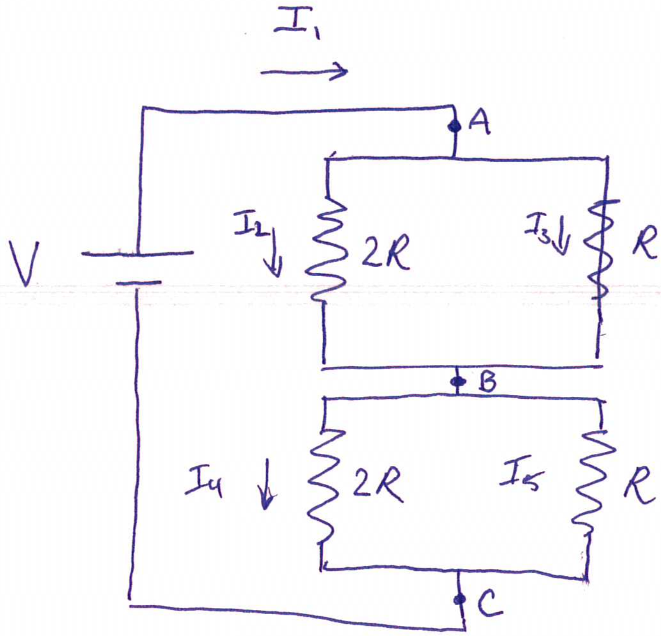


$V_{AB} = V_B - V_A$

$V_{BC} = V_C - V_A$

in ~~series~~ parallel $\Rightarrow$ same voltage drop.

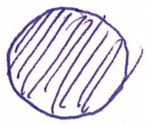
$I_2 = \dfrac{V_{AB}}{2R}$ $\qquad$ $I_4 = \dfrac{V_{BC}}{2R}$

$I_3 = \dfrac{V_{AB}}{R}$ $\qquad$ $I_5 = \dfrac{V_{BC}}{R}$

ratio is set by R's alone.

ratio is set by R's along

"conductor"



a

$$\vec{E} = \frac{\lambda}{2\pi\varepsilon_0 r}\hat{r} = \frac{Q_{inside}}{2\pi\varepsilon_0 L r}\hat{r}$$

$$V = -\int_0^r d\vec{l}\cdot\vec{E} = -\int_0^r dr\,\frac{Q_{inside}}{2\pi\varepsilon_0 L r}$$

$r < a$:

$$= 0$$

$r \geq a$:

$$= 0 - \int_a^r dr\,\frac{1}{r}\left(\;\right) = -\log\frac{r}{a}\cdot\frac{Q}{L\,2\pi\varepsilon_0}$$

<u>insulator</u>:

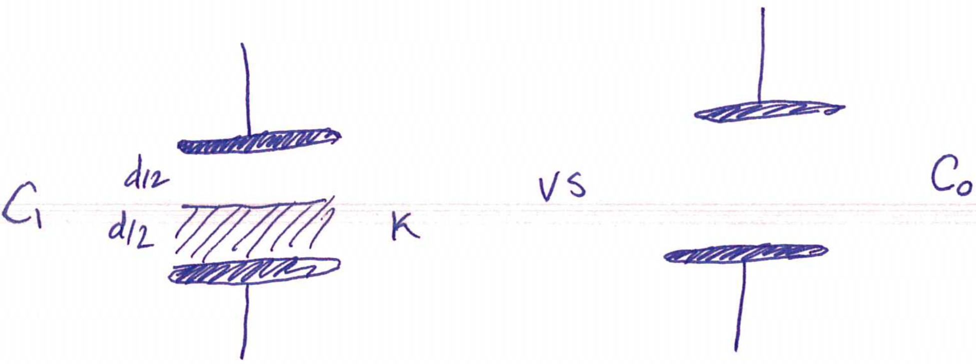
$r < a$

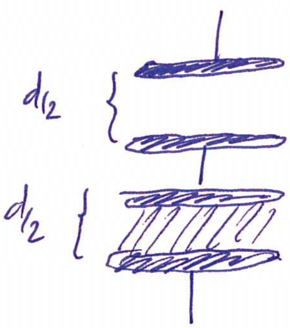
$$V = -\int_0^r \left(\frac{\cancel{\pi} r^2}{\cancel{\pi} a^2}\right)\frac{Q}{L}\,\frac{1}{2\pi\varepsilon_0}\,\frac{1}{r} = -\frac{r^2}{2a^2}\cdot\frac{Q}{L}\,\frac{1}{2\pi\varepsilon_0}$$

$$= -\frac{1}{4\pi\varepsilon_0}\,\frac{Q}{L}\,\frac{r^2}{a^2}$$

$r \geq 0$

same as conductor!



