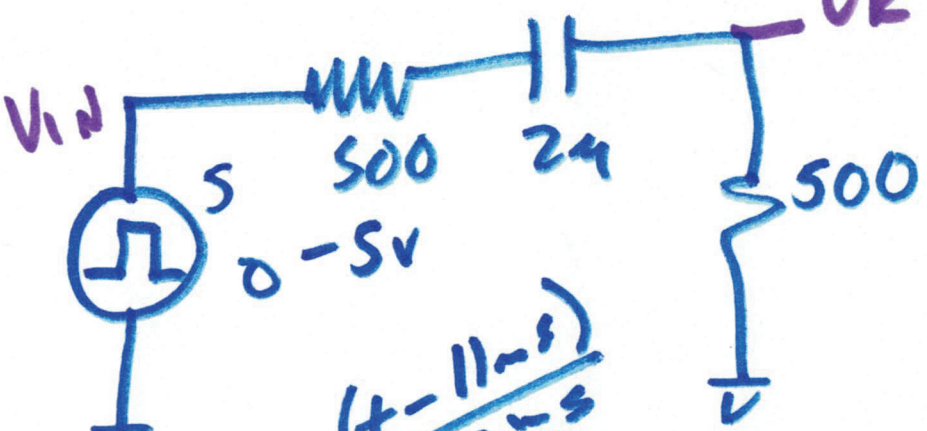
EE 220 circuits 1

i.e.
idesT
(that is)

