b) $P = \Delta V \cdot i$

$P = 27{,}4 \cdot 125$

$\boxed{P = 3{,}42 \cdot 10^3\ W}$

ou

$\boxed{P = 3{,}42\ kW}$

$\boxed{E_{1h} = P \cdot \Delta t}$

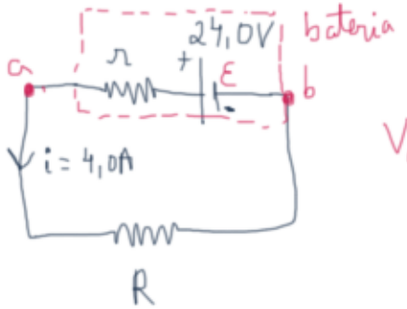
$= 3{,}42 \cdot 10^3 \cdot 3600$

$\boxed{= 1{,}23 \cdot 10^7\ J}$

$E_{1h} = 3{,}42\ kW \cdot 1h$

$\boxed{E_{1h} = 3{,}42\ KWh}$

25.32, p.161/162



$V_{ab} = V_a - V_b = 21{,}2V$

a) $r = ?$

Se começarmos a percorrer o caminho em b e terminarmos em a passando pela bateria:

$V_b + \varepsilon - r \cdot i = V_a$

$\varepsilon - ri = V_a - V_b$

$\boxed{\varepsilon - ri = V_{ab}}$

$r = \dfrac{\varepsilon - V_{ab}}{i} \rightarrow \boxed{r = \dfrac{24{,}0 - 21{,}2}{4{,}0} = 0{,}70\Omega}$

b) $R = ?$

Começando em a:

