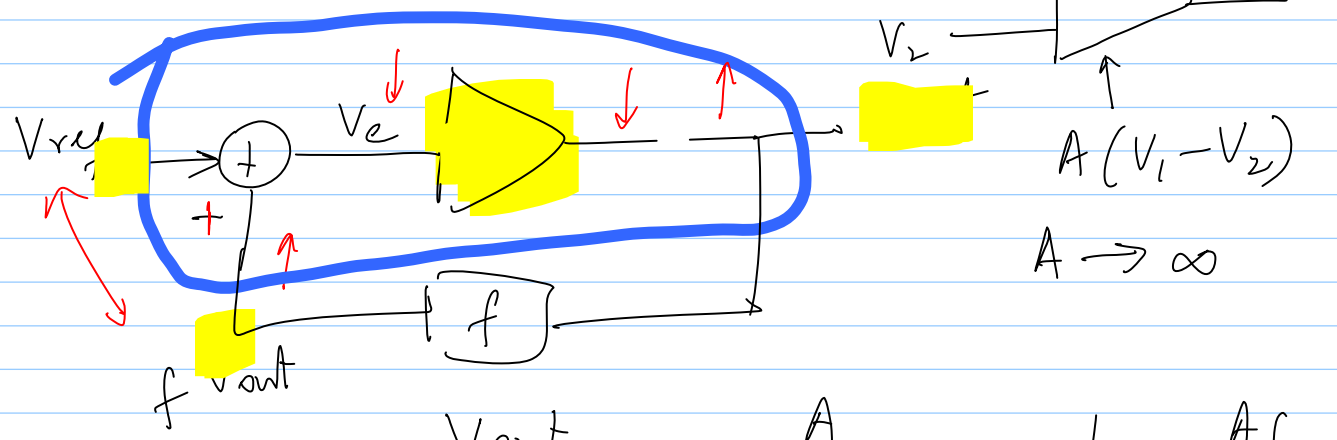
14-9-12

Lec 20



$$\frac{V_{out}}{V_{req}} = \frac{A}{1+Af} = \frac{1}{f} \cdot \frac{Af}{1+Af}$$

