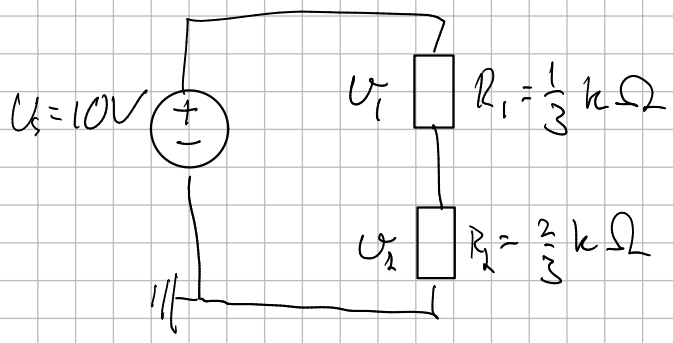
Oppgave 2)



Oppgave 3)

$U_s = U_1 + U_2 \qquad U_s = U_1 + U_2 \qquad U_1 = i R_1 \qquad U_2 = i R_2 \qquad R = R_1 + R_2$

$U_1 = U_s - U_2 \qquad U_s = i \cdot R \qquad i = \frac{U_s}{R}$

$U_1 = i R - i R_2$

$U_1 = i(R - R_2) = \frac{U_s}{R}(R - R_2)$

$U_1 = U_s \frac{R_1 + R_2 - R_2}{R_1 + R_2} = U_s \frac{R_1}{R_1 + R_2}$

Oppgave 4)

$U_1 = U_s \frac{R_1}{R_1 + R_2} = \frac{1}{3} V$

$U_2 = U_s \frac{R_2}{R_1 + R_2} = \frac{2}{3} V$

proporsjonal med forholdet mellom motstanden og totalmotstand

Oppg 5)

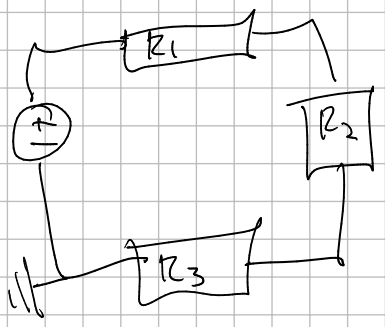
$R_1 = 1\ k\Omega \qquad R_2 = 3{,}3\ k\Omega$

$U_1 = U \frac{R_1}{R_1 + R_2} = 1{,}15 V$ Måling: 1,16 V

$U_2 = U \frac{R_2}{R_1 + R_2} = 3{,}85 V$ 3,83 V

Ομάδα 6)

$U_s = 10\,V \quad R_1 = \frac{2}{10}\,k\Omega \quad R_2 = \frac{3}{10}\,k\Omega \quad R_3 = \frac{5}{10}\,k\Omega$



Ομάδα 7)

$U_s = u_1 + u_2 + u_3 \qquad u_1 = i\,R \qquad R = R_1 + R_2 + R_3$

$u_1 = i\,R_1 \qquad u_2 = i\,R_2 \qquad u_3 = i\,R_3$

$u_1 = U_s - u_2 - u_3$

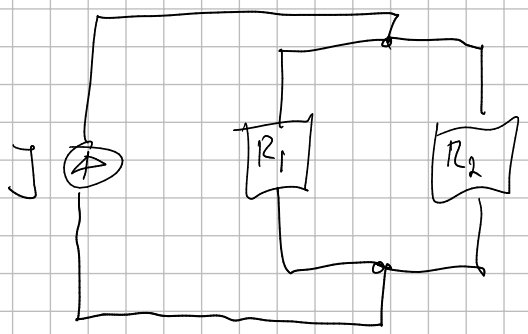
$= i\,R - i\,R_2 - i\,R_3$

$= i(R - R_2 - R_3) = i(R_1) \qquad U_s = i\,R \Rightarrow i = \frac{U_s}{R}$

$= U_s \frac{R_1}{R_1 + R_2 + R_3}$

Ομάδα 10)

$J = 45\,mA \qquad R_1 = \frac{1}{3}\,k\Omega \qquad R_2 = 2\,k\Omega$



Ομάδα 11)