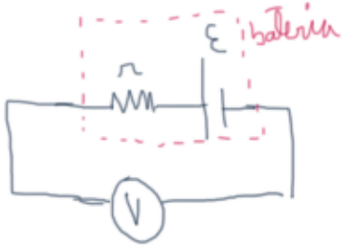
$V_a - Ri + \varepsilon - ri = V_a$

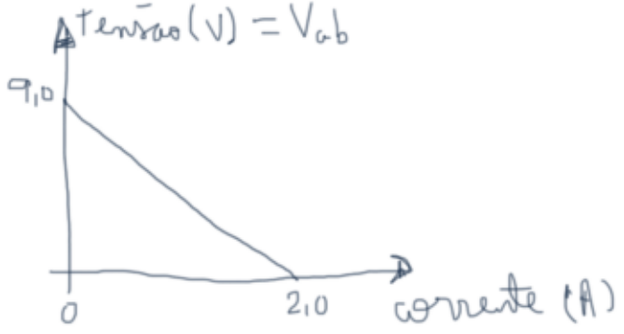
$-Ri + \varepsilon - ri = 0$

$R = \dfrac{\overset{21{,}2}{\varepsilon - ri}}{i} = \dfrac{21{,}2}{0{,}70}$

$\boxed{R = 5{,}3\Omega}$

25.33, p.162





a) $\varepsilon = ?$

$V_{ab} = \varepsilon - r i$

ε: coef. linear

r: coef. angular

$\boxed{\varepsilon = 9{,}0\ V}$

ou

$i = 0\ A \rightarrow V_{ab} = \varepsilon - r \cdot 0$

$V_{ab} = \boxed{\varepsilon = 9{,}0\ V}$

b) $r = ?$

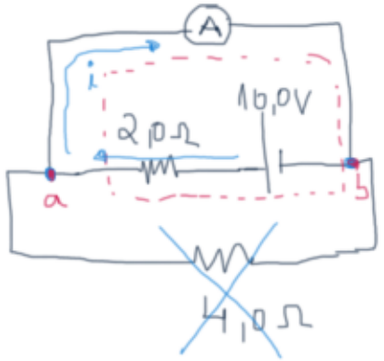
$V_{ab} = \varepsilon - r i$

$i = 2{,}0\ A \rightarrow V_{ab} = 0 = 9{,}0 - r \cdot 2{,}0$

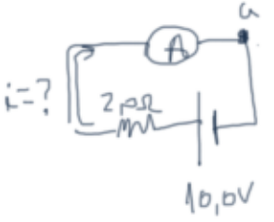
$\boxed{r = 4{,}5\ \Omega}$

$\boxed{V_{ab} = 9{,}0 - 4{,}5\, i}$

25.34, p.162



a) Amperímetro ideal : resistência interna = 0



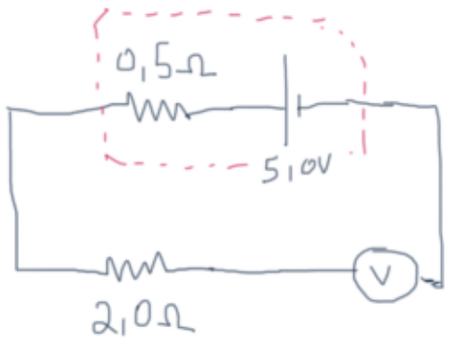
$+10{,}0 - 2{,}0\, i = 0$

$\boxed{i = 5{,}0\ A}$ //

b) $\boxed{i = 0\ A}$

c) $V_{ab} = 0 = \varepsilon - r i = 0$

25.35, p.162



a) $i = \dfrac{\mathcal{E}}{R+r} \rightarrow i = \dfrac{\mathcal{E}}{R+r+R_V} = 0$

Voltímetro ideal: resistência interna $= \infty$ (R_V)

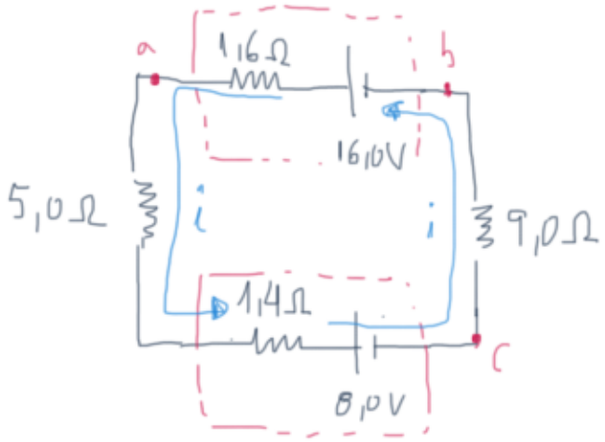
Resp: a corrente no resistor de 2,0Ω é zero.

b) $V_{ab} = \mathcal{E} - ri$

$$\boxed{V_{ab} = \mathcal{E} = 5,0V}$$

c) Não havendo corrente, a tensão lida no voltímetro é a própria f.e.m. da bateria, ou seja, 5,0V.

25.36



a) $i = ?$ (módulo e sentido)

SENTIDO = ANTI-HORÁRIO

Começando em b:

$$+16,0V - 1,6i - 5,0i - 1,4i - 8,0 - 9,0i = 0$$

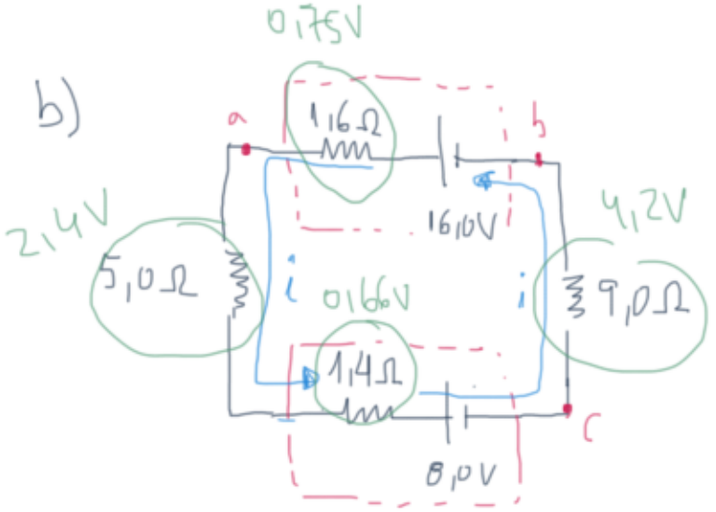
$$\boxed{i = 0,47A}$$

Por considerações energéticas:

$$i \cdot 16,0 - i^2 \cdot 1,6 - i^2 \cdot 5,0 - i^2 \cdot 1,4 = i \cdot 8,0 - i^2 \cdot 9,0 = 0$$

$$i = 0,47A$$

b)



$V_b + 16,0 - 1,6 \cdot 0,47 = V_a$

$16,0 - 1,6 \cdot 0,47 = V_a - V_b = V_{ab}$

$\boxed{V_{ab} = 15V}$

ou:

$V_a - 5,0 \cdot 0,47 - 1,4 \cdot 0,47 - 8,0 - 9,0 \cdot 0,47 = V_b$

$V_a - V_b = 8,0 + 0,47(5,0 + 1,4 + 9,0)$

$\boxed{V_{ab} = 15V}$

c) $V_{ac} = V_a - V_c = ?$

$V_a - 5,0 \cdot 0,47 - 1,4 \cdot 0,47 - 8,0 = V_c$

$V_a - V_c = V_{ac} = 8,0 + 0,47(5,0 + 1,4)$

$\boxed{V_{ac} = 11V}$

d) Começando em b: