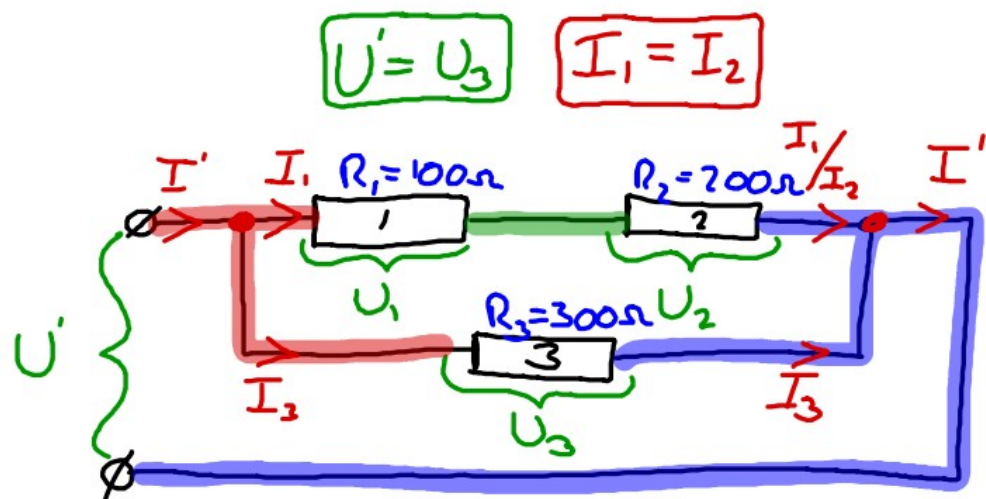


Blandetkredsløb

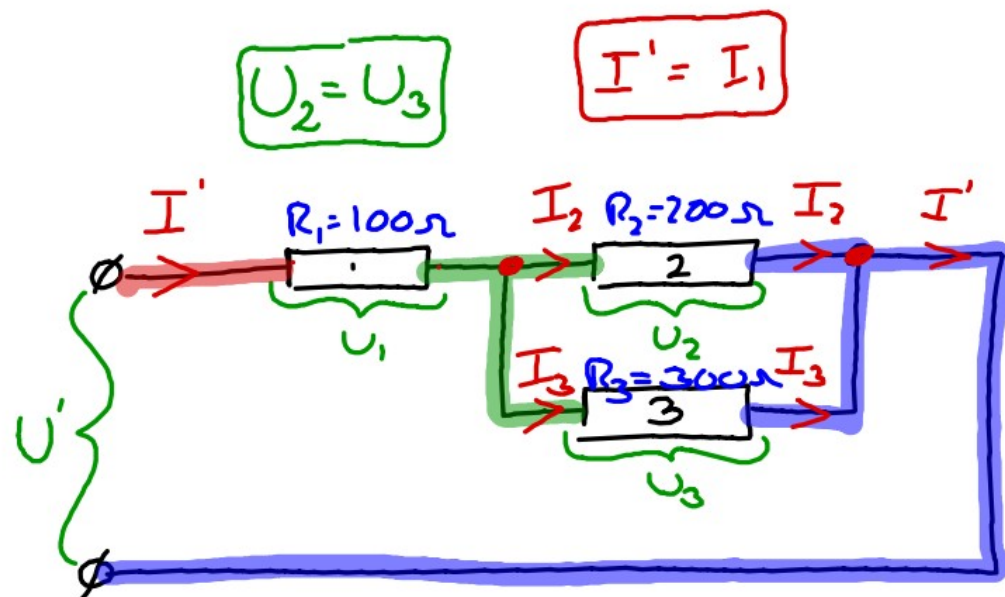
Modstande i serie og i parallel i samme kreds



KREDSENS SAMLEDE MODSTAND

$$\textcircled{1} \boxed{R_{1,2}} = R_1 + R_2 = 100 + 200 = \underline{300\Omega}$$

$$\textcircled{2} R' = (\boxed{R_{1,2}}^{-1} + R_3^{-1})^{-1} = (300^{-1} + 300^{-1})^{-1} = \underline{\underline{150\Omega}}$$



