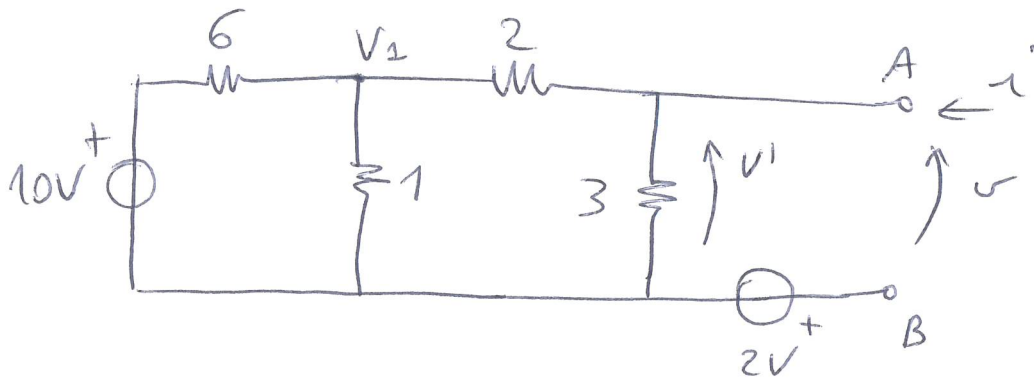
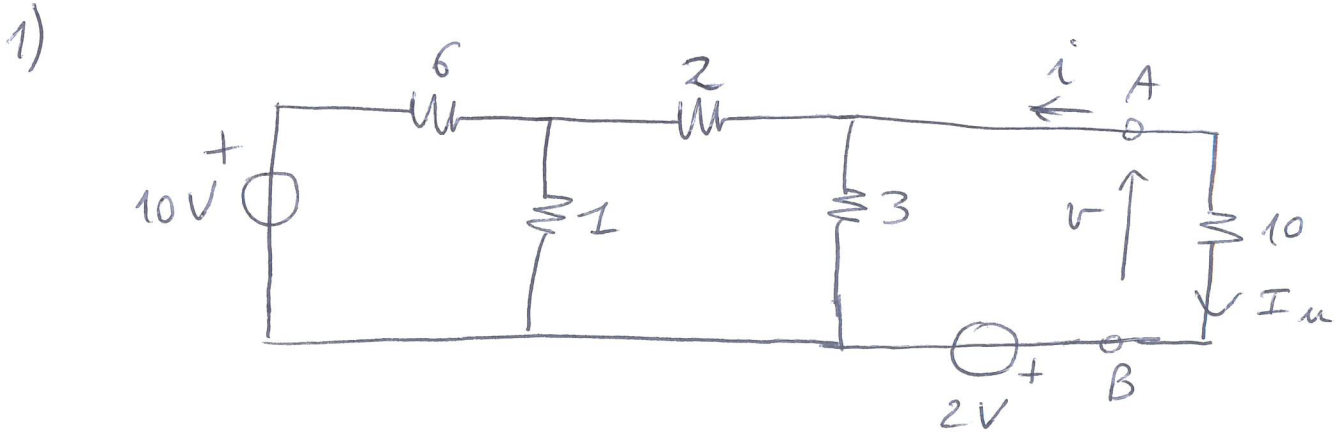


# THEVENIN - NORTON



$$R_{eq} \Rightarrow R_{p1} = 6 \parallel 1 = \frac{6}{7} \Omega$$
$$R_{s1} = \frac{6}{7} + 2 = \frac{20}{7} \Omega$$
$$R_{eq} = \frac{20}{7} \parallel 3 = \frac{60}{41} = 1.46 \Omega$$

