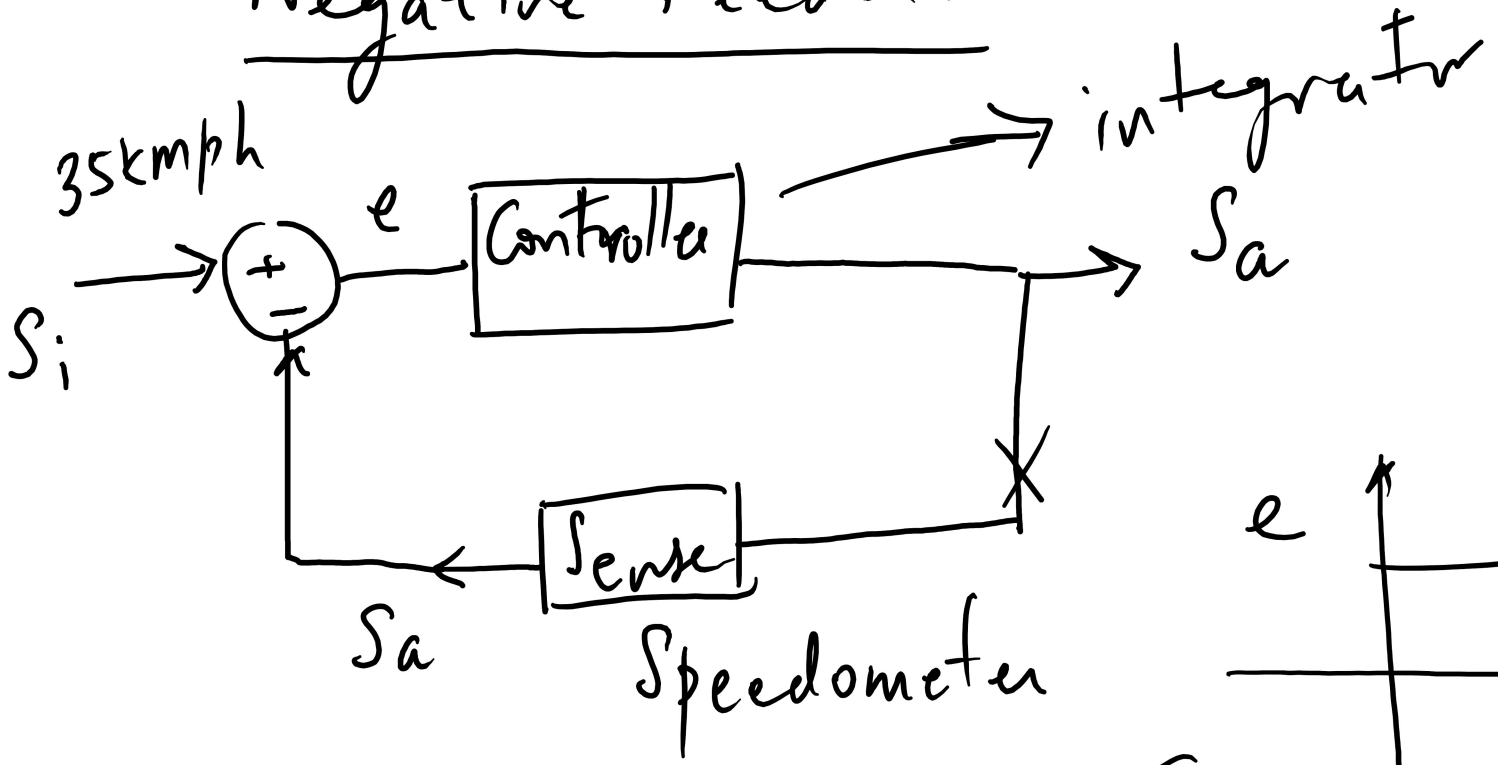
18/1/19

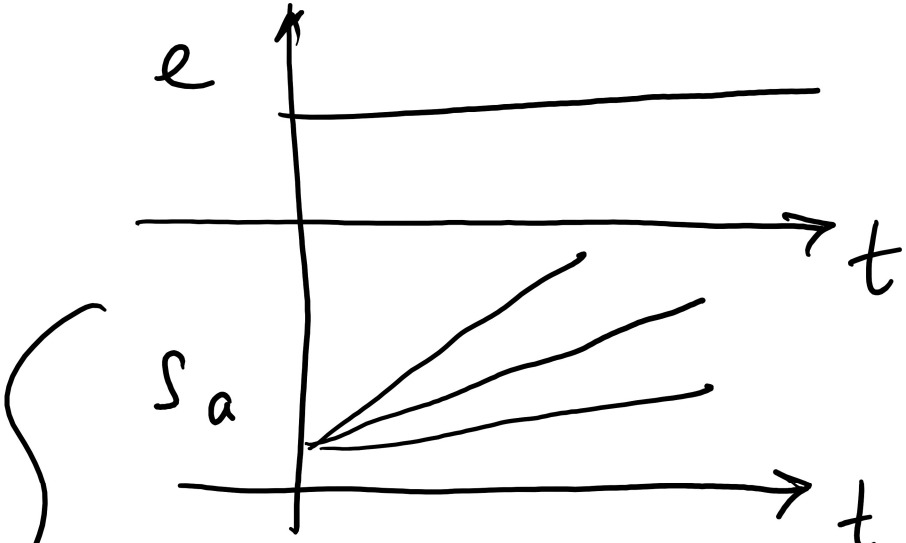
Lec 2

Negative Feedback

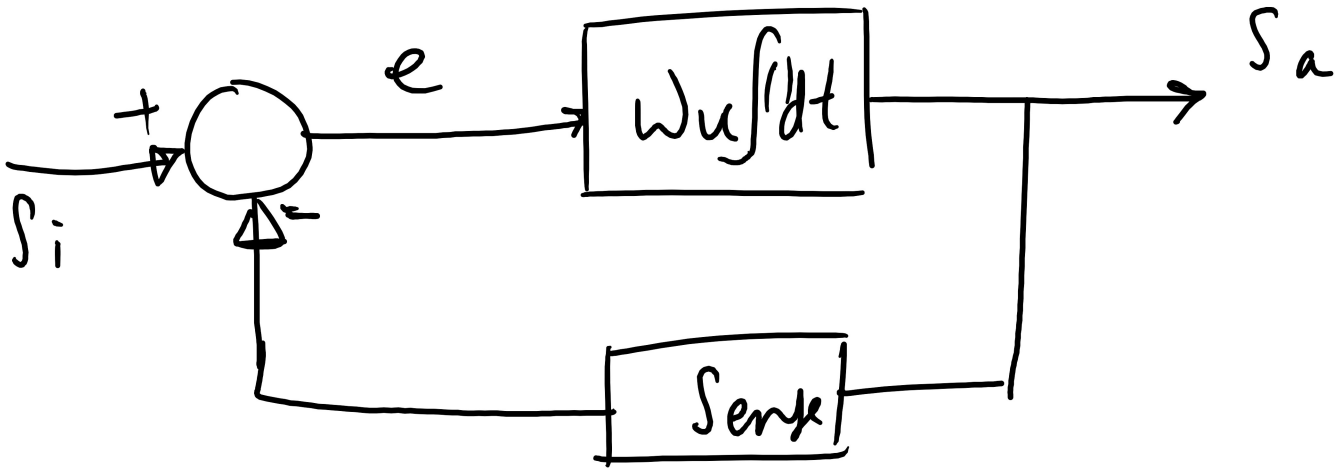