KREDSENS SAMLEDE MODSTAND

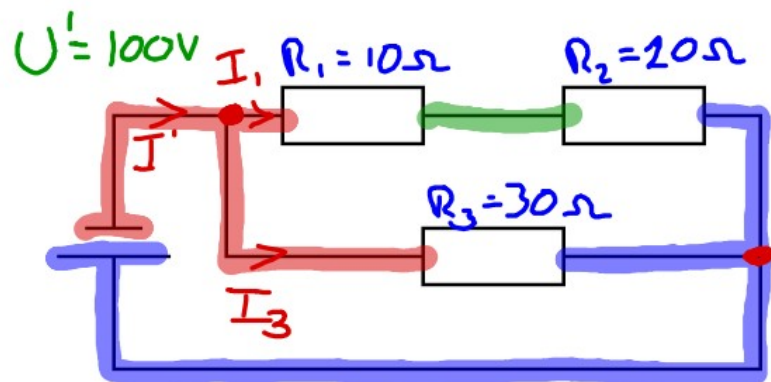
$$\textcircled{1} \boxed{R_{2,3}} = (R_2^{-1} + R_3^{-1})^{-1} = (200^{-1} + 300^{-1})^{-1} = \underline{120\Omega}$$

$$\textcircled{2} R' = R_1 + \boxed{R_{2,3}} = 100 + 120 = \underline{\underline{220\Omega}}$$

$\boxed{} = \text{ERSTATNINGS MODSTAND}$

Tavleopgave 1

Blandetkreds med 3 modstande



KREDSENS REGLER (KIRCHHOFF'S)

$U' = U_3$

$I_1 = I_2$

	U	I	R
1	33,33V	3,33A	10Ω
2	66,67V		20Ω
3	100V	3,33A	30Ω
Tot	100V	6,67A	15Ω

$$\textcircled{1} R_{1,2} = R_1 + R_2 = 10 + 20 = \underline{30\Omega}$$

$$\textcircled{2} R' = (R_{1,2}^{-1} + R_3^{-1})^{-1} = (30^{-1} + 30^{-1})^{-1} = \underline{15\Omega}$$

$$\textcircled{3} I' = \frac{U'}{R'} = \frac{100}{15} = \underline{6,67A}$$

$$\textcircled{4} I_3 = \frac{U_3}{R_3} = \frac{100}{30} = \underline{3,33A}$$

$$\textcircled{5} I_1 = I' - I_3 = 6,67 - 3,33 = \underline{3,33A}$$

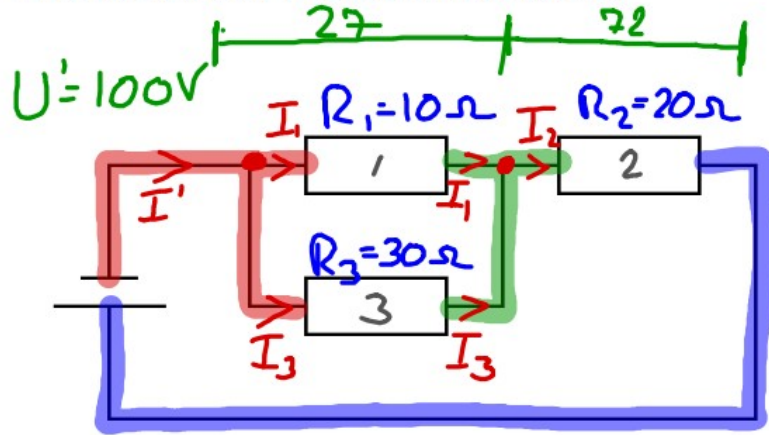
$$\textcircled{6} U_1 = I_1 \times R_1 = 3,33 \times 10 = \underline{33,33V}$$

$$\textcircled{7} U_2 = I_2 \times R_2 = 3,33 \times 20 = \underline{66,67V}$$

$$\textcircled{8} U_2 = U' - U_1 = 100 - 33,33 = \underline{66,67V}$$

Tavleopgave 2

Blandetkreds med 3 modstande



KREDSENS REGLER (KIRCHHOFF'S)