$$V_{eq} \Rightarrow V' = \frac{3}{5} V_1$$

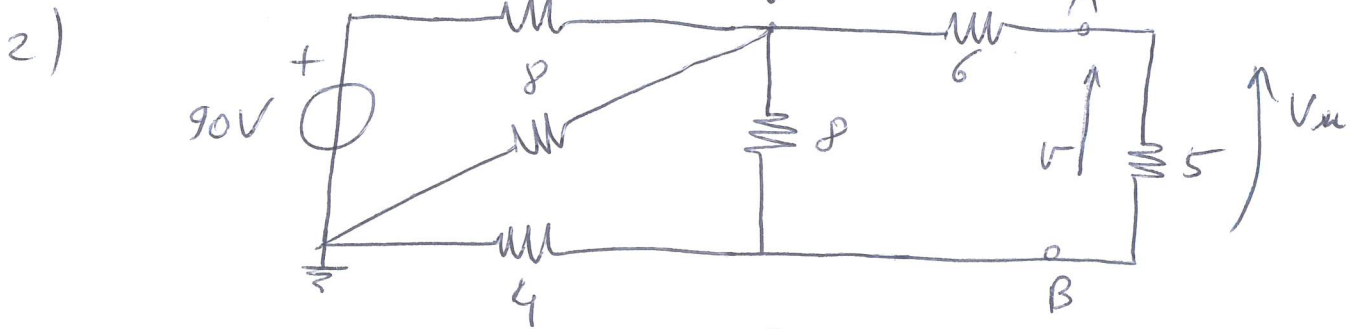
$$V_1 = \frac{(1 \parallel 5)}{6 + (1 \parallel 5)} 10 = \frac{50}{41} \text{ V}$$

$$V' = \frac{30}{41} \text{ V} \Rightarrow V_{eq} = V' - 2 = -\frac{52}{41} \text{ V}$$

$$I_{eq} \Rightarrow V_{eq} = R_{eq} \cdot I_{eq} \rightarrow I_{eq} = \frac{-\frac{52}{41}}{\frac{60}{41}} = -\frac{52}{60} \text{ A}$$

$$I_n = \frac{V_{eq}}{R_{eq} + 10} = -75.6 \text{ mA}$$

# THEVENIN - NORTON



$$R_{eq} \Rightarrow \{ [8 \parallel 8 + 4] \parallel 8 \} + 6 =$$

$$\{ 8 \parallel 8 \} + 6 = 10 \Omega$$

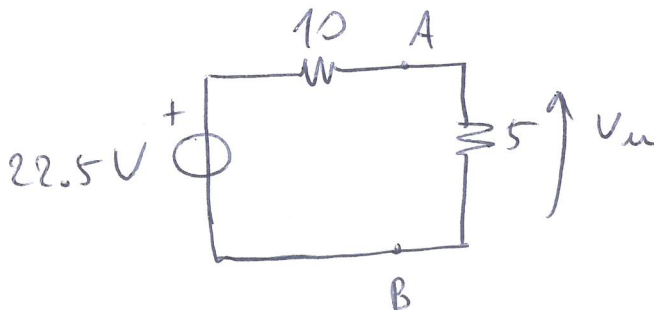
$$V_{eq} \Rightarrow V_{eq} = \frac{8}{4+8} V' = \frac{2}{3} V'$$