$U = R\,I \qquad U = r_1 i_1 \qquad U = r_2 i_2 \qquad I = i_1 + i_2$

$r_1 i_1 = r_2 i_2 \qquad i_2 = I - i_1$

$r_1 i_1 = r_2 (I - i_1)$

$$r_1 i_1 = r_2 I - r_2 i_1$$

$$r_1 i_1 + r_2 i_1 = r_2 I$$

$$i_1 (r_1 + r_2) = r_2 I$$

$$\underline{\underline{i_1 = I \frac{r_2}{r_1 + r_2}}}$$

Oppg (2) $I = 45\ mA$ $R_1 = \frac{1}{3} k\Omega$ $R_2 = \frac{2}{3} k\Omega$

$$i_1 = I \frac{r_2}{r_1 + r_2} = 15\ mA$$

$$i_2 = I \frac{r_1}{r_1 + r_2} = 30\ mA$$

Strømmen fikser forholdet mellom Total motstand minus motstand og total motstand

Oppg (3)

$U = 5V$ $R_1 = 1\ k\Omega$ $R_2 = 3{,}3\ k\Omega$ $R = \left(\frac{1}{R_1} + \frac{1}{R_2}\right)^{-1} = 7{,}69\ e2\ \Omega$

$$I_{tot} = \frac{U}{R} = 6{,}5\ mA$$

	Måling
$i_1 = I \frac{r_2}{r_1 + r_2} = 5{,}00\ mA$	$5{,}07\ mA$
$i_2 = I \frac{r_1}{r_1 + r_2} = 1{,}5\ mA$	$1{,}52\ mA$

Oppg (8)

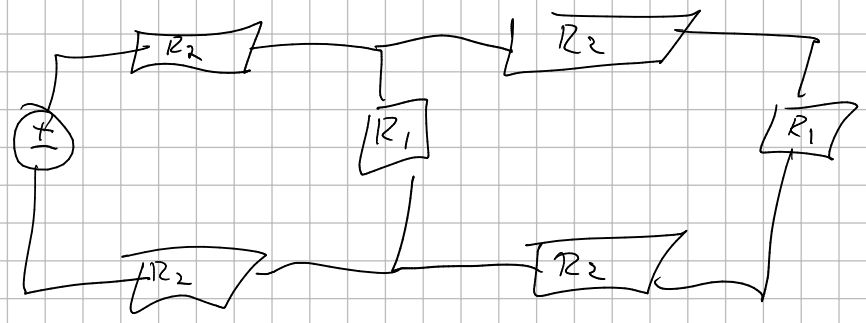
a) $R = \left(\frac{1}{R} + \frac{1}{R}\right)^{-1} + \left(\frac{1}{R} + \frac{1}{R}\right)^{-1} = \frac{R}{2} + \frac{R}{2} = \underline{\underline{R}}$

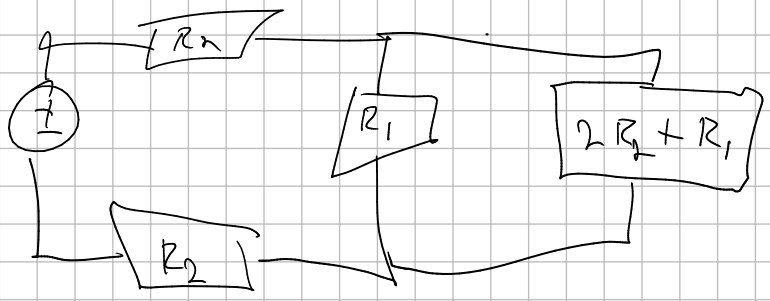
b) $R = \left(\frac{1}{2R} + \frac{1}{2R}\right)^{-1} = \left(\frac{2}{2R}\right)^{-1} = \underline{\underline{R}}$

c) $\underline{\underline{R}}$

d) $R = \left(\frac{1}{R} + \frac{1}{R}\right)^{-1} + R + \left(\frac{1}{R} + \frac{1}{R}\right)^{-1} = \frac{R}{2} + R + \frac{R}{2} = \underline{2R}$

Опыт 23)





$$R = 2R_2 + \left(\frac{1}{R_1} + \frac{1}{2R_2 + R_1}\right)^{-1} = 2R_2 + \left(\frac{2R_2 + R_1 + R_1}{2R_2R_1 + R_1^2}\right)^{-1}$$