$U_1 = U_3$ $I' = I_2$

	U	I	R
1	27,27V	2,73A	10Ω
2	72,73V	3,64A	20Ω
3	27,27V	909,09mA	30Ω
Alt	100V	3,64A	27,5Ω

$$\textcircled{1} R_{1,3} = (R_1' + R_3')' = (10' + 30')' = \underline{7,5\Omega}$$

$$\textcircled{2} R' = R_{1,3} + R_2 = 7,5 + 20 = \underline{27,5\Omega}$$

$$\textcircled{3} I' = \frac{U'}{R'} = \frac{100}{27,5} = \underline{3,64A}$$

$$\textcircled{4} U_2 = I_2 \times R_2 = 3,64 \times 20 = \underline{72,73V}$$

$$\textcircled{5} U_1 = U' - U_2 = 100 - 72,73 = \underline{27,27V}$$

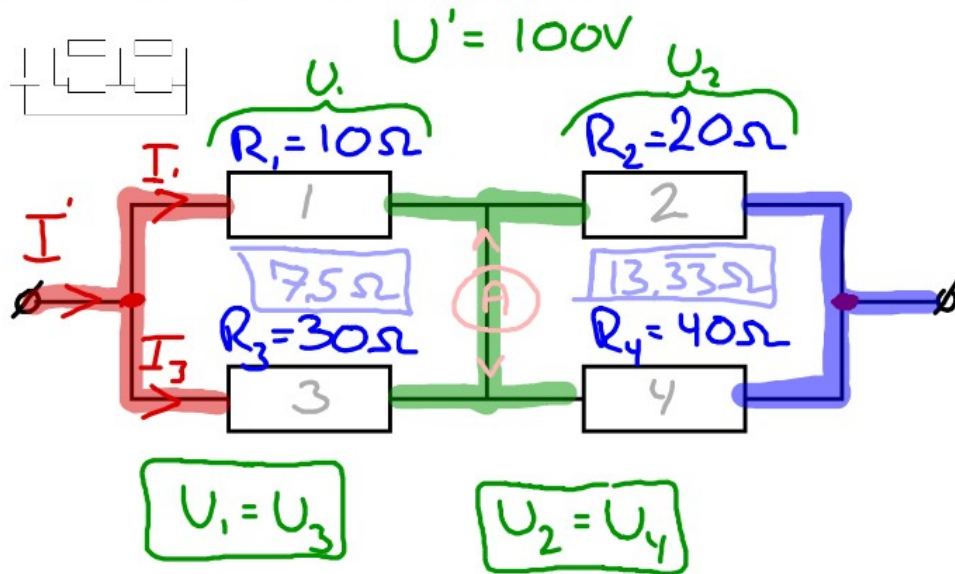
$$\textcircled{6} I_1 = \frac{U_1}{R_1} = \frac{27,27}{10} = \underline{2,73A}$$

$$\textcircled{7} I_3 = \frac{U_3}{R_3} = \frac{27,27}{30} = \underline{909,09mA}$$

$$\textcircled{8} I_3 = I' - I_1 = 3,64 - 2,73 = \underline{909,09mA}$$

Tavleopgave Ekstra

Blandetkreds med 4 modstande



	U	I	R
1	36V	3,6A	10 Ω
2	64V	3,2A	20 Ω
3	36V	1,2A	30 Ω
4	64V	1,6A	40 Ω
tot	100V	4,8A	20,83Ω

$$R_{1,3} = (R_1^{-1} + R_3^{-1})^{-1} = (10^{-1} + 30^{-1})^{-1} = 7.5\Omega$$

$$R_{2,4} = (R_2^{-1} + R_4^{-1})^{-1} = (20^{-1} + 40^{-1})^{-1} = 13.33\Omega$$