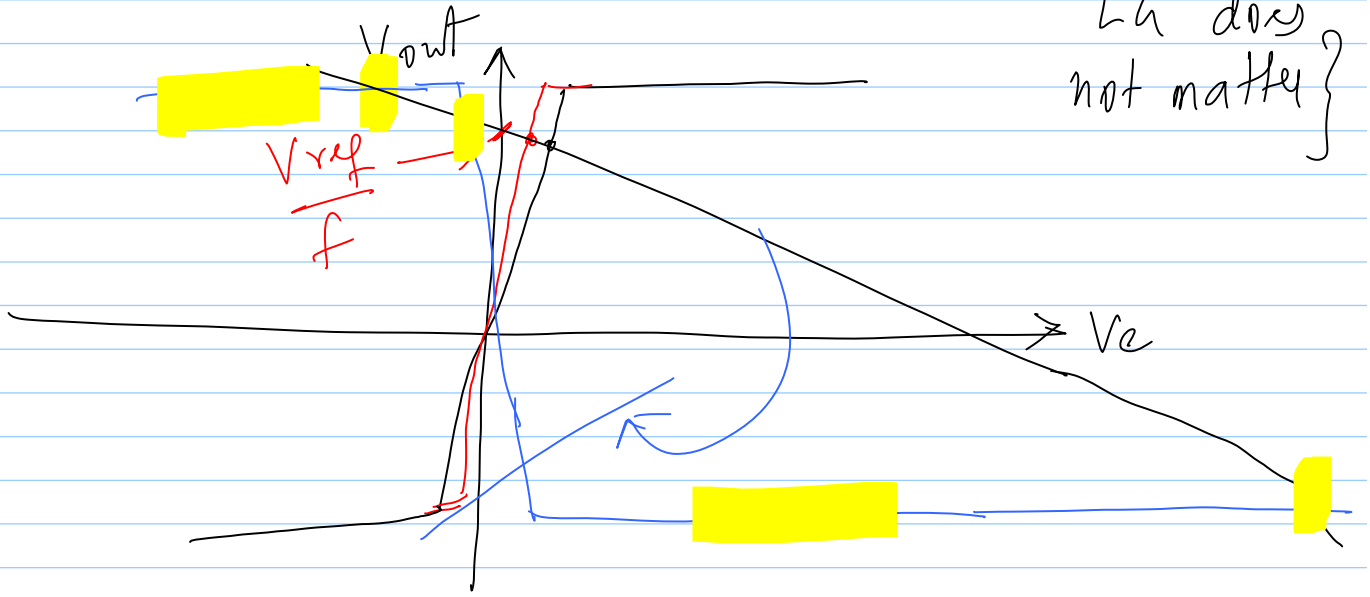
$Af \equiv$ Loop Gain

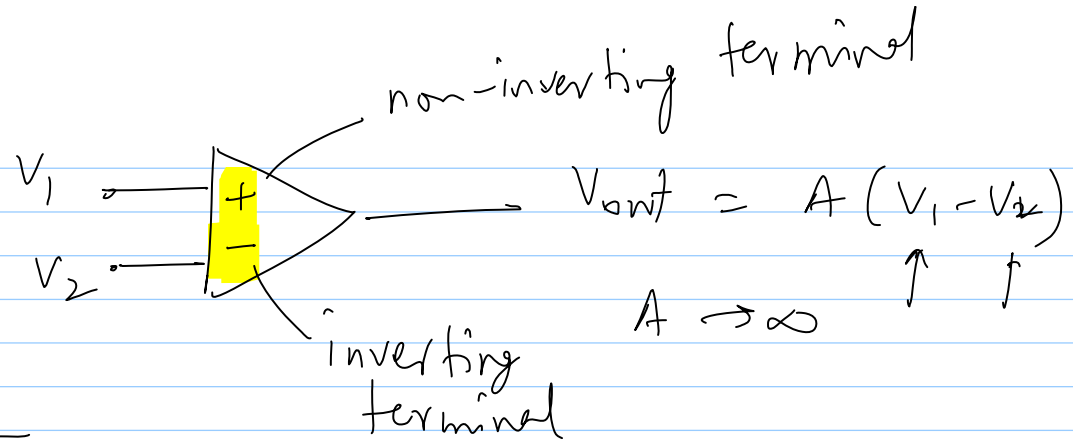
$\frac{A}{1+Af} \equiv$ CLOSED LOOP GAIN

