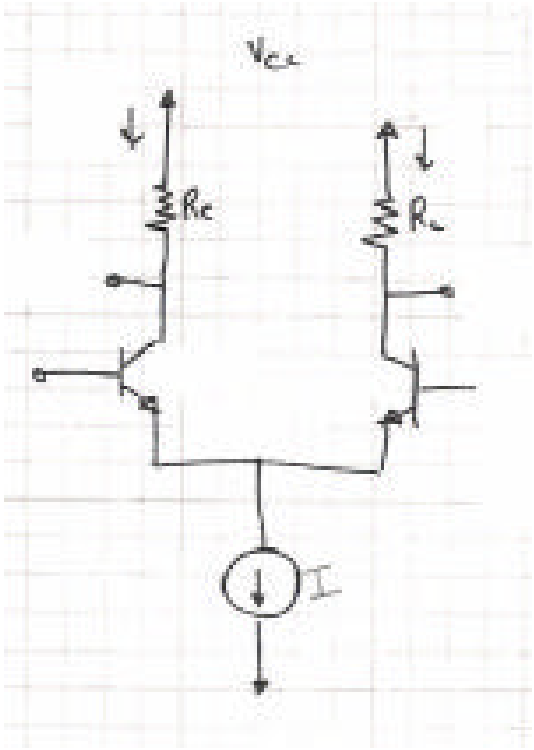
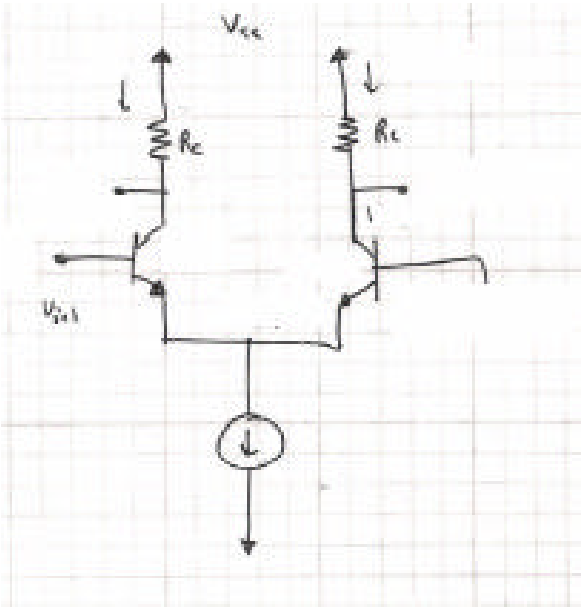
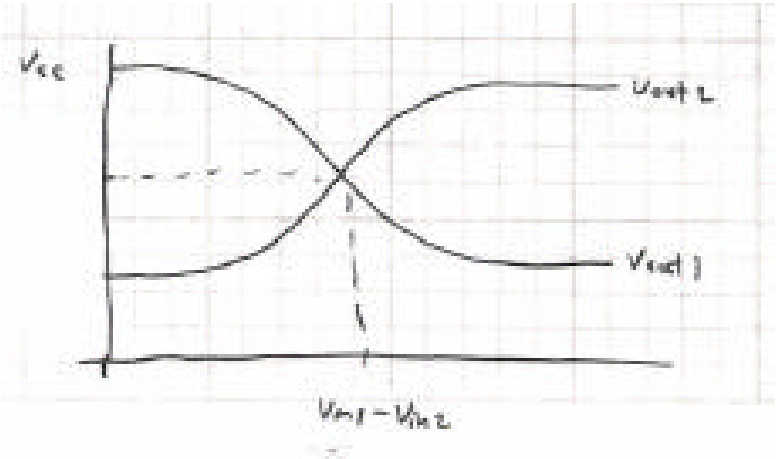
BJT DIFFERENTIAL





