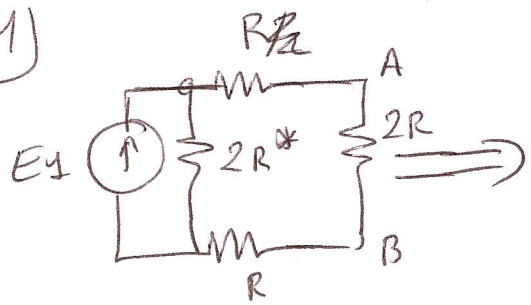
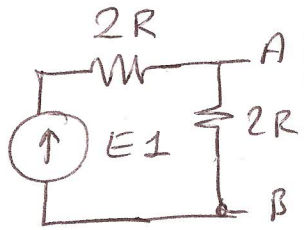
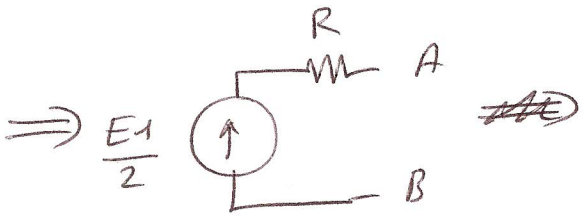
DS du 24/2/2015

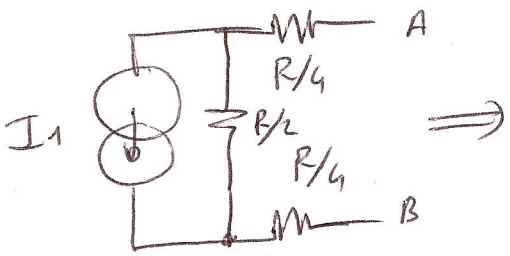
1)

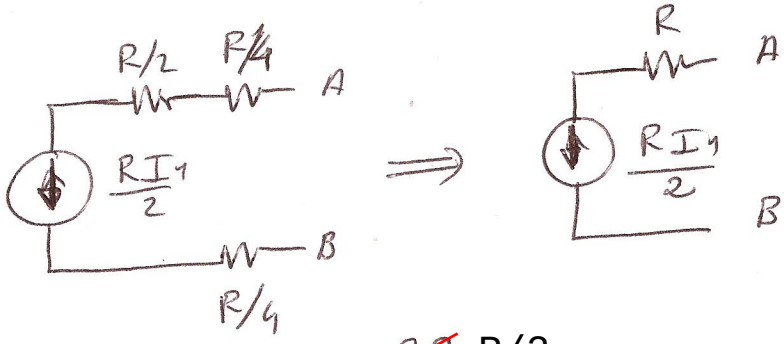


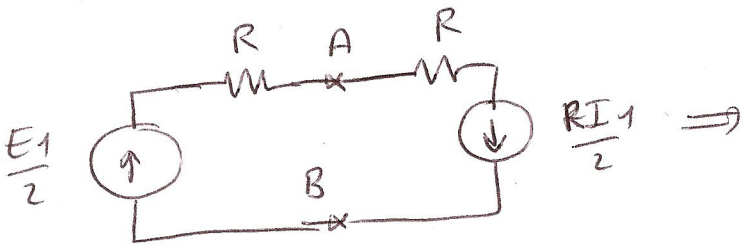


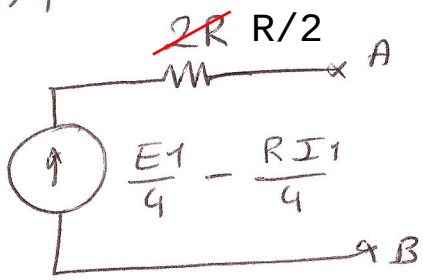
* n'intervient pas car E1 source idéale











2)

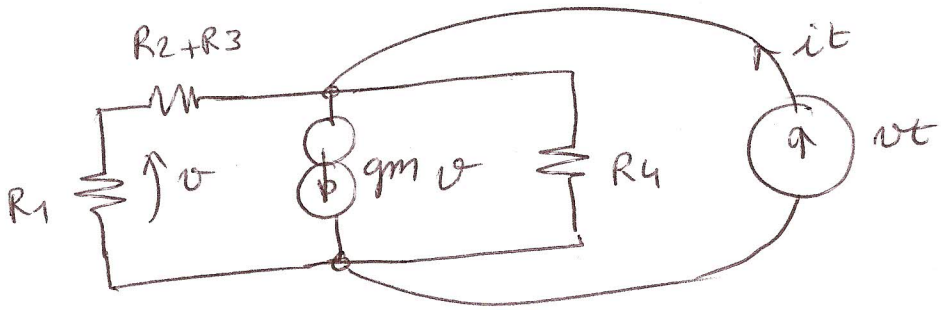
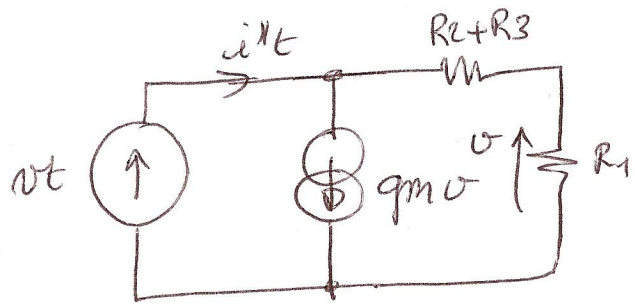


Schéma pour calculer Zeq



$$Zeq = R4 \,//\, \frac{vt}{i't}$$

$$i't = gm\,v + \frac{vt}{R_1+R_2+R_3}$$

$$v = vt\,\frac{R_1}{R_1+R_2+R_3}$$

$$i't = vt\,\frac{(1+gm\,R_1)}{R_1+R_2+R_3}$$

$$Z_{eq} = R_4 \,//\, \frac{R_1+R_2+R_3}{1+gm\,R_1} \approx 33{,}2\,\Omega$$

$1{,}4k$ $\qquad \frac{1{,}4k}{1+40} \simeq 34\Omega$

3)

$$V_S = \left(1+\frac{R_4}{R_3}\right)\left(\frac{-R_2}{R_1}\right)V_{e1} + \left(1+\frac{R_2}{R_1}\right)V_{e2}$$

il faut le même gain pour V_{e1} et V_{e2}

$$\left(1+\frac{R_4}{R_3}\right)\left(\frac{R_2}{R_1}\right) = 1+\frac{R_2}{R_1}$$

$$\frac{R_4}{R_3}\,\frac{R_2}{R_1} = 1 \qquad \cancel{\frac{R_4}{R_3}\,\frac{R_1}{R_2}}$$

or $\frac{R_2}{R_1} = 9$ (car $1+\frac{R_2}{R_1} = 10$)

$R_2 = 9k\Omega$

donc $\frac{R_3}{R_4} = 9$ $\qquad R_4 = \frac{R_3}{9} = 1{,}11k\Omega$

4) R_1 n'intervine pas car E1 sunt de tensiuni ideale