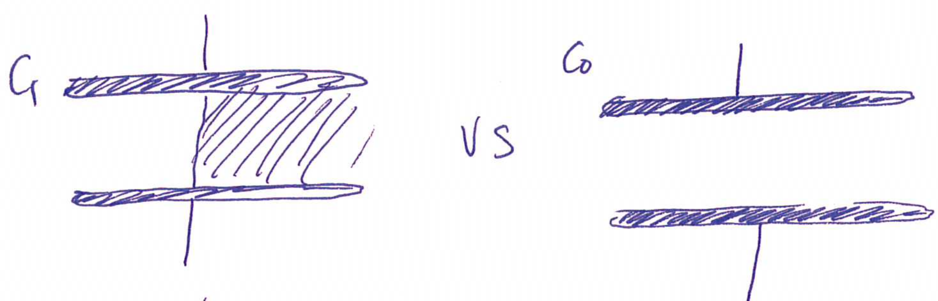


$$2C_0 = \frac{A\varepsilon_0}{d}$$

K: $2C_0K$

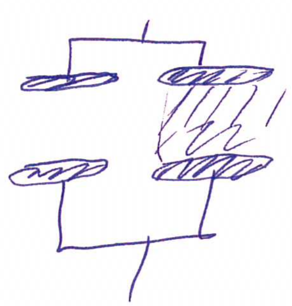
$$C_{equiv} = \left(\frac{1}{C_1} + \frac{1}{C_2}\right)^{-1} = C_0\left(\frac{K}{2K} + \frac{1}{2K}\right)^{-1}$$

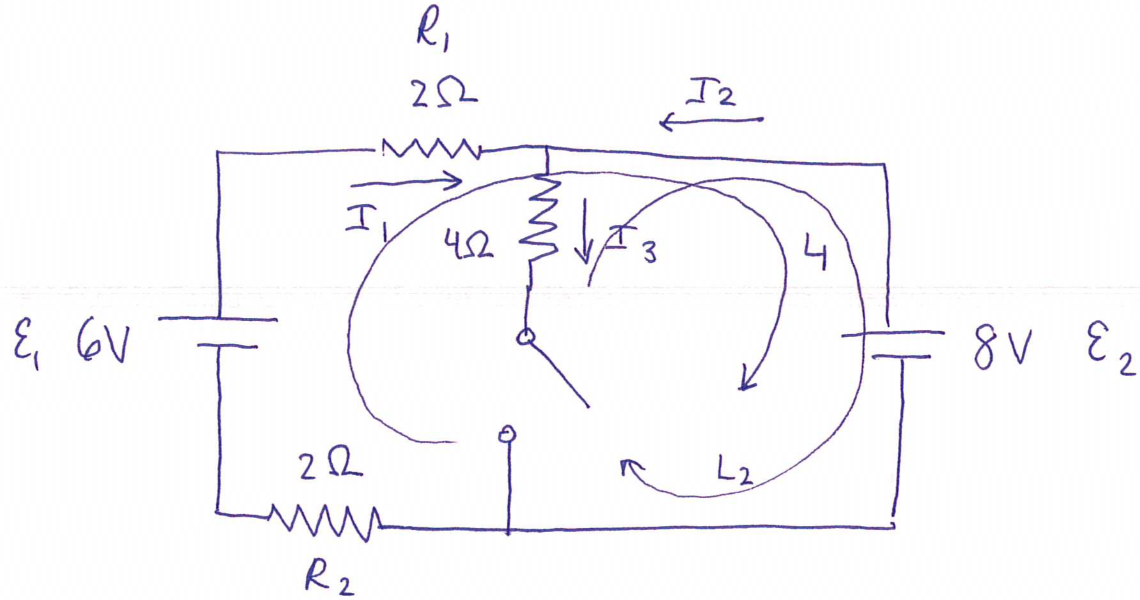
$$= C_0\frac{2K}{(1+K)}$$



$$C_1 = C_A + K\,C_A$$

$$C_1 = (1+K)\frac{C_0}{2}$$





$I_1 + I_2 = I_3$

L_1: $-\mathcal{E}_1 + I_1 R_1 + \mathcal{E}_2 + I_1 R_2 = 0$

L_2: $-R_3 I_3 + \mathcal{E}_2 = 0$

Not coupled $\Rightarrow$ it is the same.