Lecture 20

NOV. 3, 2021



$v_R = v_{IN} \cdot \frac{500}{500+500} = \frac{1}{2} v_{IN}$

$\tau = 2_4 (500 + 500)$

$= 2ms$

$v_i = -2.5$

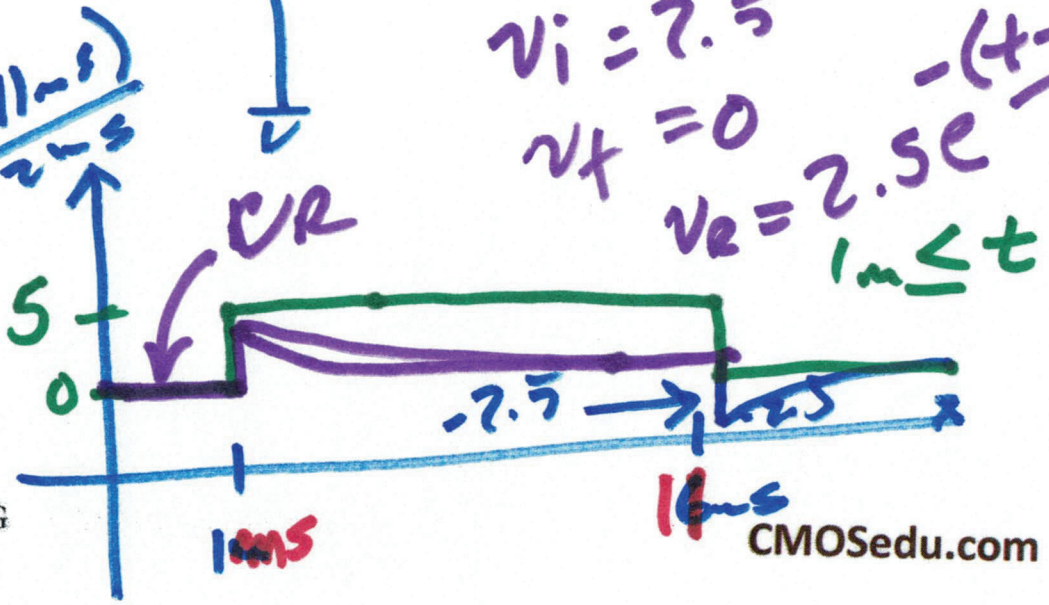
$v_f = 0$

$v_R = -2.5 e^{-\frac{(t-11ms)}{2ms}}$ $\quad 11ms \leq t$

$v_i = 2.5$

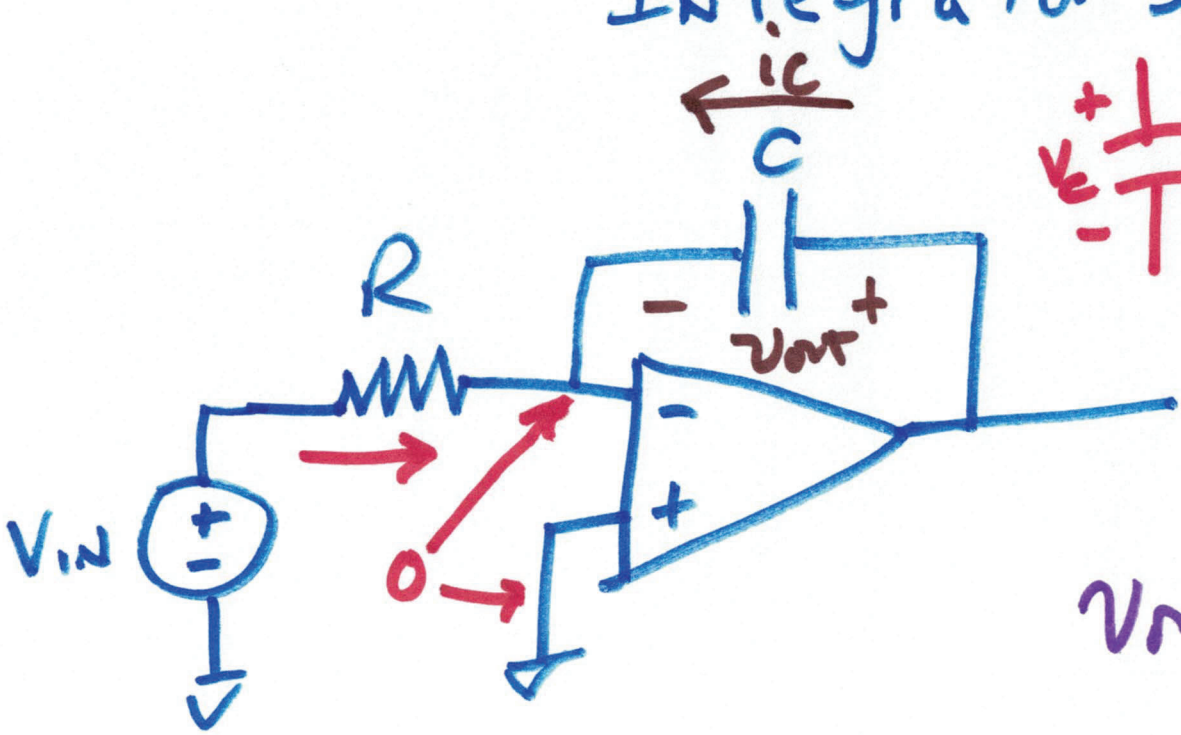
$v_f = 0$

$v_R = 2.5 e^{-\frac{(t-1ms)}{2ms}}$ $\quad 1ms \leq t \; 11ms$



1)