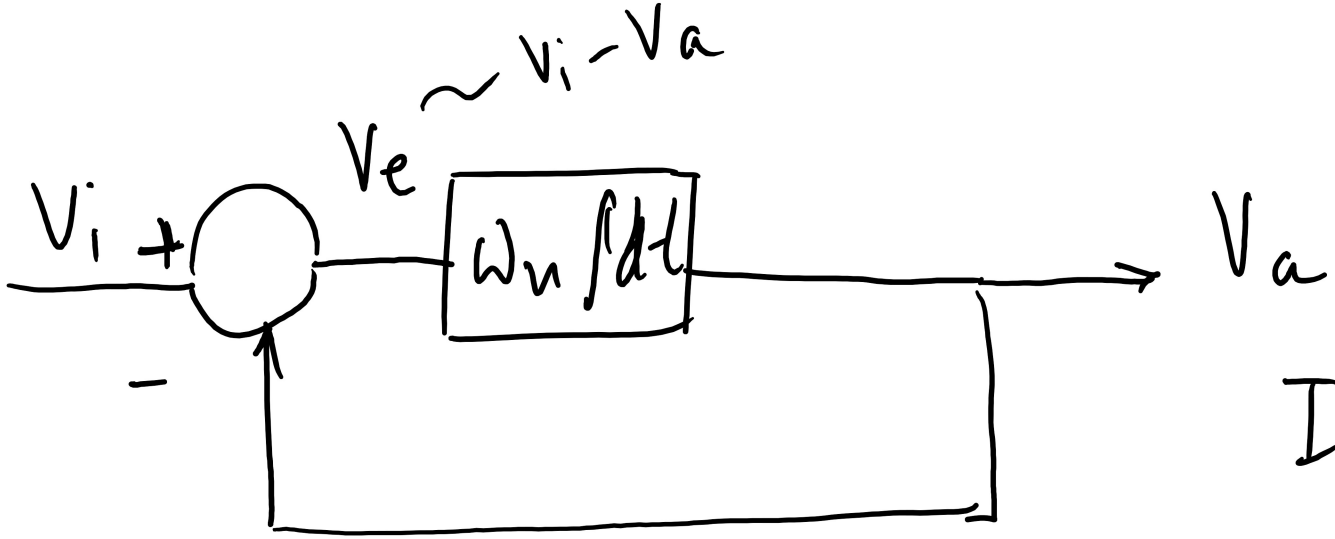
$$S_a = k \int e \, dt$$

ω_u



speedometer is broken





In steady state

$V_a = V_i$

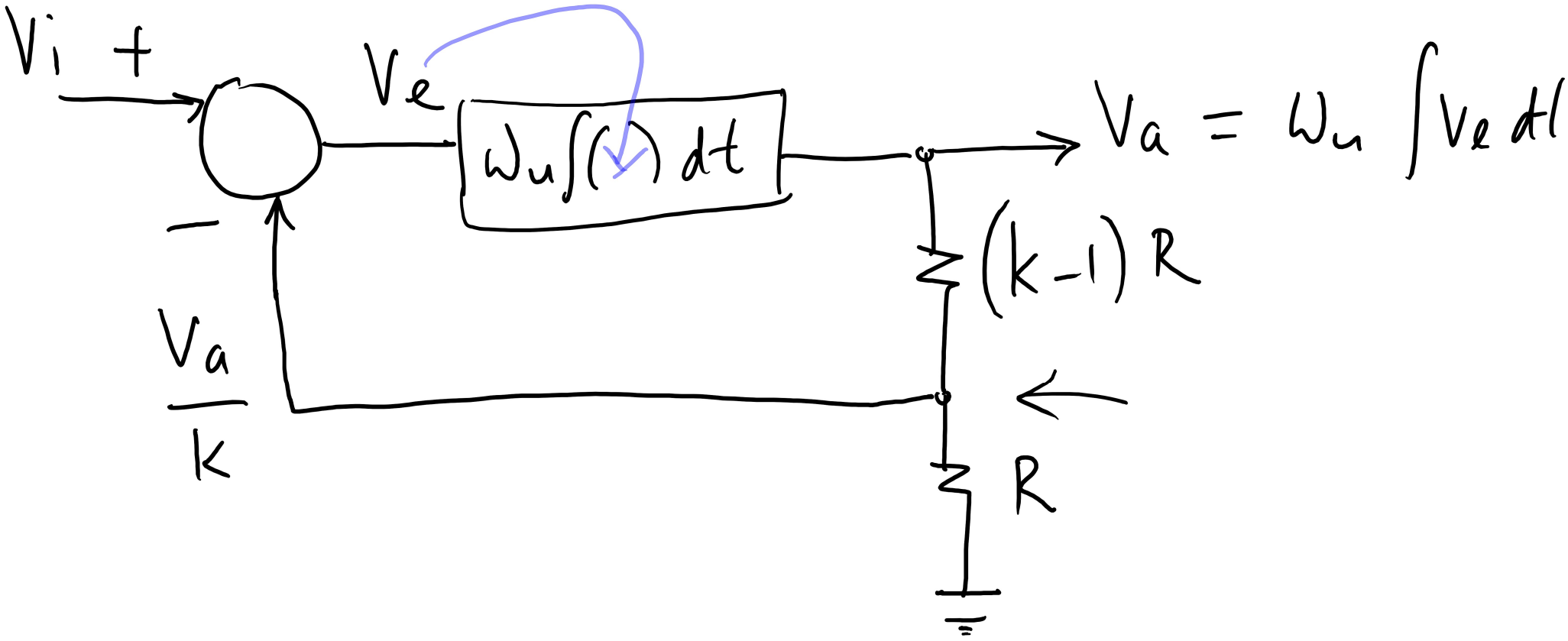
