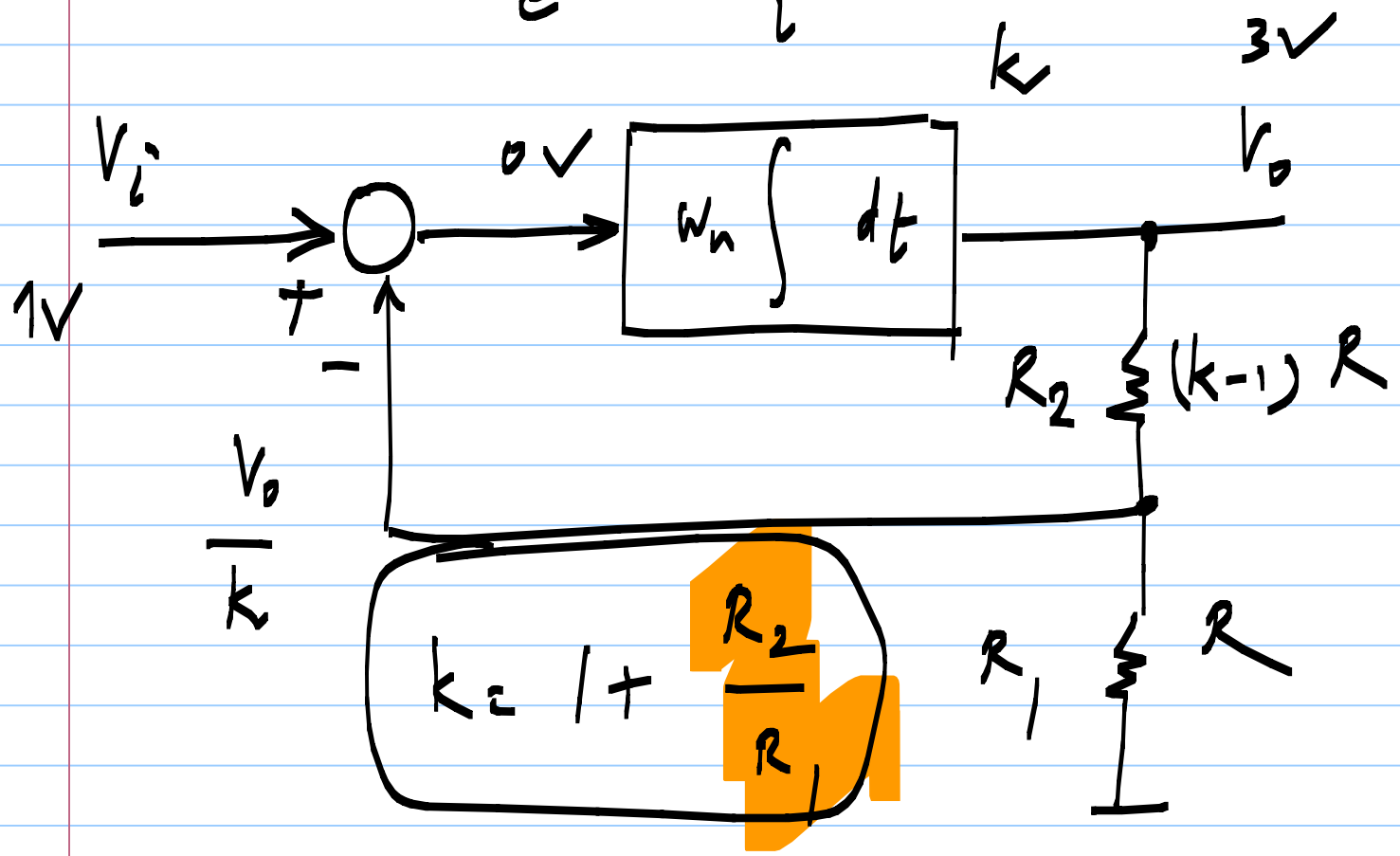
EE2019

3

$V_o = kV_i$

19/1/2018

$V_e = V_i - \frac{V_o}{k}$



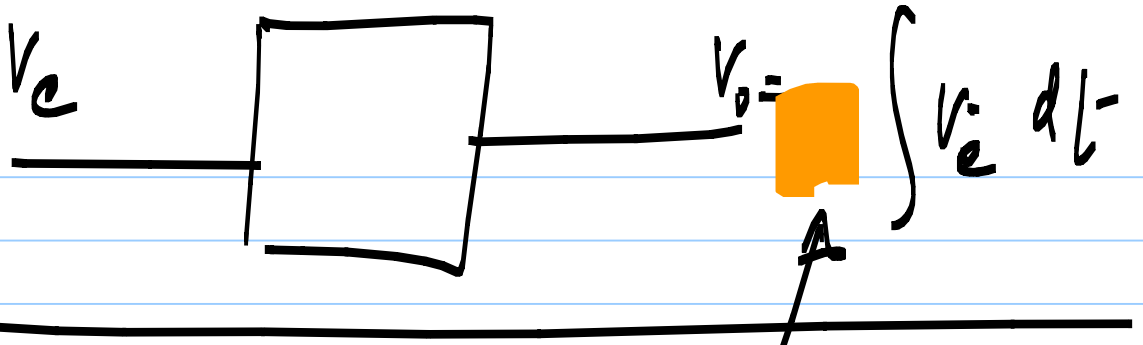
$$\frac{dV_0}{dt} = w_n \left(V_i - \frac{V_0}{k} \right)$$

