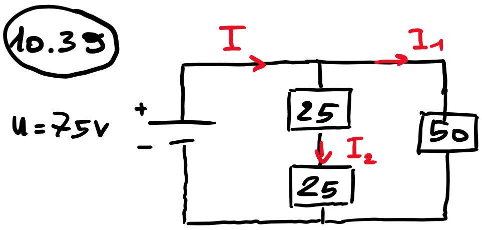
10.38 Circuit (A) : $R_S = \sum R = 358\,\Omega$ (1)

Circuit (B) : $\frac{1}{R_P} = 3 \cdot \frac{1}{R}$ R : résistance inconnue

$\Rightarrow R_P = \frac{R}{3}$ (2)

(1) = (2) : $\frac{R}{3} = 358 \Rightarrow R = 3 \cdot 358 = 1074\,\Omega$

10.39



(a). Résistance équivalente du circuit :

$$\frac{1}{R_P} = \frac{1}{50} + \frac{1}{50} = \frac{1}{25} \Rightarrow R_P = 25\,\Omega$$

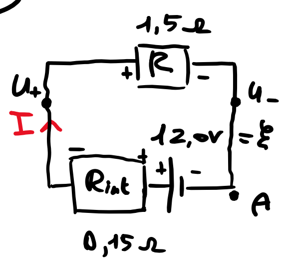
$$\Rightarrow I = \frac{U}{R} = \frac{75}{25} = 3{,}0\,A$$

(b). $I_1 = I_2$ (Même résistance dans les 2 branches)

$$I = I_1 + I_2 = 2I_1 \Rightarrow I_1 = \frac{1}{2} I = 1{,}5\,A$$

(c). On remarque que $I_2 = 1{,}5A \Rightarrow P = R I_2^2 = 25 \cdot 1{,}5^2 \cong 56{,}3\,W$

10.45



(a). On cherche $\Delta U = U_+ - U_- = \mathcal{E} - R_{int} \cdot I$

Il faut trouver I.

En appliquant Kirchhoff à la maille, de A : ⟲

$$12 - R_{int} \cdot I - RI = 0$$

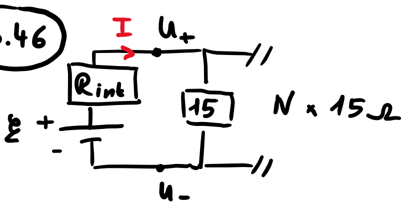
$$(R_{int} + R) I = 12 \Rightarrow I = \frac{12}{1{,}65}$$

$$\Rightarrow \Delta U = 12{,}0 - 0{,}15 \cdot \frac{12}{1{,}65} \cong 11\,V$$

(b). $P = RI^2 = 1{,}5 \cdot \frac{144}{1{,}65^2} = 79\,W$

(c). $P = R_{int} \cdot I^2 = 0{,}15 \cdot \frac{144}{1{,}65^2} = 7{,}9\,W$
dans la batterie !

10.46



$$\frac{1}{R_{équ}} = \frac{1}{R} + \frac{1}{R} + \dots + \frac{1}{R} = \frac{N}{R}$$

Que vaut N ?

- $U_+ - U_- = \Delta U = \mathcal{E} - R_{int} \cdot I = \frac{\mathcal{E}}{2} \Rightarrow \frac{\mathcal{E}}{2} = R_{int} \cdot I = \frac{1}{2} I$

$\Rightarrow I = \mathcal{E}$

- $\Delta U = \frac{\mathcal{E}}{2} = R_{équ} \cdot I = R_{équ} \cdot \mathcal{E} = \left(\frac{N}{R}\right)^{-1} \cdot \mathcal{E}$

$$\Rightarrow \frac{1}{2} = \frac{R}{N} \Rightarrow N = 2R = 2 \cdot 15 = 30$$