$\{V_e = 0\}$

Amplifier

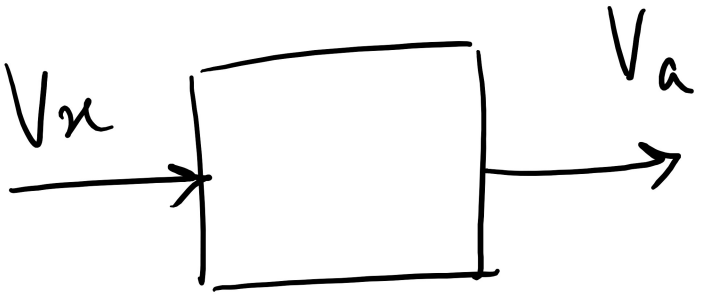
$$V_a = kV_i$$

$$V_i = \frac{V_a}{k}$$

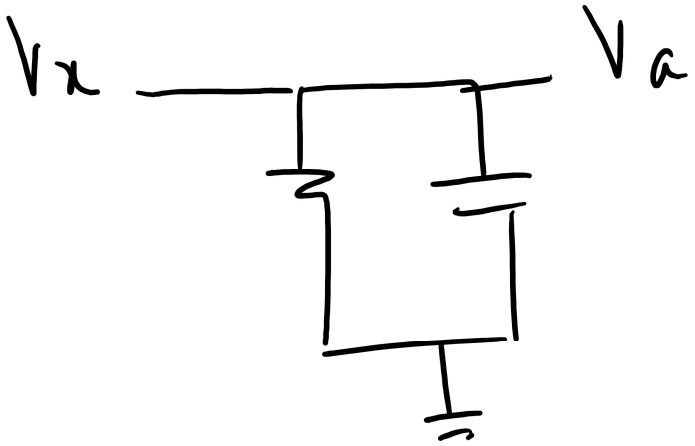
Compare