$V_e = 0$

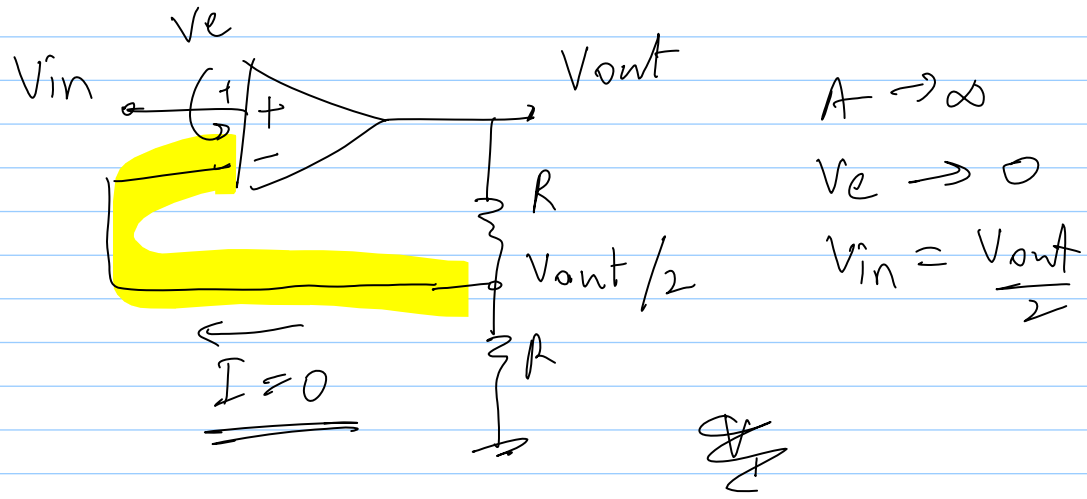
$Af \to \infty \quad (LG \to \infty)$

If $LG \to \infty$, $CLG = \frac{1}{f}$ { actual value of LG does not matter }





Opamp

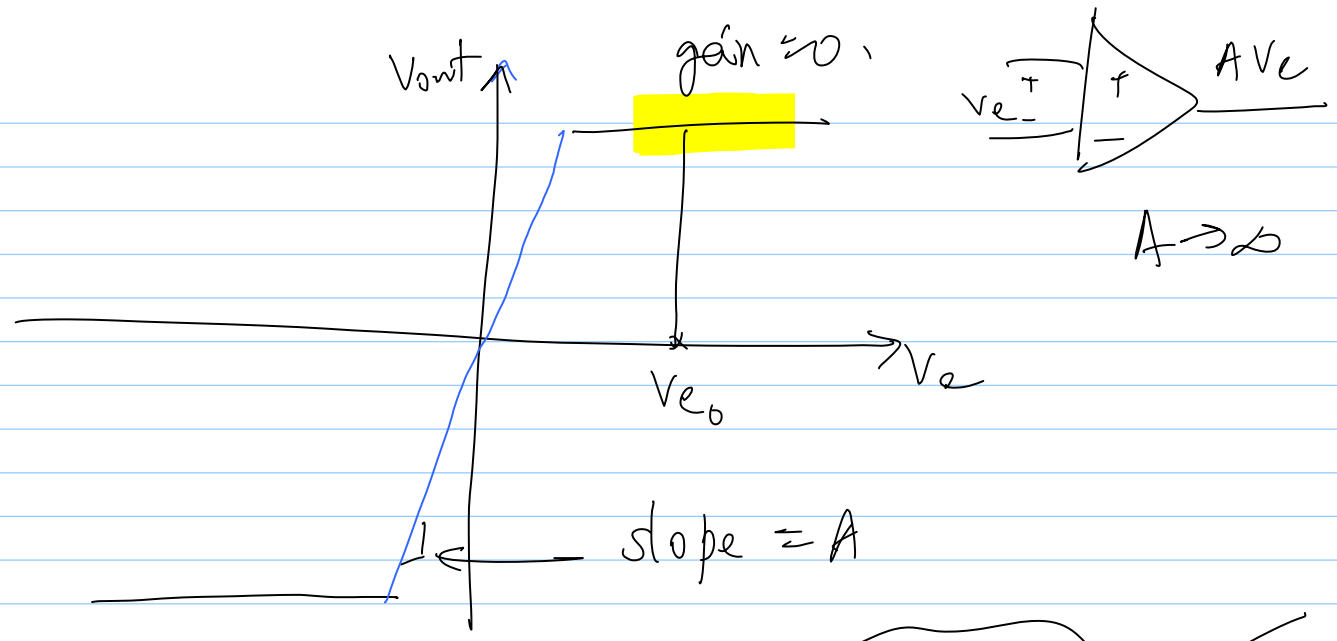


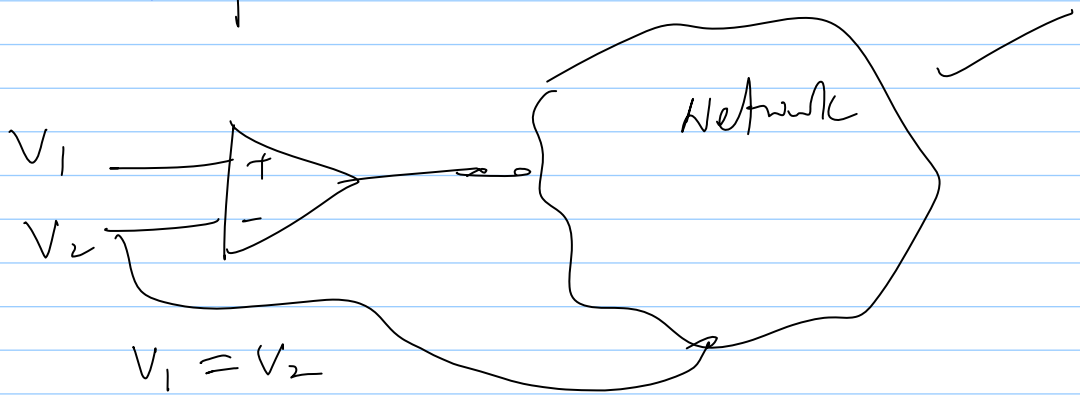
1) gain $= -2$

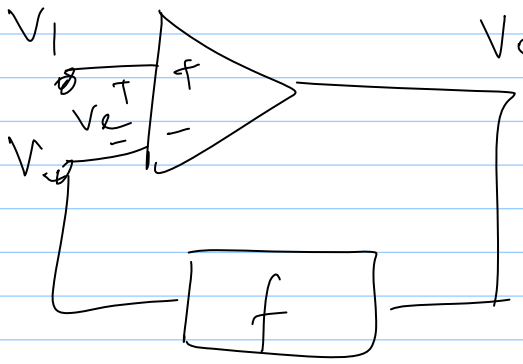
2) V_{out} = max. voltage possible

ideal

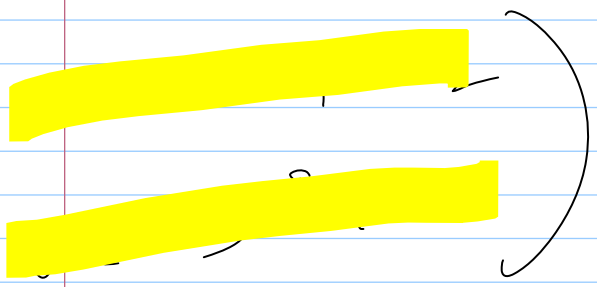