$$\frac{dV_0}{dt} + \frac{w_n}{k} \cdot V_0 = w_n \cdot V_i$$

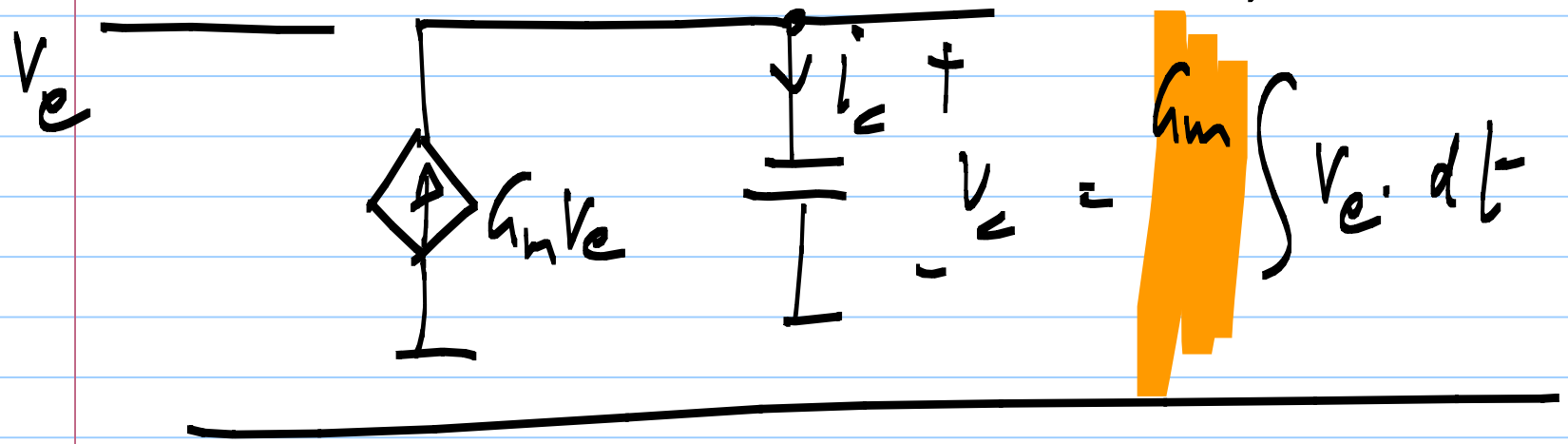
$$\frac{k}{w_n} \cdot \frac{dV_0}{dt} + V_0 = k \cdot V_i$$