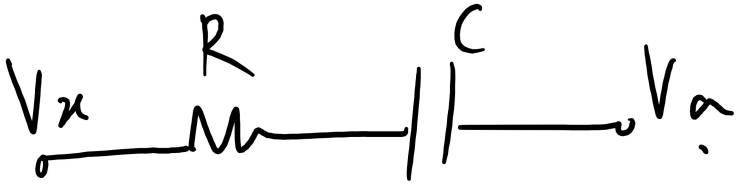


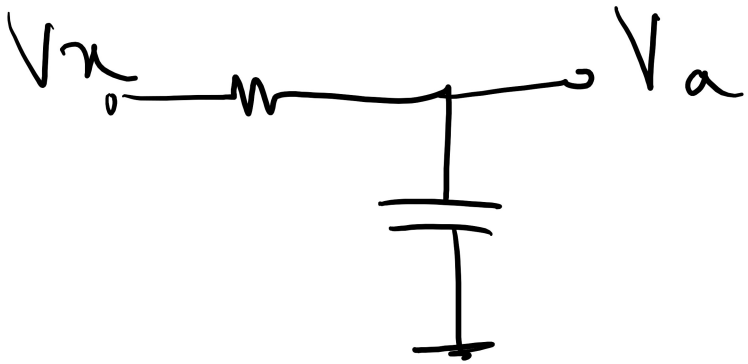
$$\frac{1}{\omega_u}\frac{dV_a}{dt} + \frac{V_a}{K} = V_i$$ ← Solution – HW (exponential)