Integrators



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

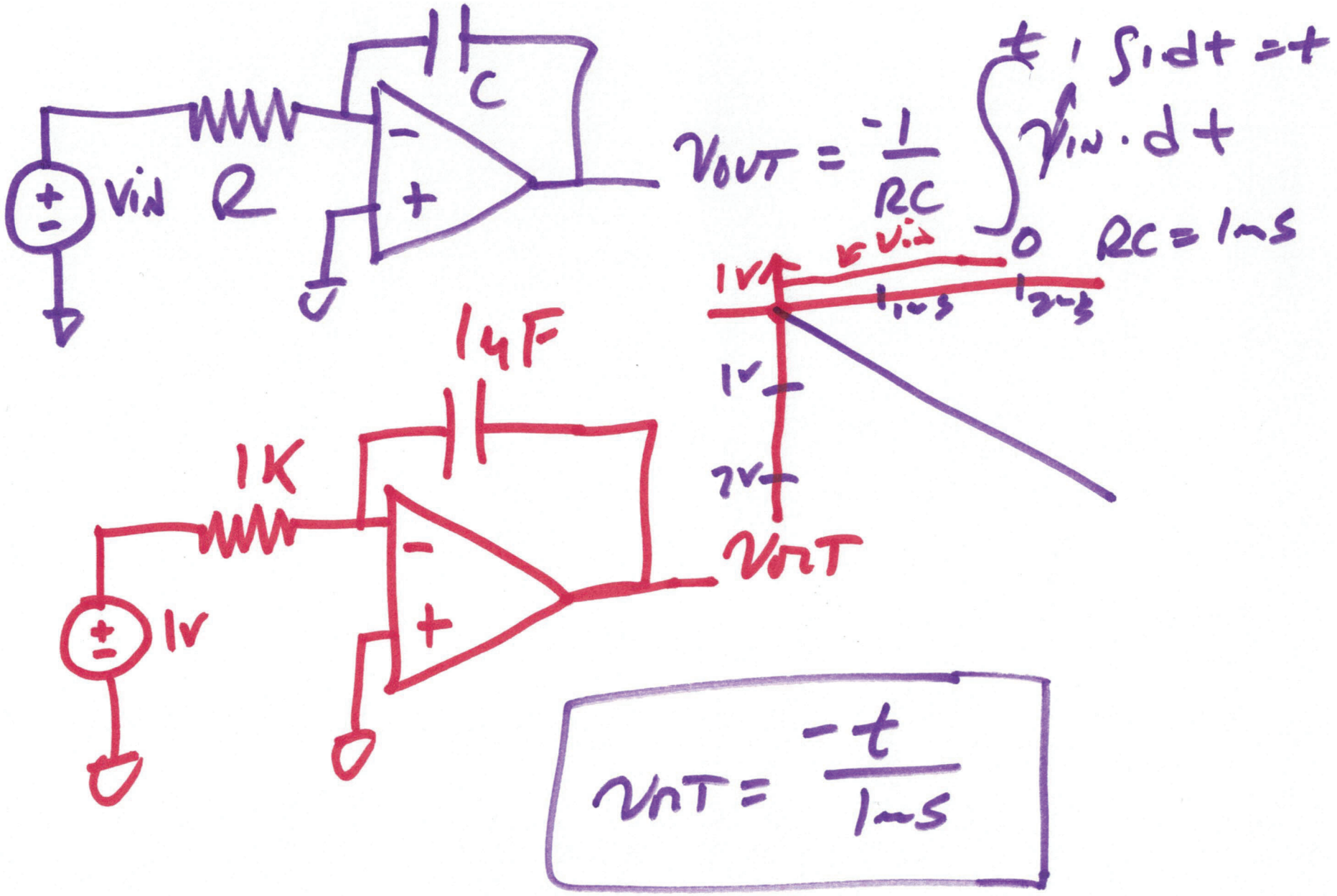
$$v = \frac{1}{C}\int i_c \cdot dt$$

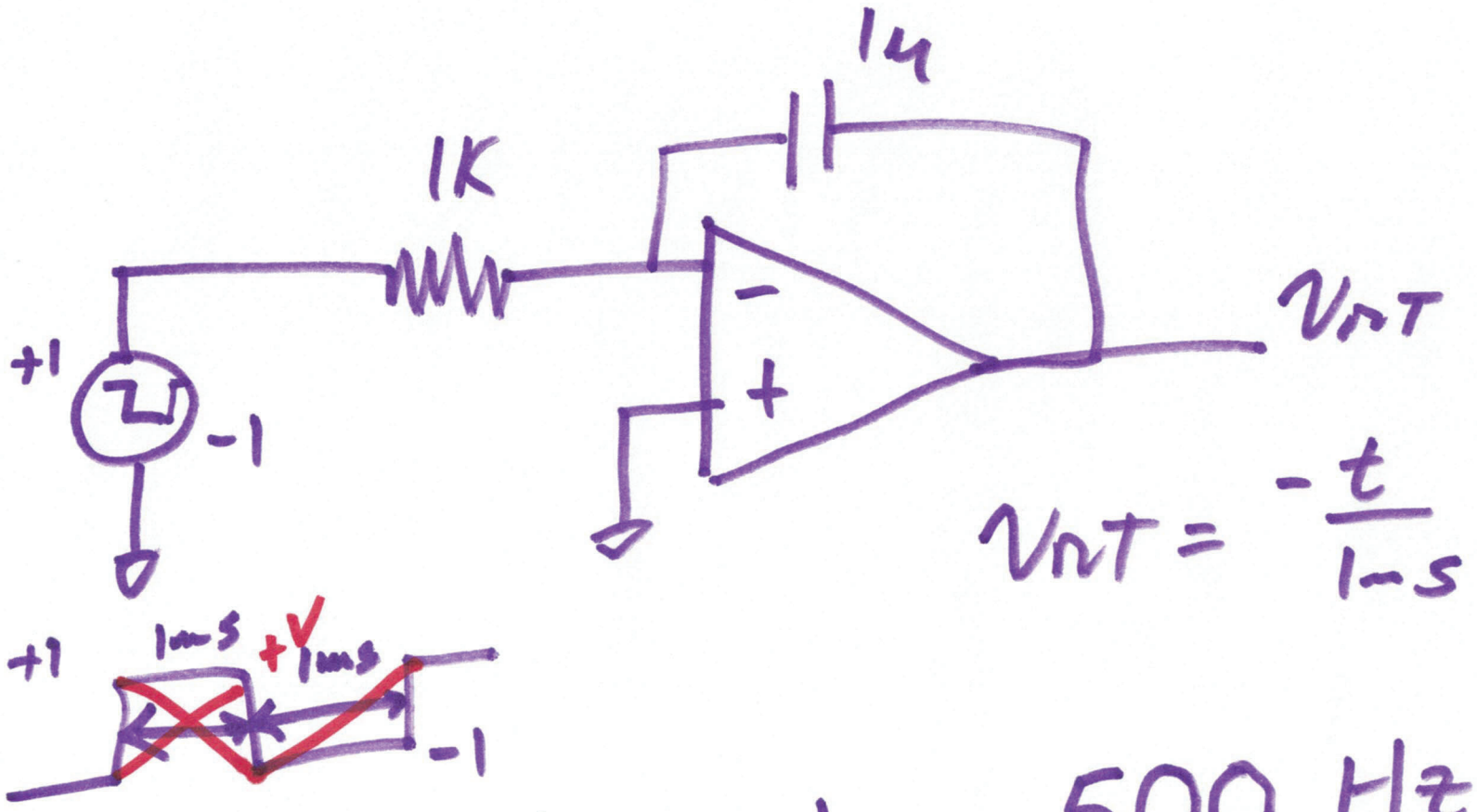
$$v_{OUT} = v_C$$

$$\frac{V_{IN} - 0}{R} + i_C = 0$$

$$\frac{v_{IN}}{R} = -i_C = -C\frac{dv_{OUT}}{dt}$$

$$v_{OUT} = -\frac{1}{RC}\int v_{IN} \cdot dt$$


C
R
Vin
$V_{OUT} = \frac{-1}{RC} \int V_{in} \cdot dt$
$\pm \frac{1}{RC} \int V_{in} \cdot dt = \pm$
RC = 1mS
0
1V
1mS
2mS
1V
2V
1μF
1K
1V
V_{OUT}
$V_{OUT} = \frac{-t}{1mS}$



$$f = \frac{1}{T} = \frac{1}{2ms} = 500\ Hz$$

4)