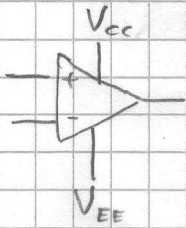


Op Amps IICaution:

All rules apply only when:

- ① the op-amp is in the active region  
→ inputs & outputs between  $V_{CC}$  &  $V_{EE}$ .
- ② Feedback is negative. For
- ③ There must be feedback at DC, otherwise the output will saturate.
- ④ There is a maximum allowable voltage difference between (+) & (-).

Ideally op-amps have:

- ① Input impedance =  $\infty$
- ② Output impedance = 0
- ③ Voltage gain =  $\infty$
- ④ CM gain = 0
- ⑤  $V_{out} = 0$  For (+) = (-)
- ⑥  $V_{out}$  changes instantaneously  
slew rate =  $\infty$

↑  
We will see that none  
of these are really true.