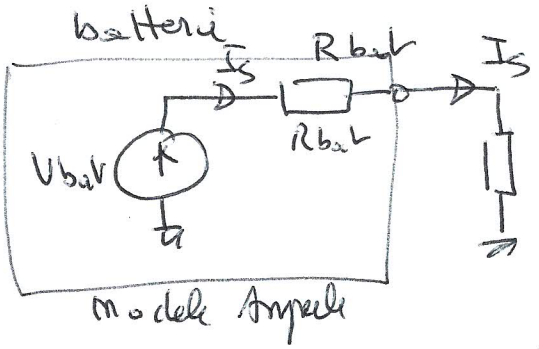
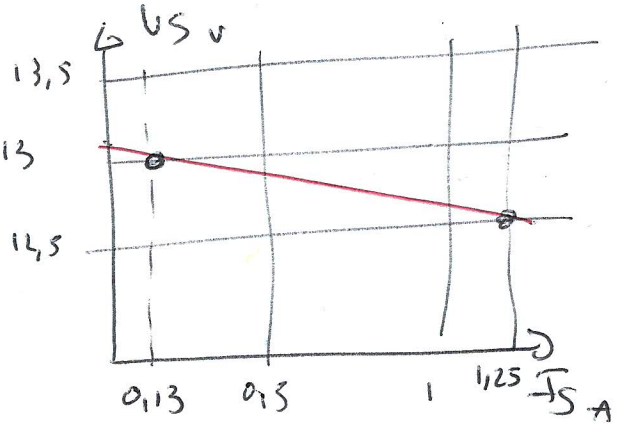
Correction Problème 1 ex 1

problème batterie branchée sur ampoule 12v 24W



Rc ≈ Ampoule



Q1) calcul R bat

Rappel $Vs = Vbat - Rbat\ Is$

$\frac{dVs}{dIs} = -Rbat = \frac{y_2 - y_1}{x_2 - x_1}$

si Rc = 100Ω Vs = 13v $I = \frac{U}{R} = 0,13$

si Rc = 10Ω Vs = 12,5 I = 1,2 A

$-R_{bat} = \frac{dVs}{dIs} = \frac{12,5 - 13}{1,25 - 0,13} = \frac{-0,5}{1,12} = -Ri \triangleq \frac{-0,5}{1} \simeq -0,5\ \Omega$

$-Rbat = -0,5$ **Rbat = 0,5**

Calcul Vbat avec 100Ω $Vs = Vbat - 0,5 \times 0,13$

$Vbat = 13v + (0,5 \times 0,13) = 13,05\ V$

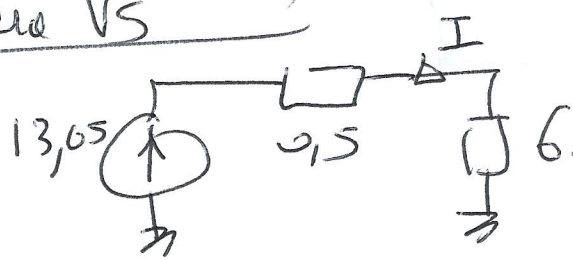
$\simeq 0,5 \times 0,1 = 0,05$

Q2) Resistance Ampoule

$P = \frac{U^2}{R}$ $\frac{U^2}{P} = R$ $U = 12$ $P = 24$

$\frac{12 \times 12}{2 \times 12} = 6\Omega$

Q3) quel sera Vs



$Vs = I\ Rc$ ← 6

$I = \frac{13,05}{0,5 + 6}$

$Vs = 13,05 \times \frac{6}{0,5+6}$ ok

$Vs = 12,5\ v$ environ