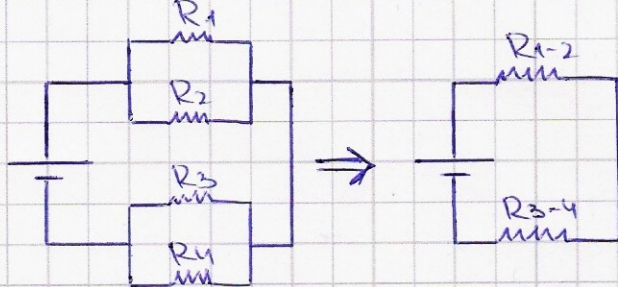


1) $R_T = ?$

$U_{(R_4)} = ?$



$R_1 \parallel R_2$

$R_3 \parallel R_4$

$R_{1-2} = \frac{R}{n} = \frac{100}{2} = 50 \Omega = R_{3-4}$

$R_T = R_{1-2} + R_{3-4} = 50 + 50 = 100 \Omega$

$I_T = \frac{E}{R_T} = \frac{100}{100} = 1 \text{ A}$

$U_{(R_4)} = U_{(R_{3-4})} = I \cdot R_{3-4} = 1 \cdot 50 = 50 \text{ V}$

$$2) R_T = ?$$

$$I(R_5) = ?$$

$$R_2 \parallel R_3$$

$$R_{2-3} = \frac{R}{n} = \frac{40}{2} = 20 \Omega$$

$$R_{2-4} = R_{2-3} + R_4 = 20 + 40 = 60 \Omega$$

$$R_{2-4} \parallel R_5$$

$$R_{2-5} = \left(\frac{1}{R_{2-4}} + \frac{1}{R_5} \right)^{-1} = \left(\frac{1}{60} + \frac{1}{40} \right)^{-1} = 24 \Omega$$

$$R_{2-5+7} = R_{2-5} + R_7 = 24 + 40 = 64 \Omega$$

$$R_{2-5+7} \parallel R_6$$

$$R_{2-7} = \left(\frac{1}{R_{2-5+7}} + \frac{1}{R_6} \right)^{-1} = \left(\frac{1}{64} + \frac{1}{40} \right)^{-1} = 24.615 \Omega$$

$$R_T = R_1 + R_{2-7} = 24.615 + 40 = 64.615 \Omega$$

$$I_T = I(R_1) = I(R_{2-7}) = \frac{E}{R_T} = \frac{220}{64.615} = 3.404 \text{ A}$$

$$U_{(R_{2-7})} = I \cdot R_{2-7} = 3.404 \cdot 24.615 = 83.789 \text{ V}$$

$$U_{(R_{2-7})} = U_{(R_{2-5+7})} = 83.789 \text{ V}$$

$$I_{(2-5+7)} = \frac{U_{2-5+7}}{R_{2-5+7}} = \frac{83.789}{64} = 1.309 \text{ A}$$