$$R_p = 12 \parallel 8 = \frac{24}{5} \Omega$$

$$V' = \frac{24/5}{24/5 + 8} 90 = \frac{135}{4} = 33.75 V$$

$$V_{eq} = \frac{2}{3} \frac{135}{4} = \frac{45}{2} = 22.5 V$$

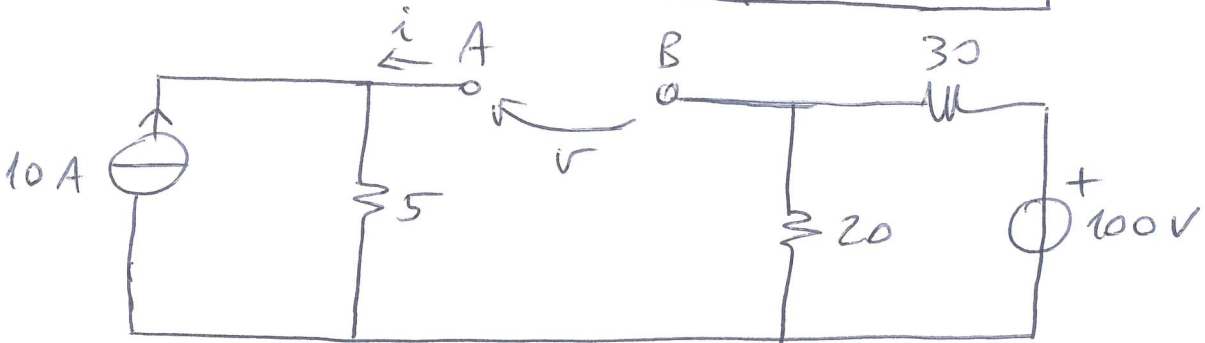
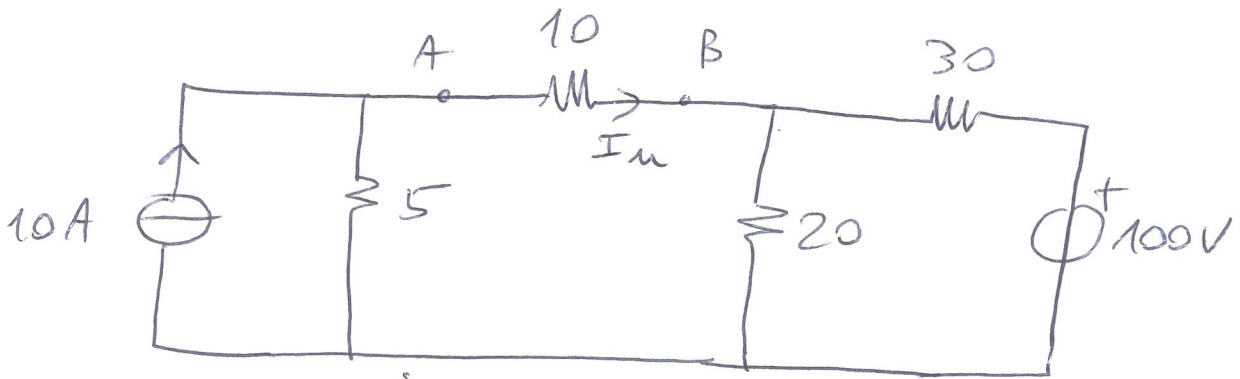
$$I_{eq} \Rightarrow I_{eq} = \frac{V_{eq}}{R_{eq}} = 2.25 A$$



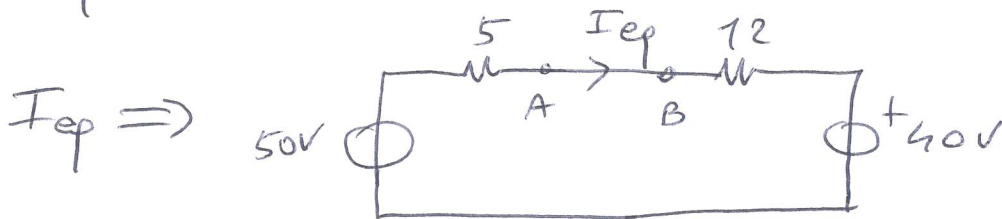
$$V_m = \frac{5}{5+10} 22.5 = 7.5 V$$

# THEVENIN - NORTON

7)

