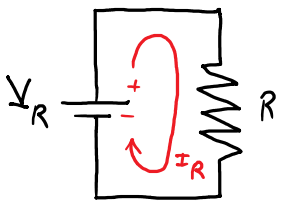
P 1.1



$V_R = 6V$

$R = 30\Omega$

a) $R = \frac{V_R}{I_R} \Leftrightarrow I_R = \frac{V_R}{R} = 200mA$

b) $P = V_R \cdot I_R = 1,2\,W$ $P > 0 \Rightarrow$ absorve energia

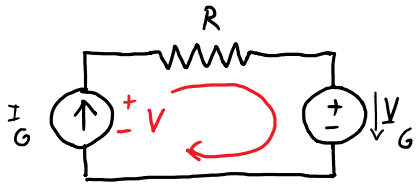
c) $P = V_R \cdot (-I_R) = -1.2W$ $P < 0 \Rightarrow$ fornece energia

Nota: I_R tem o sinal de menos, pois está a sair pelo polo positivo da fonte, mas pela convenção a corrente devia estar a entrar pelo positivo, logo temos de mudar o sinal de forma a ter a corrente a entrar pelo maio!

d) Potência fornecida $= 1.2W = 1.2\,J/s$

Logo $1.2 \cdot 30 \cdot 6 = 2.16\,KJ$ Energia fornecida em 30 min

P 1.2



$I_G = 1A$ a) $V = V_R + V_G = I_G \cdot R + V_G = 20V$

$V_G = 10V$ b) $P = I_G \cdot (-V) = -20W$

$R = 10\Omega$ c) A fonte de corrente está a fornecer

A fonte de tensão está a absorver

P 1.3

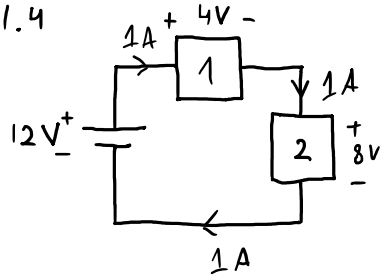
a) $A = \frac{C}{s} \Rightarrow$ Capacidade $= 50Ah \cdot 60 \cdot 60 = 180\,KC$

b) $\frac{180\,KC}{12A} = 15\,000\,s \Rightarrow 250$ min $\Rightarrow$ 4 horas e 10 minutos

c) $\frac{180\,KC}{24 \cdot 60 \cdot 60\,s} = 2.08(3)\,A$

P 1.4

a)

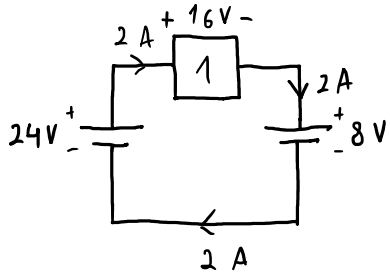


$P_{fonte} = -1 \cdot 12 = -12W$

$P_1 = 1 \cdot 4 = 4W$

$P_2 = 1 \cdot 8 = 8W$

b)

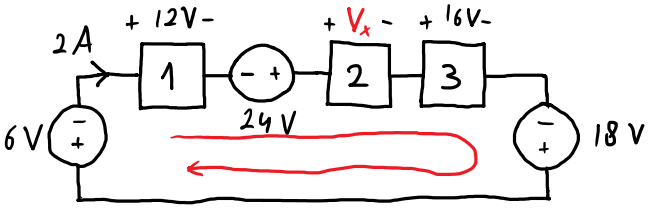


$P_{fonte_{24V}} = -2 \cdot 24 = -48W$

$P_{fonte_{8V}} = 2 \cdot 8 = 16W$

$P_1 = 2 \cdot 16 = 32W$

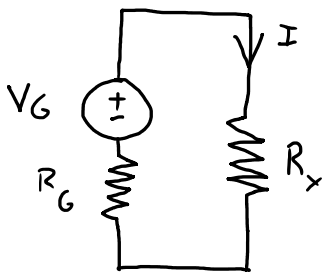
P 1.5



$6 + 12 + V_x + 16 = 24 + 18 \Leftrightarrow$

$\Leftrightarrow V_x = 8V$

P 1.6



$V_G = 110\,V$

$R_G = 5\,\Omega$

$I = 5\,A$

b) $R = \frac{V}{I} \Rightarrow R_T = \frac{V_G}{I} = 22\,\Omega$

c) $R_T = R_G + R_x \Leftrightarrow R_x = 22 - 5 = 17\,\Omega$

d) $P = V \cdot I = R I^2 = 17 \cdot 5^2 = 425\,W$