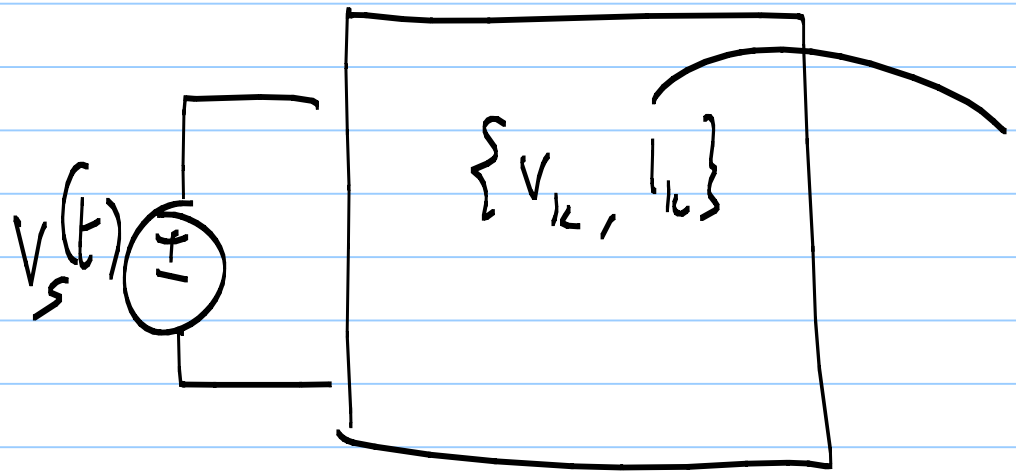
EE 2015

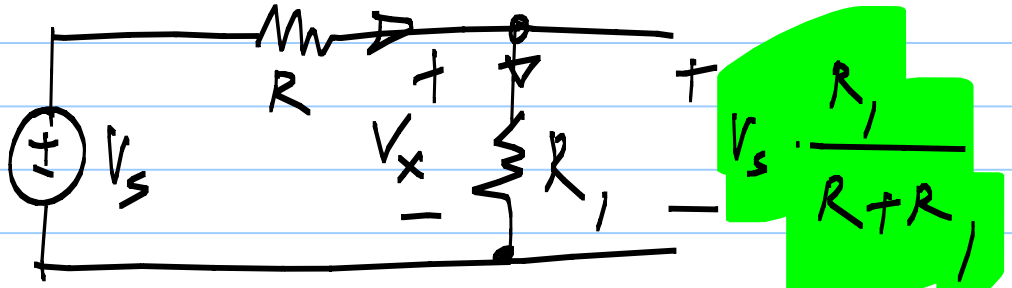
Memoryless circuits (V, I, R, contr. sources)

15/9/2017



( ) . $V_s(t)$

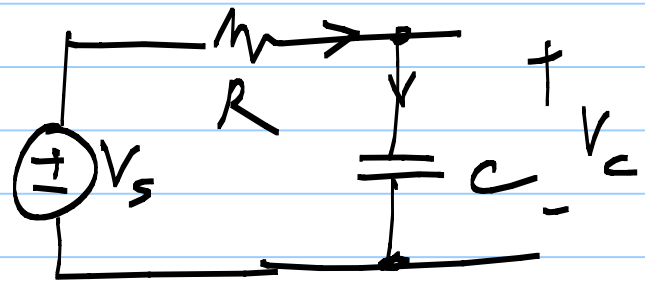
Circuits with memory elements L, C



$$V_s \cdot \frac{R_1}{R+R_1}$$

$$\frac{V_x}{R_1} = \frac{V_s - V_x}{R}$$

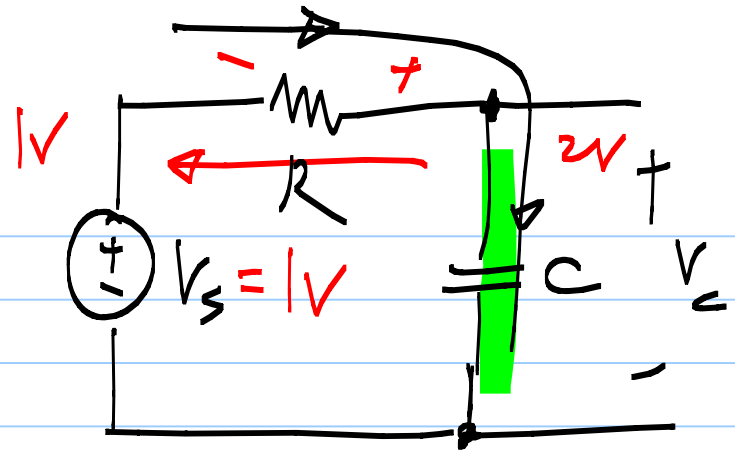
algebraic eq.



$$C\frac{dV_c}{dt} + \frac{V_c}{R} = \frac{V_s}{R}$$

differential eq.

$$RC\frac{dV_c}{dt} + V_c = V_s$$



Find $v_c(t)$, $t \geq 0$

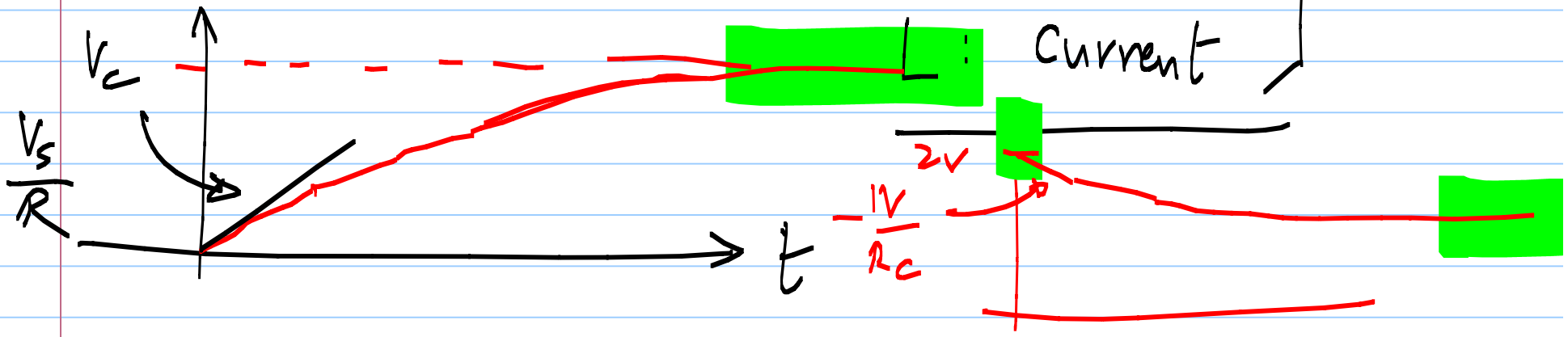
Need to specify the initial state of the memory element

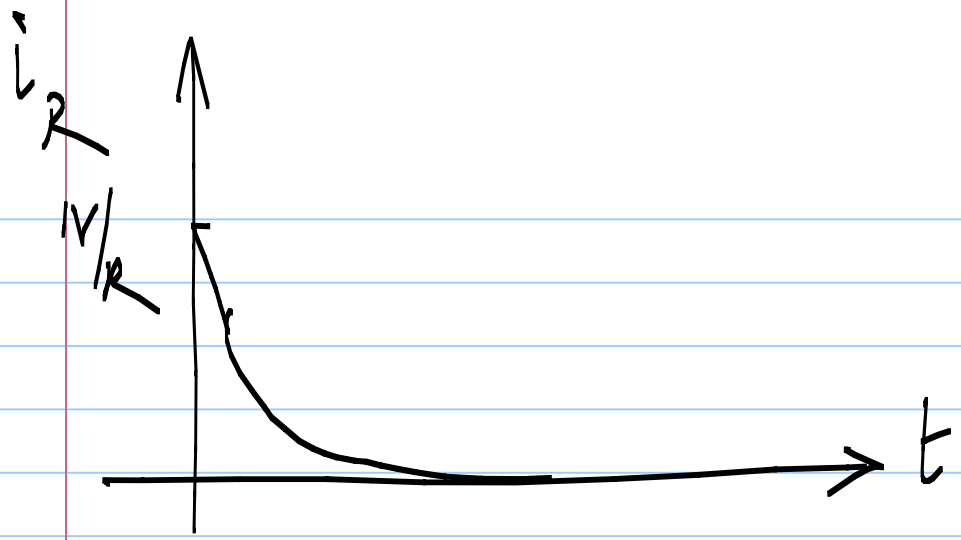
C: Voltage

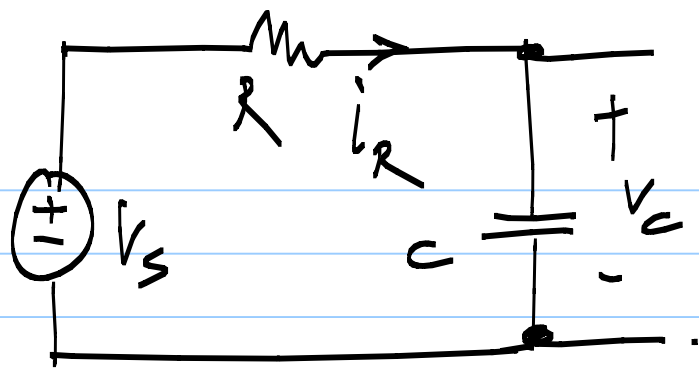
L: Current

V_s: constant $\quad i_c = \frac{V_s}{R} = C\frac{dv_c}{dt}$

$v_c(0_-) = 0V$







$V_c(0-) = 0V$

$V_s = 1V$