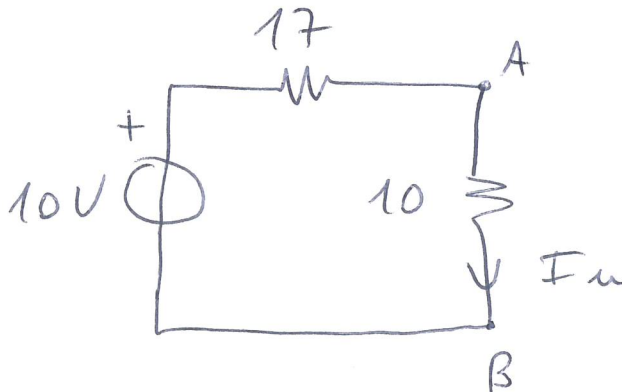


$$R_{eq} \Rightarrow R_{eq} = 5 + 20 // 30 = 17 \Omega$$



$$I_{eq} = \frac{50 - 40}{5 + 12} = \frac{10}{17} A$$

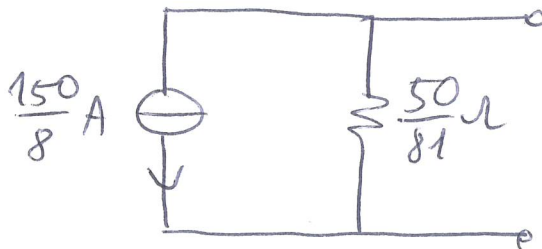
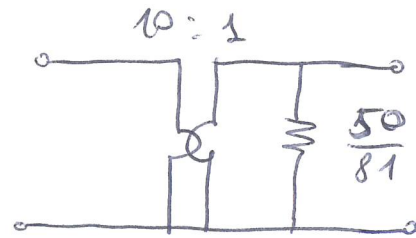
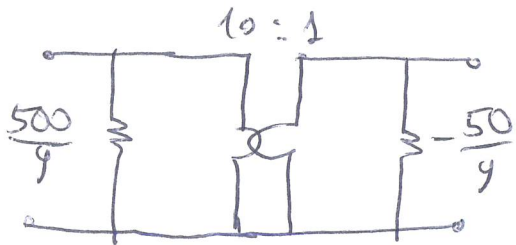
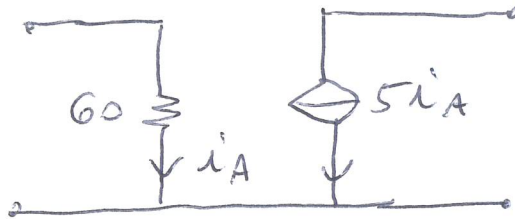
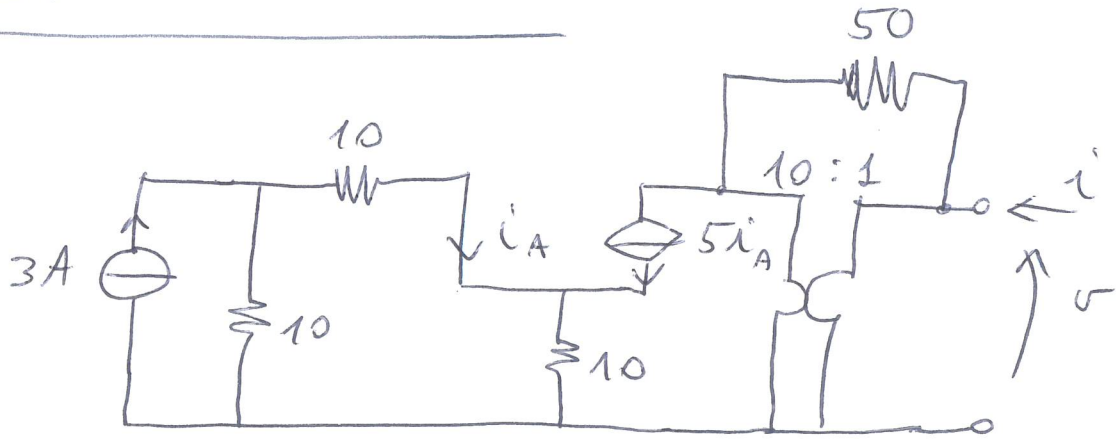
$$V_{eq} \Rightarrow V_{eq} = V_A - V_B = 50 - 40 = 10 V$$



$$I_n = \frac{10}{27} A$$

# THEVENIN - NO RTON

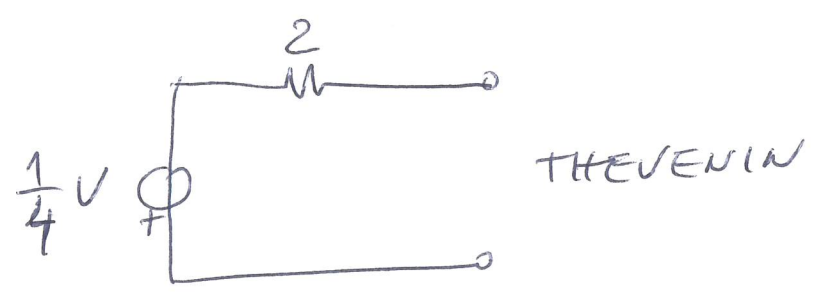
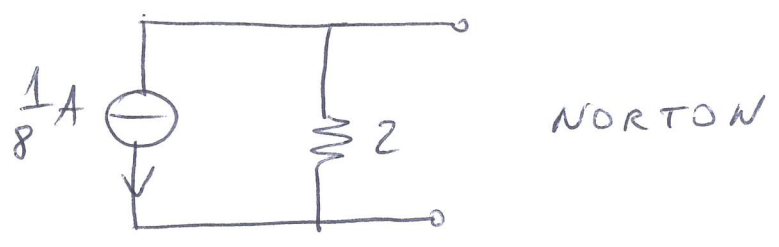
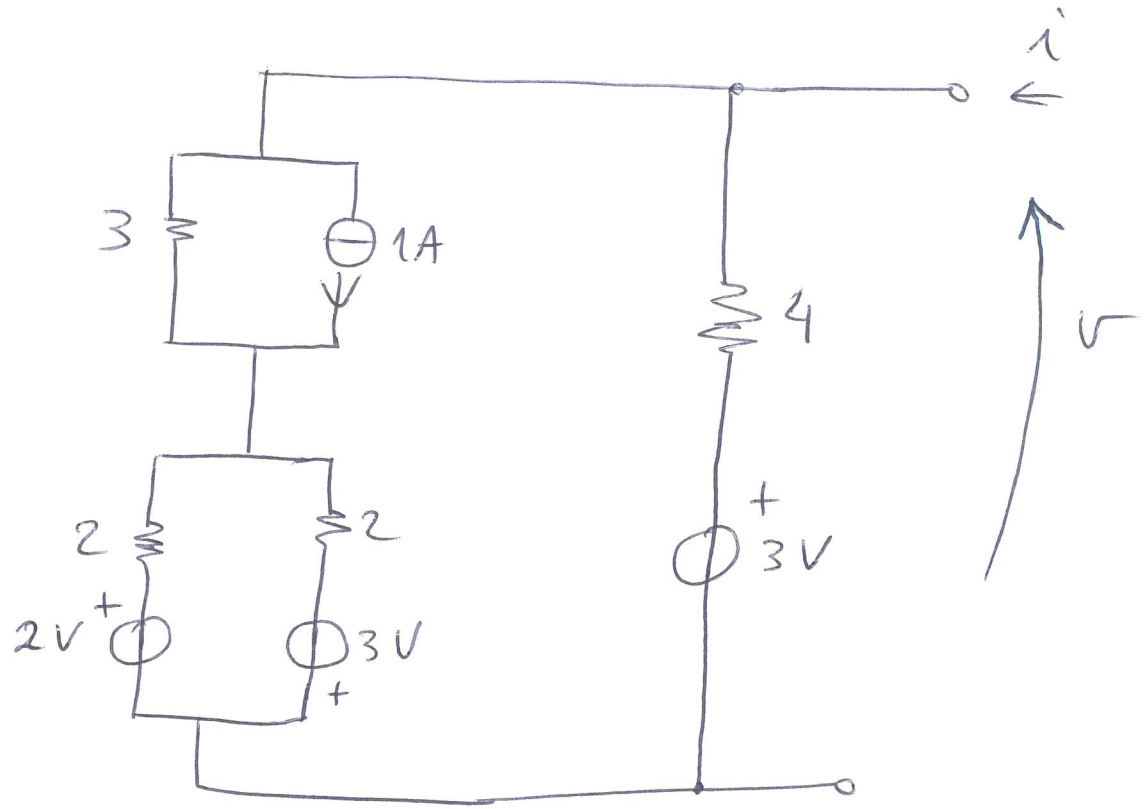
8)