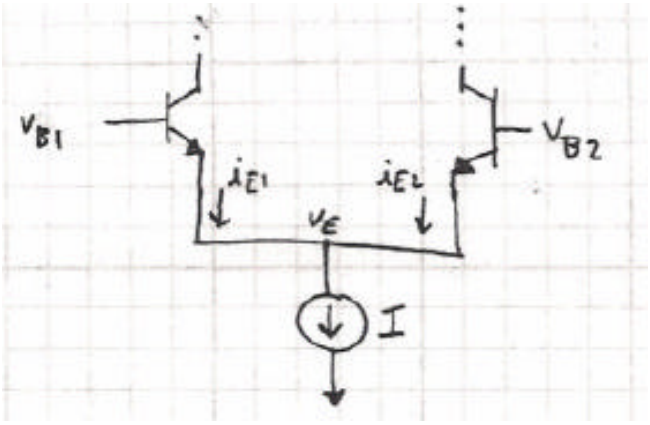
BJT DIFFERENTIAL





BJT DIFFERENTIAL

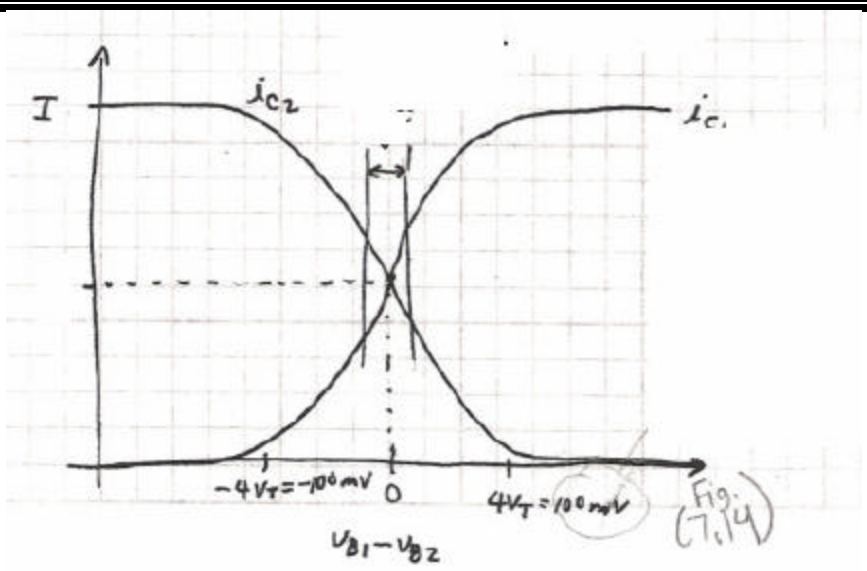
Large Signal Operation of BJT Differential Pair



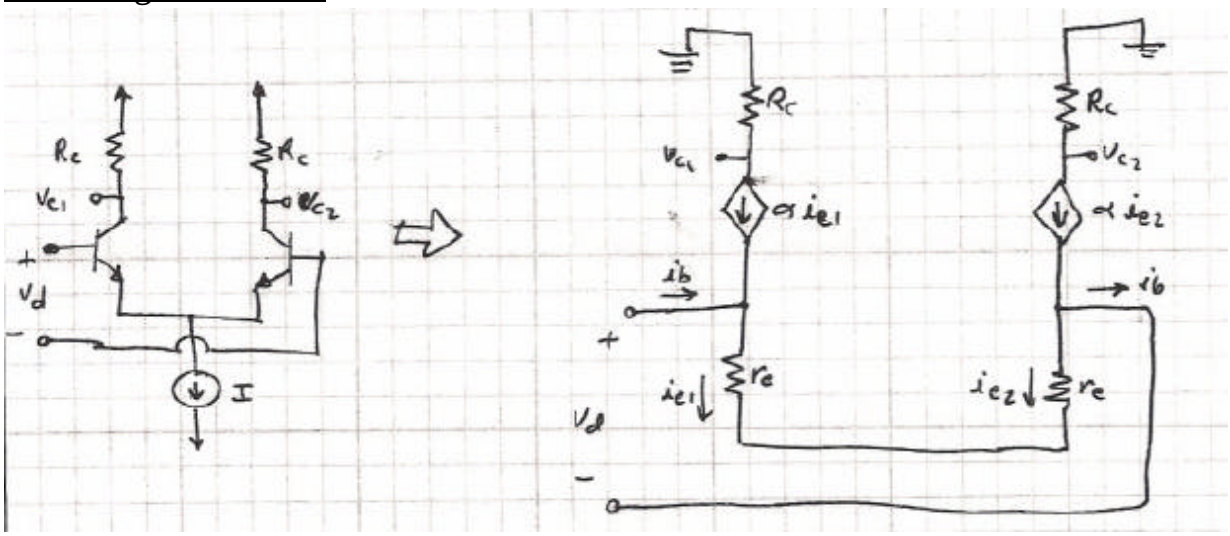
- This is a _____ controlled by the _____

in voltage between V_{B1} and V_{B2}

BJT DIFFERENTIAL



Small-signal model:

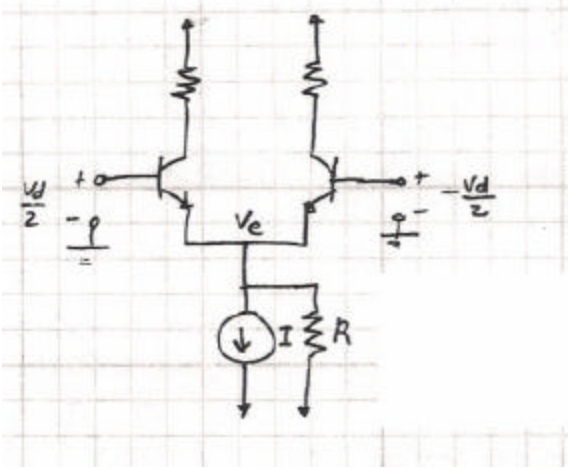


- Note that output can be taken <u>differentially</u>(V_{C1}-V_{C2}) or <u>single-ended</u> (V_{C1} or V_{C2} alone, referenced to ground)

BJT DIFFERENTIAL

What is the differential input resistance?