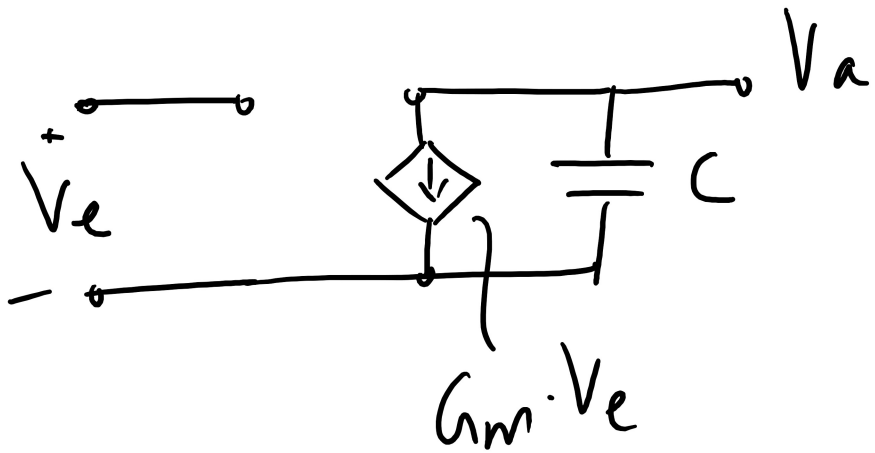


$$\omega_u \int V_x \, dt$$







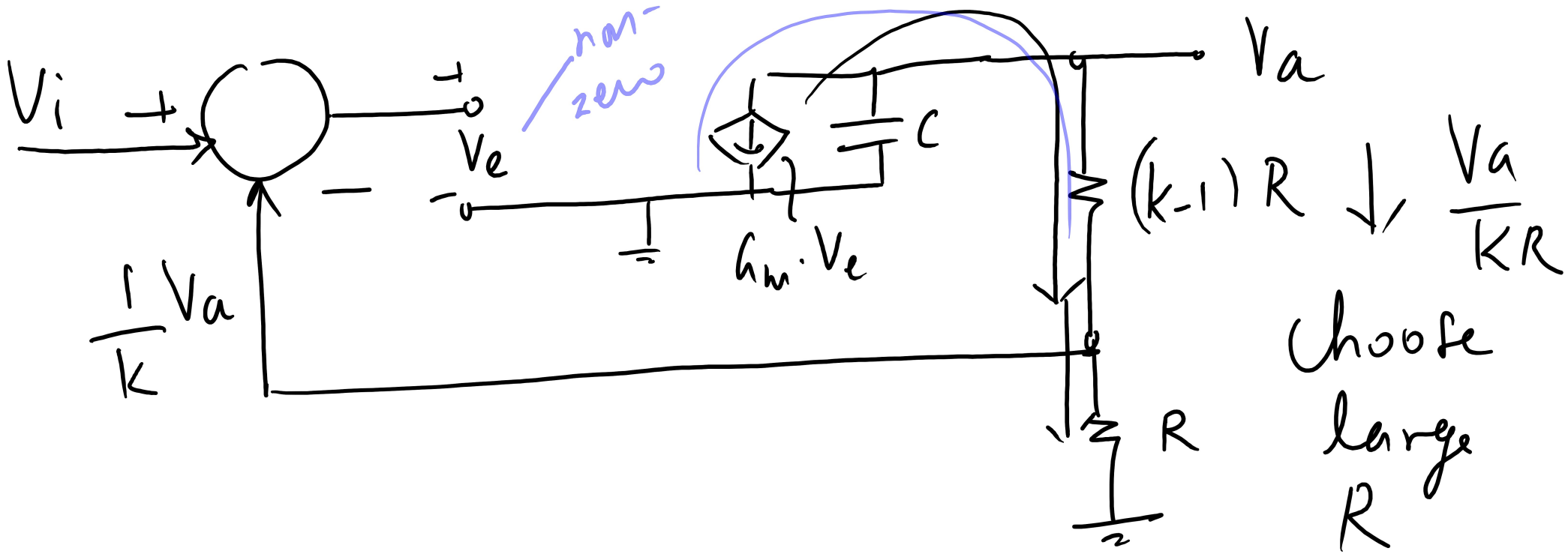


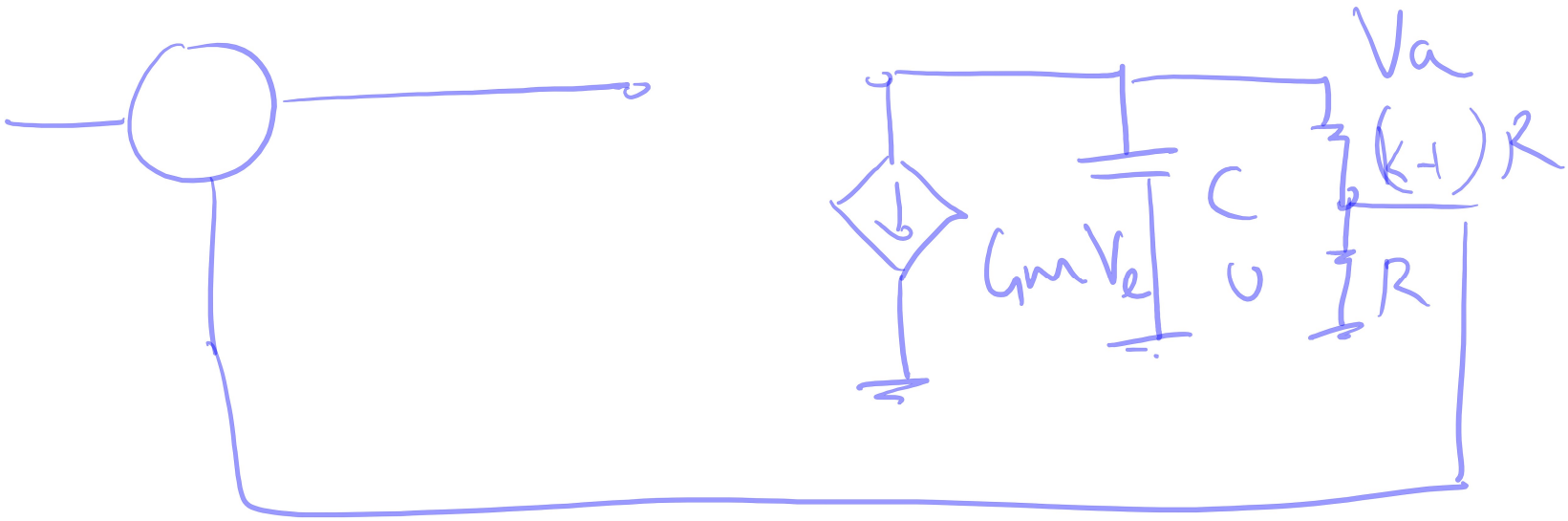
$$i_c = C\frac{dV_c}{dt}$$

$$G_m \cdot V_e = C\frac{dV_a}{dt}$$

$$V_a = \frac{G_m}{C}\int V_e\, dt$$

$\frac{G_m}{C}$ — ω_u


Vi
+
−
Ve
non-zero
C
Va
(k-1) R
Va/KR
Gm·Ve
1/k Va
R
Choose large R


Va
(k-1) R
C
GmVe
R