NORTON

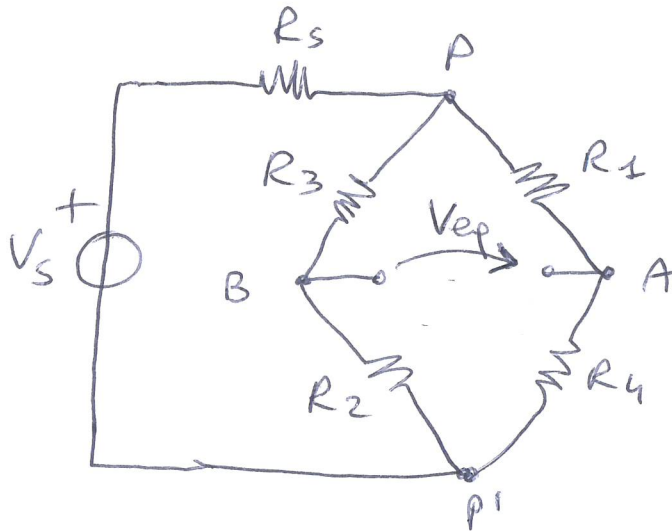
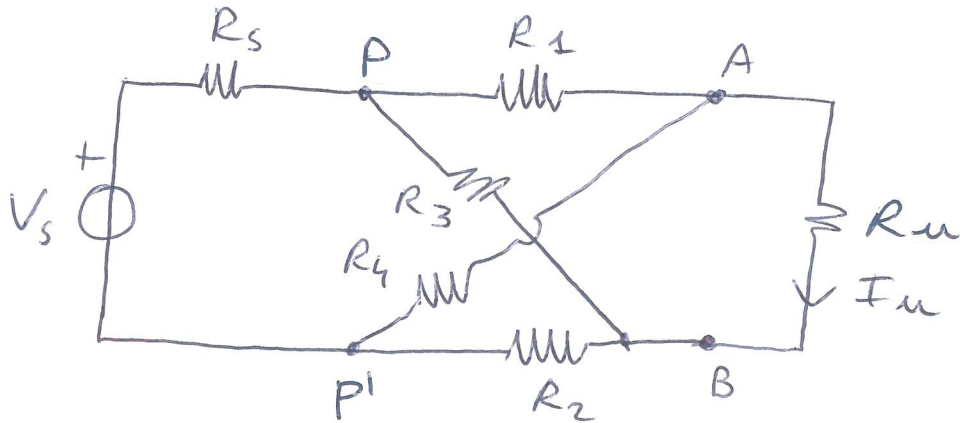
# THEVENIN - NORTON

9)



# THEVENIN - NORTON

10) (c)



$$V_{PPI} = \frac{(R_1 + R_4) \parallel (R_2 + R_3)}{R_s + (R_1 + R_4) \parallel (R_2 + R_3)} V_s$$