$$I_{(2-5+7)} = I(R_7) = I(R_{2-5}) = 1.309 \text{ A}$$

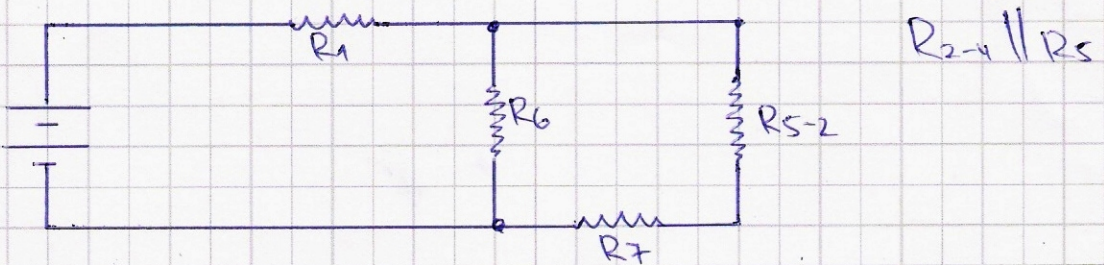
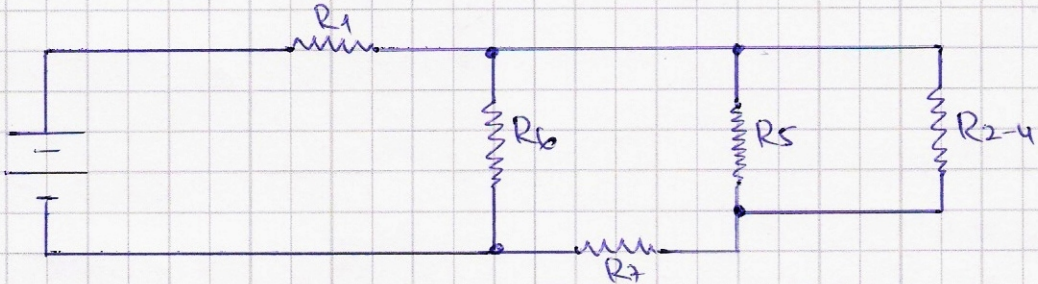
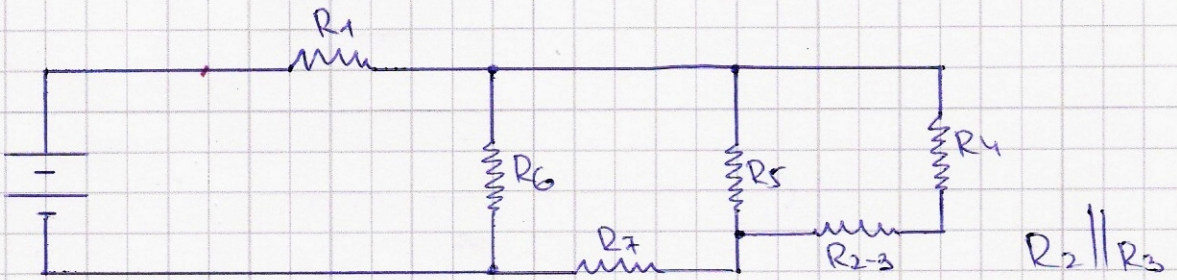
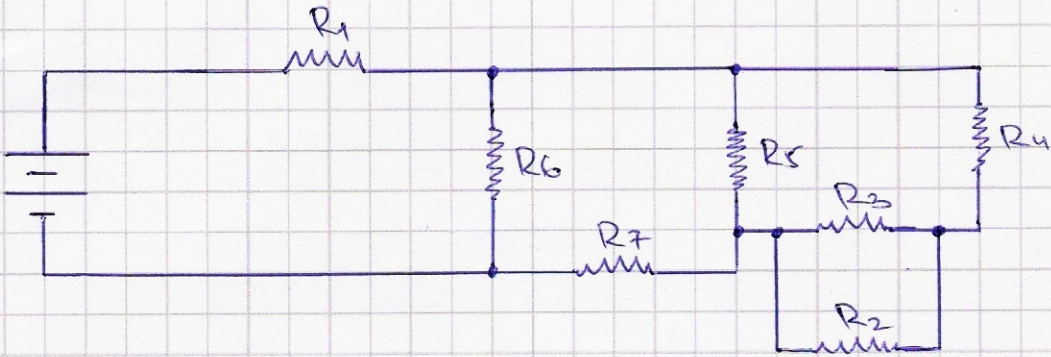
המשקל 2:

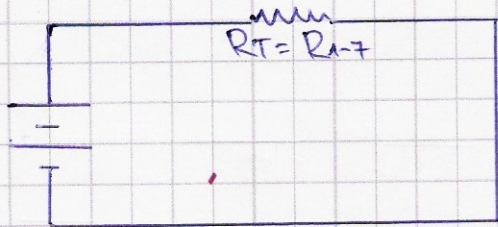
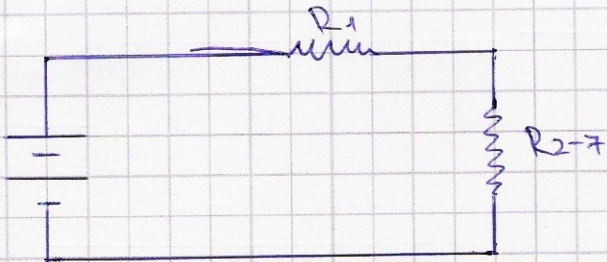
$$U_{2-5} = I_{2-5} \cdot R_{2-5} = 1.309 \cdot 24 = 31.416 \text{ V}$$

$$U_{2-5} = U_{R5} = U_{2-4} = 31.416 \text{ V}$$

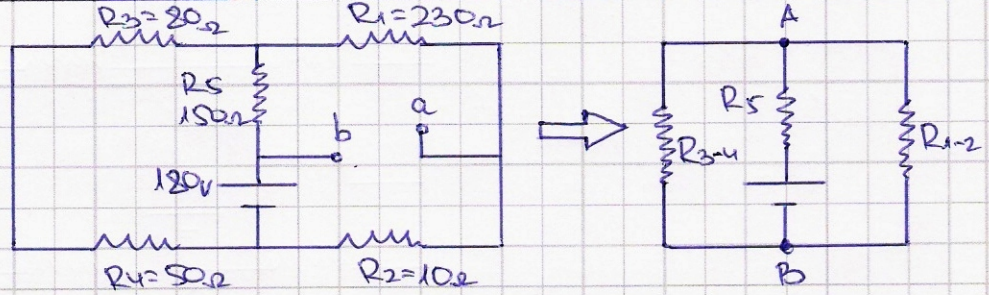
$$I_5 = \frac{U_{R5}}{R_5} = \frac{31.416}{40} = 0.7854 \text{ A}$$

