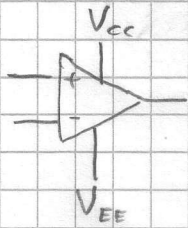


# Op Amps II

## Caution:



- 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  
slow rate =  $\infty$

↑

We will see that none of these are really true.