$$V_{out} = \left(-V_{in} + \frac{V_{out}}{2}\right) \cdot A$$



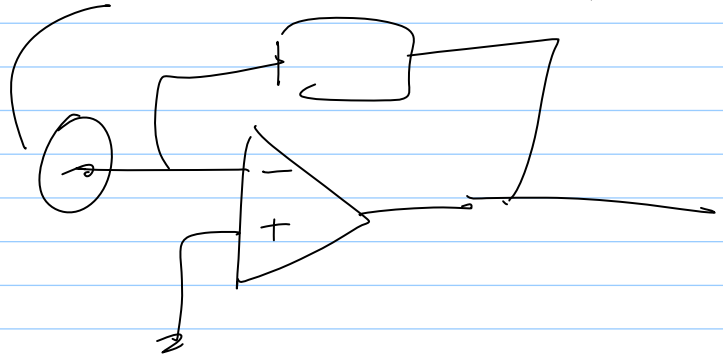




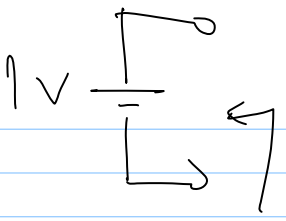
$$V_{out} = A(V_1 - V_2)$$
$$= A(V_e)$$

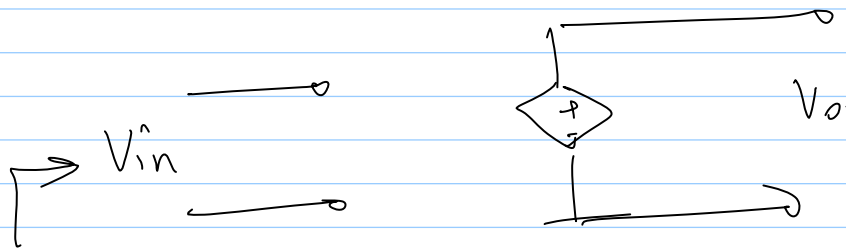


Virtual Ground/Node



Ideal VCVS





$V_{out} = A \cdot V_{in}$

$Z_{in} = \infty$

$Z_{out} = 0$

	Z_{in}	Z_{out}
VCVS	∞	0
VCCS	∞	∞
CCVS	0	0
CCCS	0	∞