$$R' = R_{1,3} + R_{2,4} = 7.5 + 13.33 = 20.83\Omega$$

$$I' = \frac{U'}{R'} = \frac{100}{20.83} = 4.8A$$

$$U_1 = I' \times R_{1,3} = 4.8 \times 7.5 = 36V$$

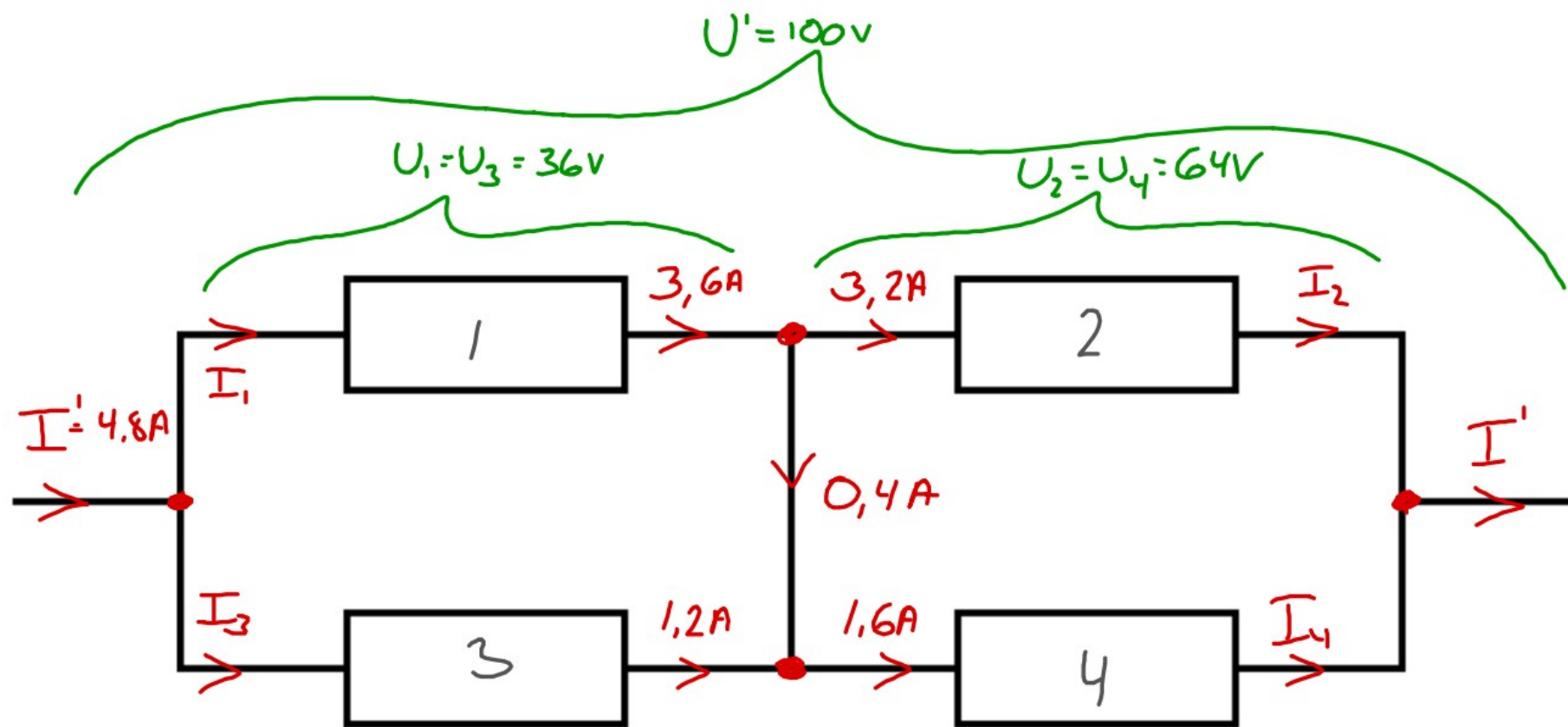
$$U_3 = I' \times R_{2,4} = 4.8 \times 13.33 = 64V$$

$$I_1 = \frac{U_1}{R_1} = \frac{36}{10} = 3.6A$$

$$I_2 = \frac{U_2}{R_2} = \frac{64}{20} = 3.2A$$

$$I_3 = \frac{U_3}{R_3} = \frac{36}{30} = 1.2A$$

$$I_4 = \frac{U_4}{R_4} = \frac{64}{40} = 1.6A$$



CowboyTrick

Omtegn kredsen!