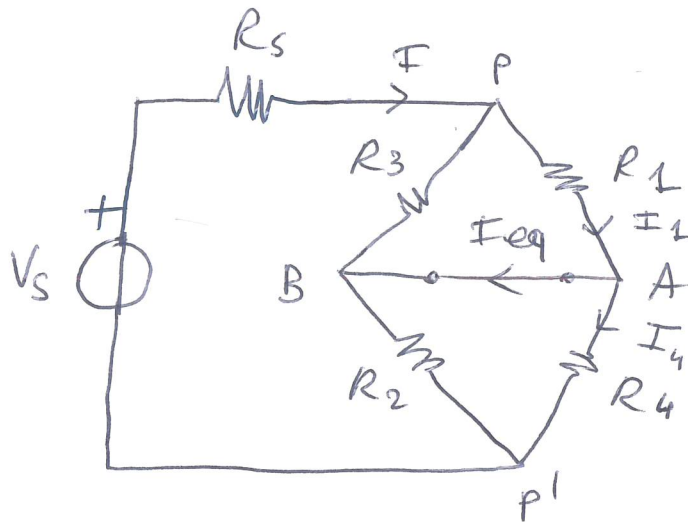
$$V_{eq} = V_A - V_B = \left[ \frac{R_4}{R_1 + R_4} - \frac{R_2}{R_2 + R_3} \right] V_{PPI}$$

$$\frac{R_3 R_4 - R_1 R_2}{R_1 + R_2 + R_3 + R_4}$$

$$V_{eq} = 0 \quad \text{or} \quad R_1 R_2 = R_3 R_4 \quad \underline{\text{COND. EQUIL.}}$$

# THEVENIN - NORTON

10) (P)

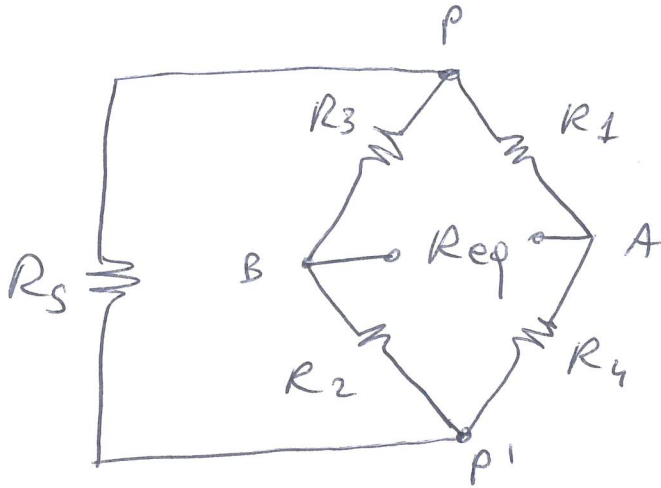


$$I = \frac{V_s}{R_s + \frac{R_1 R_3}{R_1 + R_3} + \frac{R_2 R_4}{R_2 + R_4}}$$

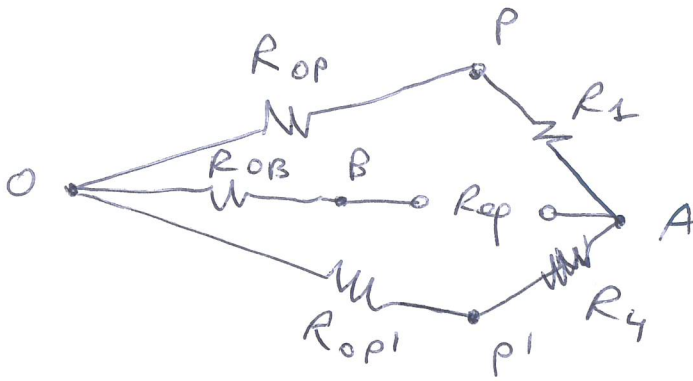
$$I_{eq} = I_1 - I_4 = \left( \frac{R_3}{R_1 + R_3} - \frac{R_2}{R_2 + R_4} \right) I$$

# THEVENIN - NORTON

10) (c)