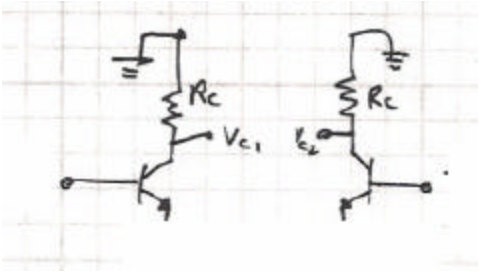
Problem: No perfect current sources!



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

- This shows that R has _____

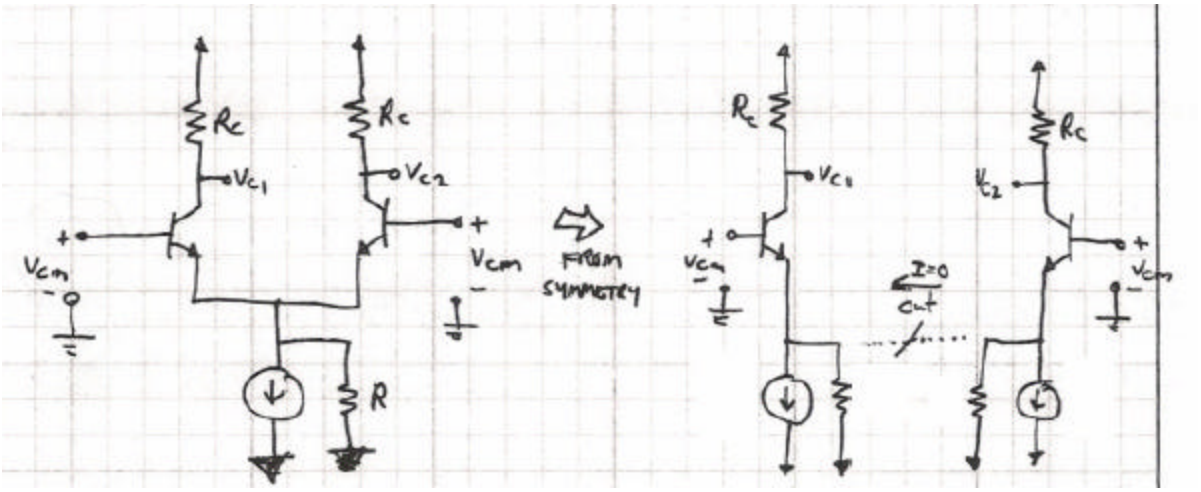
New circuit:



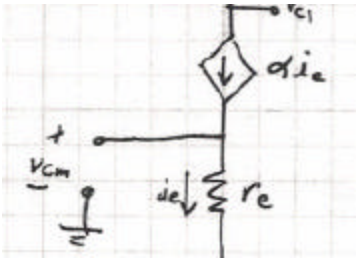
Analyze as separate circuits.

BJT DIFFERENTIAL

What is so bad about a non-ideal current source then? _____



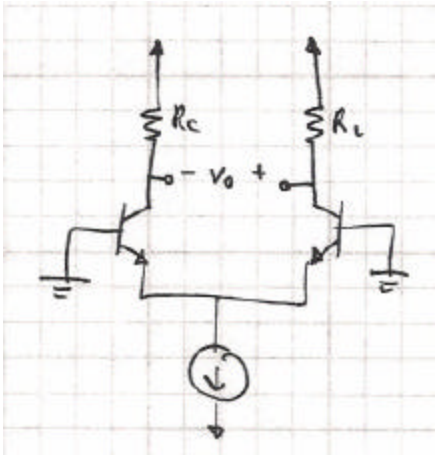
Small-signal:



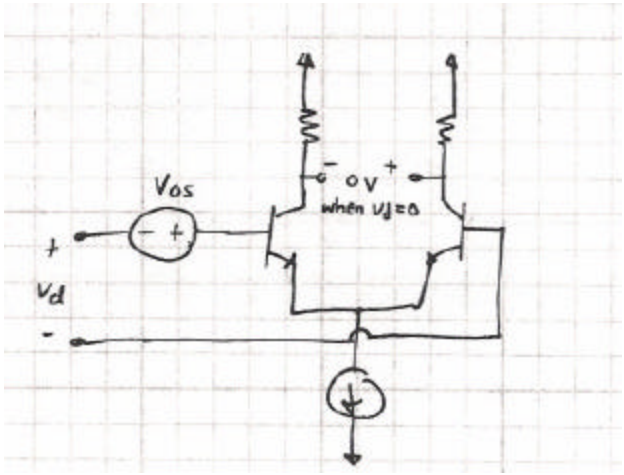
BJT DIFFERENTIAL

Nonideal characteristics of Diff. Amps:

- Input offset voltage:



- This can be modeled as:



- Input bias currents can be mismatched due to _____