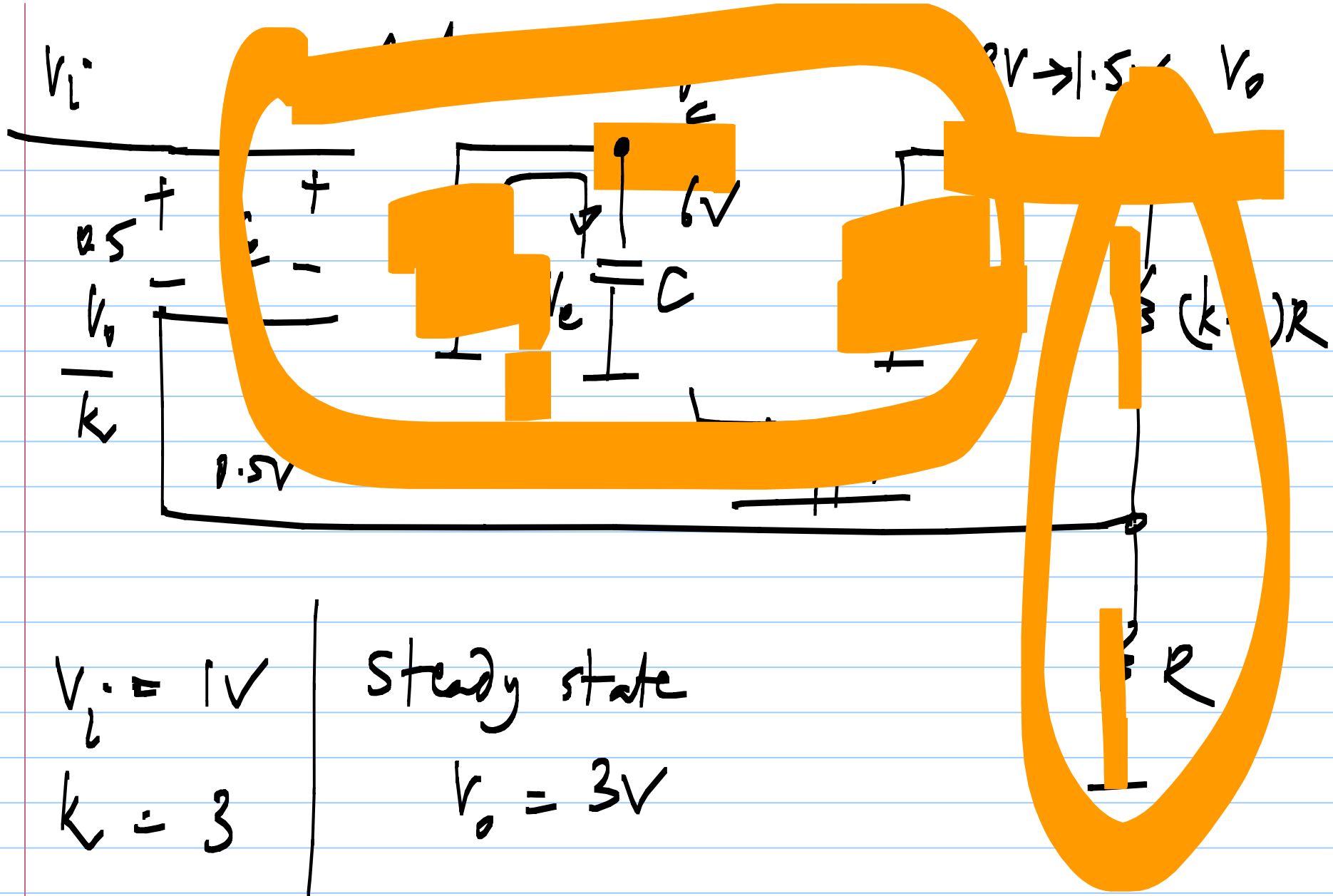
$$\exp\left(-\frac{w_n}{k} \cdot t \right)$$

