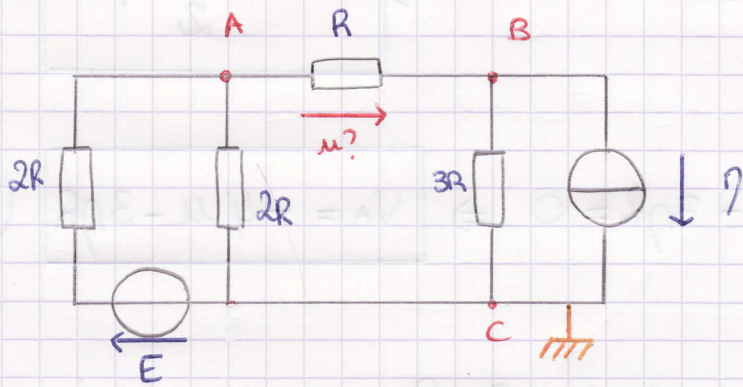


EX_E2_19

A.N: $E = 5V$

$R = 5\Omega$

$\eta = 0,2A$

1) DEMO PAR ASSOCIATION ET TRANSFORMATION NORTON-TH

2) Application de LNTP

- choix de la masse : en C.

LNTP en A

$$\frac{V_C - V_A + E}{2R} + \frac{V_C - V_A}{2R} + \frac{V_B - V_A}{R} = 0$$

$$\hookrightarrow -V_A + E - V_A + 2V_B - 2V_A = 0$$

$$\boxed{-4V_A + 2V_B + E = 0} \quad (1)$$

LNTP en B

$$\frac{V_A - V_B}{R} + \frac{V_C - V_B}{3R} + (-\eta) = 0$$

$$\hookrightarrow 3V_A - 3V_B - V_B - 3\eta = 0$$

$$\boxed{3V_A - 4V_B - 3\eta = 0} \quad (2)$$

$$\text{OR } u \equiv u_{BA} = V_B - V_A$$

$$\text{dans (1)} \quad 2u - 2V_A + E = 0 \Rightarrow V_A = \frac{E}{2} + u \quad (*)$$

$$\text{dans (2)} \quad -4u - V_A - 3\eta R = 0 \Rightarrow V_A = -4u - 3\eta R \quad (**)$$

$$(*) \text{ et } (**): \quad \frac{E}{2} + u = -4u - 3\eta R$$

$$5u = -\frac{E}{2} - 3\eta R$$

$$u = -\frac{E}{10} - \frac{3\eta R}{5}$$

$$u = -1,1V$$

Rq: Application du Th de Millman.

$$\text{em A} \quad V_A = \frac{V_C + E}{2R} + \frac{V_C}{2R} + \frac{V_B}{R} = \frac{E + 2V_B}{2R} \Big/ \frac{1}{2R} + \frac{1}{2R} + \frac{1}{R} = \frac{4}{2R}$$

$$\text{On retrouve (1)} \quad 4V_A = E + 2V_B$$

$$\text{em B} \quad V_B = \frac{V_A}{R} + \frac{V_C}{3R} \quad -? \quad = \frac{V_A - \eta R}{R} \Big/ \frac{1}{3R} + \frac{1}{R} = \frac{3V_A - 3\eta R}{4}$$

$$\text{On retrouve (2)} \quad 4V_B = 3V_A - 3\eta R$$