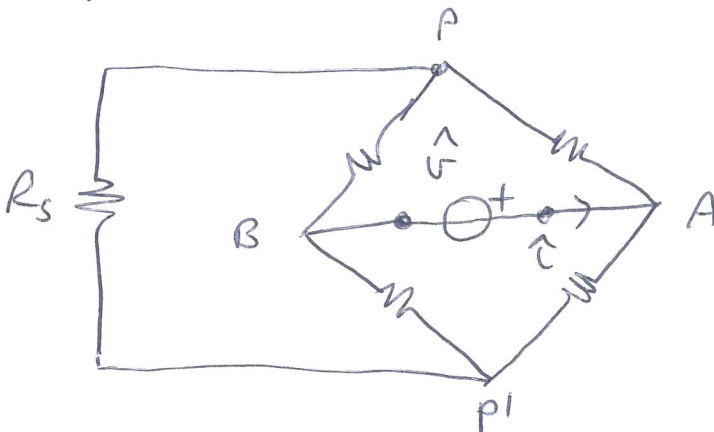


$$R_{eq} \triangleq \frac{V_{eq}}{I_{eq}}$$



$$R^1 = (R_{op} + R_1) \parallel (R_{op1} + R_4)$$

$$R_{eq} = R_{ob} + R^1$$

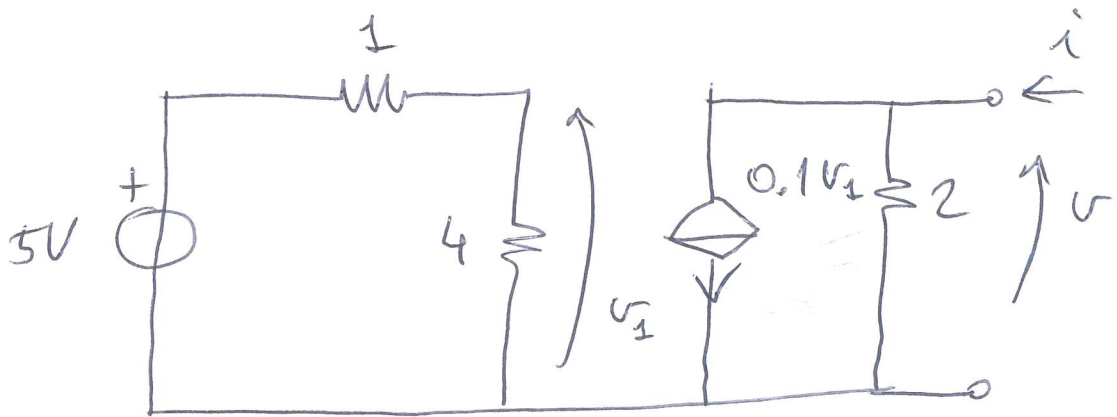


$$R_{eq} = \frac{V}{I}$$



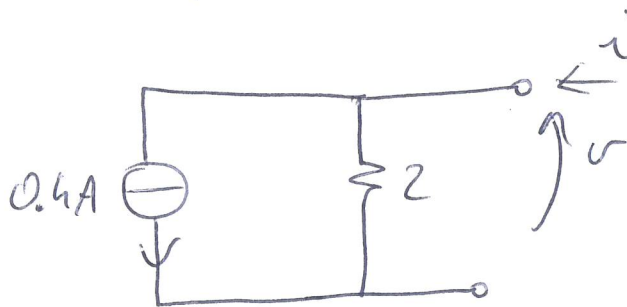
# THEVENIN - NORTON

11)

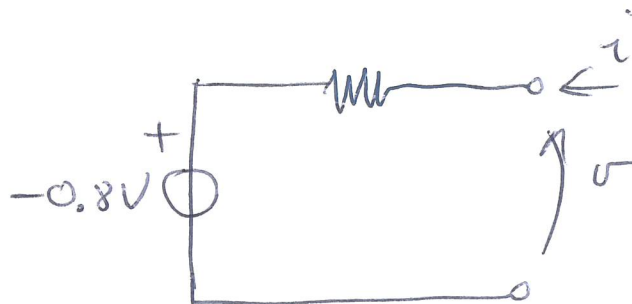


$$V_2 = \frac{4}{1+4} 5 = 4V$$

$$0.1V_2 = 0.4A$$



NORTON



THEVENIN