Integrator



R, L, C controlled sources





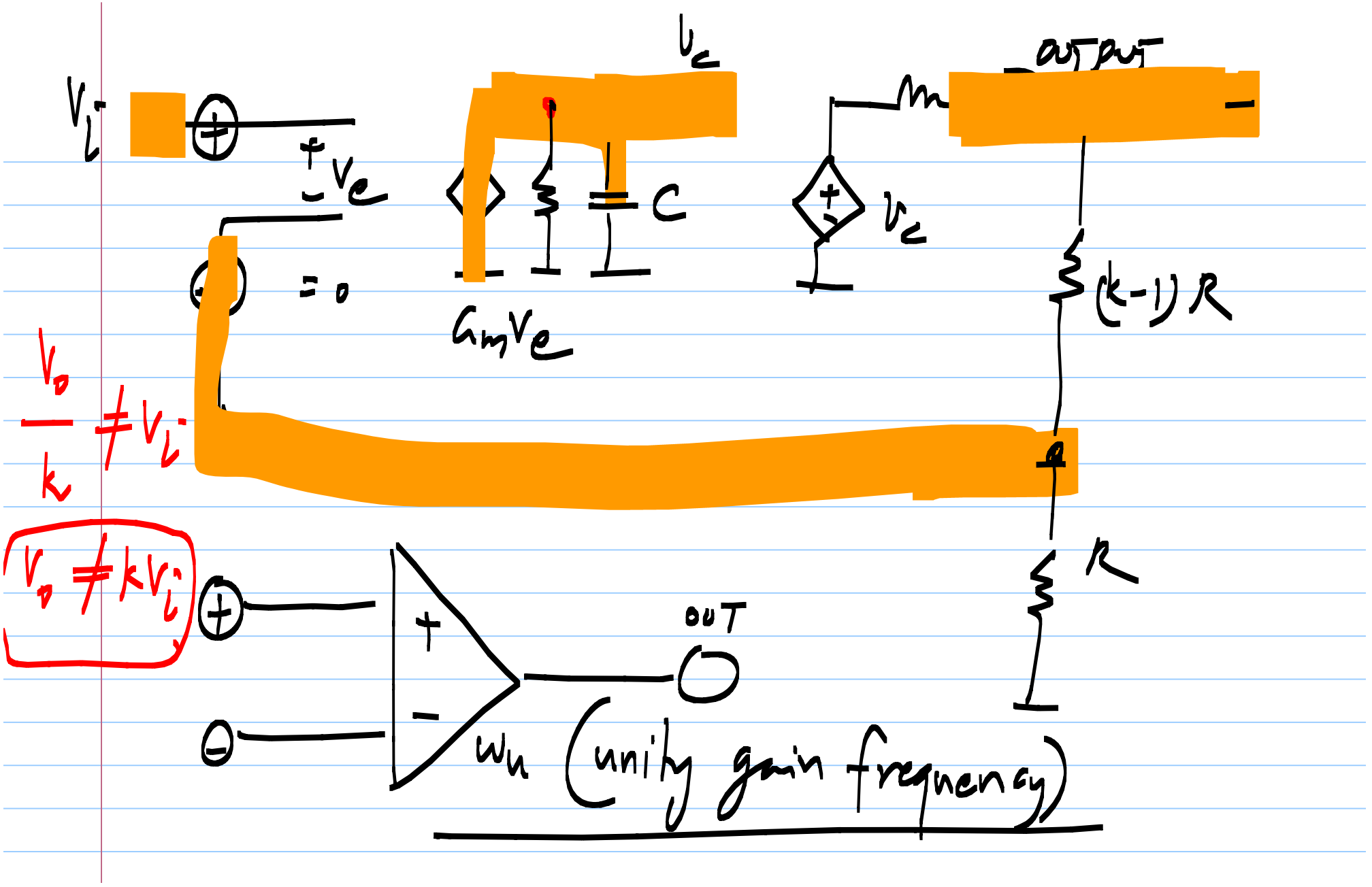
$V_i = 1V$

$k = 3$

steady state

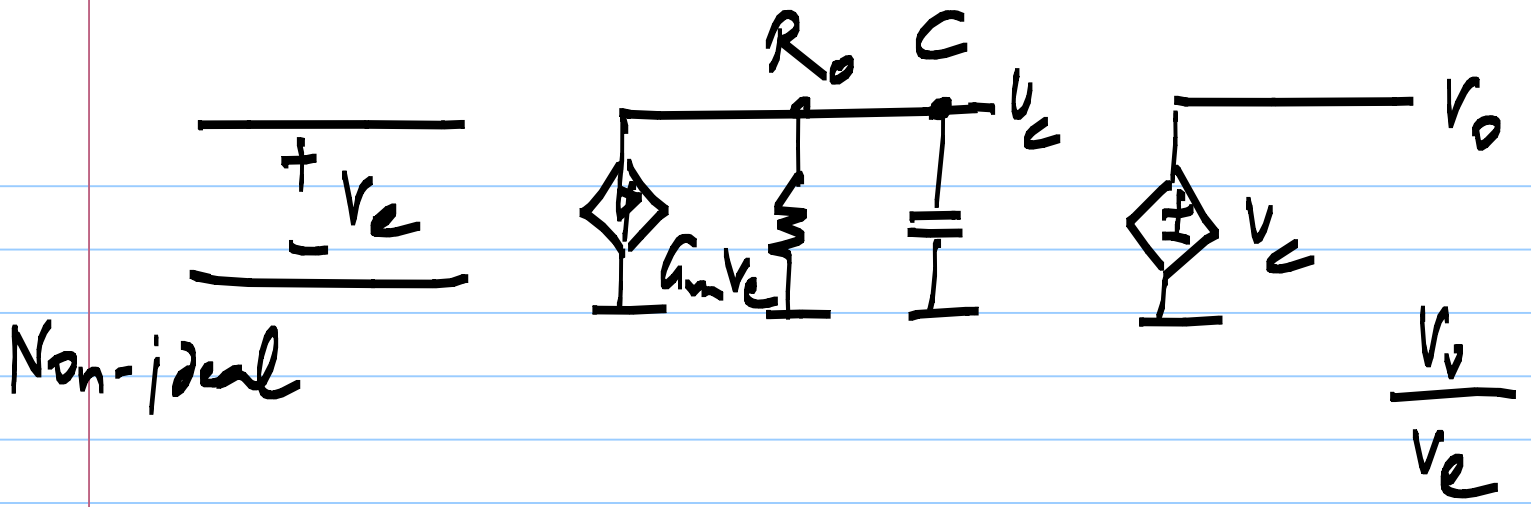
$V_o = 3V$

+
1
H
Feedback path


V_i
$+ V_e -$
$= 0$
V_c
C
$G_m V_e$
output
V_c