: Problem 6.6e





3)



$$R_2 \text{ --- } \delta \text{ --- } R_1$$

$$R_4 \text{ --- } \delta \text{ --- } R_3$$

$$R_{1-2} \parallel R_{3-4}$$

$$R_{1-4} \text{ --- } \delta \text{ --- } R_5$$

$$R_{1-2} = R_1 + R_2 = 230 + 10 = 240 \Omega$$

$$R_{3-4} = R_3 + R_4 = 80 + 50 = 130 \Omega$$

$$R_{1-4} = \left(\frac{1}{R_{1-2}} + \frac{1}{R_{3-4}} \right)^{-1} = \left(\frac{1}{240} + \frac{1}{130} \right)^{-1} = 84.324 \Omega$$

$$R_T = R_{1-4} + R_5 = 84.324 + 150 = 234.324 \Omega$$

$$I_T = \frac{E}{R_T} = \frac{120}{234.324} = 0.768 \text{ A}$$

$$U_{(R_{1-4})} = I_T \cdot R_{1-4} = 0.768 \cdot 84.324 = 64.774 \text{ V} = U_{(R_{1-2})} = U_{(R_{3-4})}$$

$$U_{(R_5)} = I_T \cdot R_5 = 0.768 \cdot 150 = 115.225 \text{ V}$$

$$I_{(R_{1-2})} = \frac{U_{(R_{1-2})}}{R_{1-2}} = \frac{64.774}{240} = 0.269 \text{ A}$$

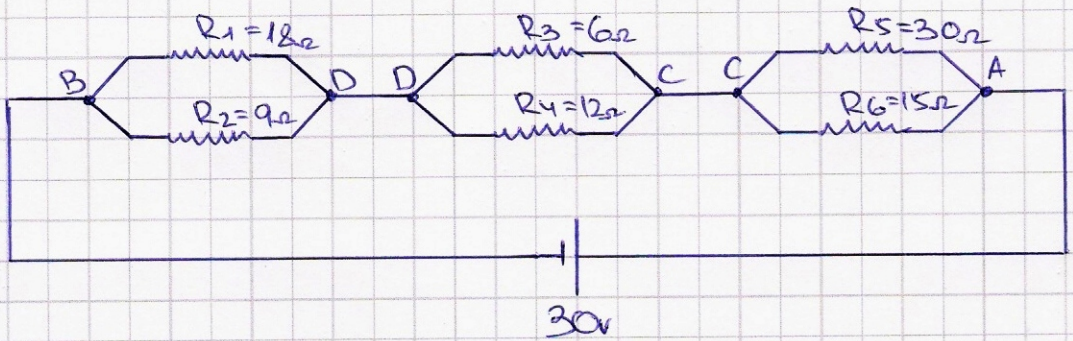
$$U_{(R_1)} = I_{(R_{1-2})} \cdot R_1 = 0.269 \cdot 230 = 62.075 \text{ V}$$

$$U_{(R_2)} = I_{(R_{1-2})} \cdot R_2 = 0.269 \cdot 10 = 2.69 \text{ V}$$

ICP3
a-δ b-ν $U_{b-a} = U_{(R_5)} + U_{(R_1)} = 115.225 + 62.075 = \underline{\underline{177.3 \text{ V}}}$

ICP3
b-δ a-ν $U_{a-b} = E - U_{(R_2)} = 120 - 2.69 = \underline{\underline{117.3 \text{ V}}}$

4)



$$R_1 \parallel R_2$$

$$R_{1-2} = \left(\frac{1}{R_1} + \frac{1}{R_2} \right)^{-1} = \left(\frac{1}{18} + \frac{1}{9} \right)^{-1} = 6\Omega$$

$$R_3 \parallel R_4$$

$$R_{3-4} = \left(\frac{1}{R_3} + \frac{1}{R_4} \right)^{-1} = \left(\frac{1}{6} + \frac{1}{12} \right)^{-1} = 4\Omega$$

$$R_5 \parallel R_6$$

$$R_{5-6} = \left(\frac{1}{R_5} + \frac{1}{R_6} \right)^{-1} = \left(\frac{1}{30} + \frac{1}{15} \right)^{-1} = 10\Omega$$

$$R_T = R_{1-2} + R_{3-4} + R_{5-6} = 6 + 4 + 10 = 20\Omega$$

$$I_T = \frac{E}{R_T} = \frac{30}{20} = 1.5\text{ A}$$

$$I_{(R_6)} = E \cdot \frac{R_5}{R_5 + R_6} = 1.5 \cdot \frac{30}{30 + 15} = 1\text{ A}$$

$$I_{(R_4)} = E \cdot \frac{R_3}{R_3 + R_4} = 1.5 \cdot \frac{6}{6 + 12} = 0.5\text{ A}$$

$$I_2 = I_{(R_6)} - I_{(R_4)} = 1 - 0.5 = 0.5\text{ A}$$

$$I_{(R_2)} = E \cdot \frac{R_1}{R_1 + R_2} = 1.5 \cdot \frac{18}{18 + 9} = 1\text{ A}$$

$$I_1 = I_{(R_4)} - I_{(R_2)} = 0.5 - 1 = -0.5\text{ A} \quad (\text{30V source only})$$