$(k-1)R$
R
$\frac{V_o}{k} \neq V_i$
$V_o \neq k V_i$
+
−
OUT
ω_u (unity gain frequency)

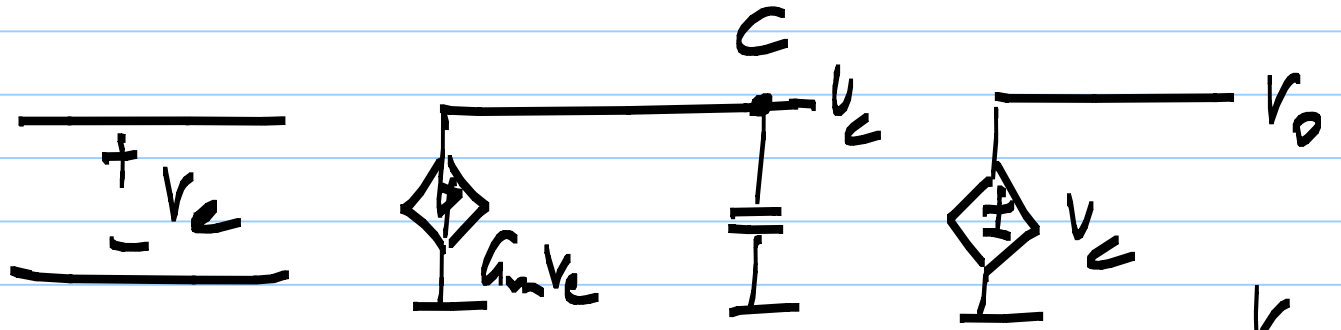
Non-inverting Amplifier

$$\frac{V_o}{V_i} = K > 0$$



Non-ideal

$$\frac{v_o}{v_e}$$



Ideal

$$\frac{v_o}{v_e}$$