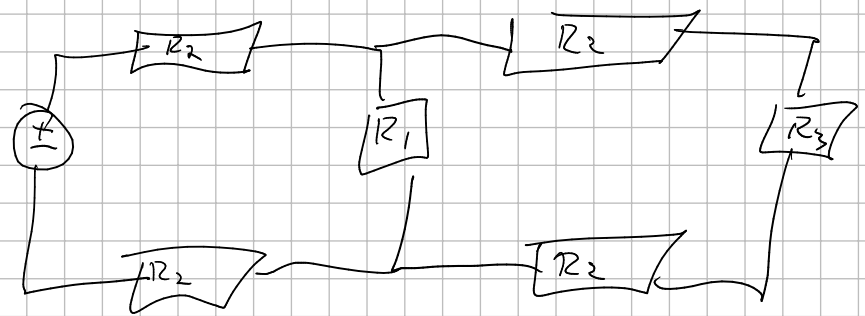
$$= 2R_2 + \frac{2R_2R_1 + R_1^2}{2(R_1 + R_2)} = \frac{(2R_2)(2R_1 + 2R_2) + 2R_2R_1 + R_1^2}{2(R_1 + R_2)}$$

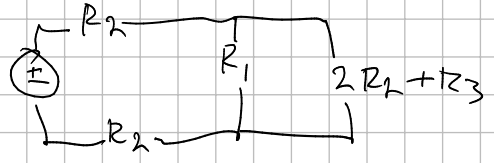
$$= \frac{4R_1R_2 + 4R_2^2 + 2R_2R_1 + R_1^2}{2(R_1 + R_2)}$$

$$= \frac{6R_1R_2 + 4R_2^2 + R_1^2}{2(R_1 + R_2)}$$

Опыт 24) $P = \frac{U^2}{R} = \frac{2U(2R_1 + R_2)}{4R_2^2 + 6R_1R_2 + 4R_2^2}$

Опыт 25)

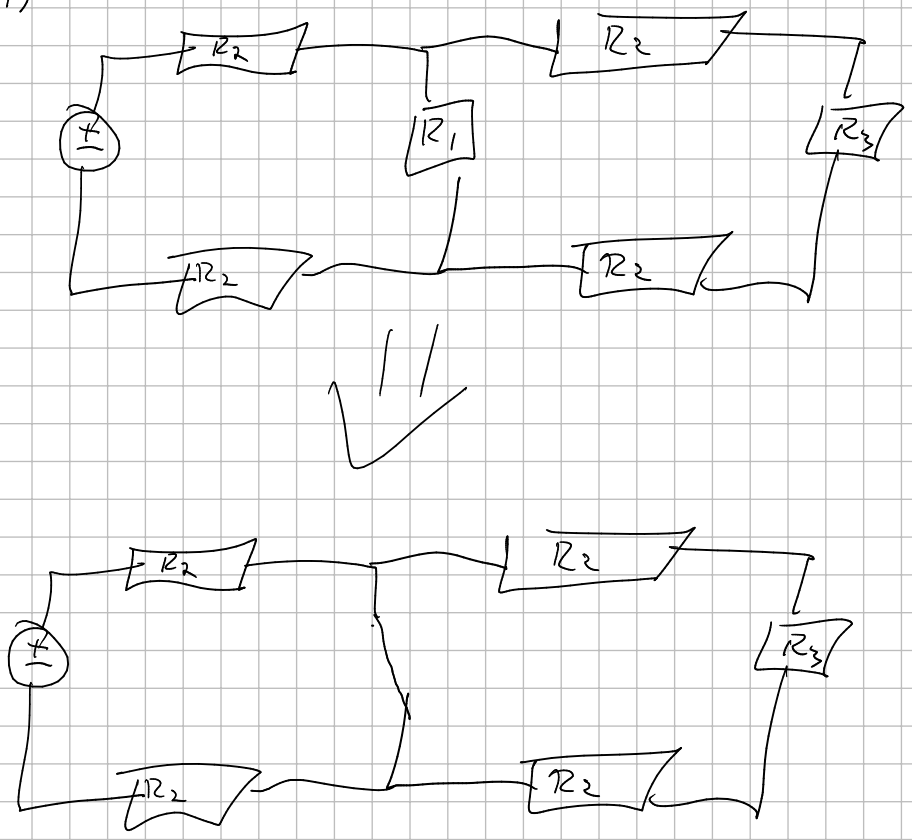




$$R = 2R_2 + \left(\frac{1}{R_1} + \frac{1}{2R_2 + R_3}\right)^{-1} = 2R_2 + \left(\frac{R_1 + 2R_2 + R_3}{2R_1R_2 + R_1R_3}\right)^{-1}$$

$$= 2R_2 + \frac{2R_1R_2 + R_1R_3}{R_1 + 2R_2 + R_3} = \frac{(2R_2)(R_1 + 2R_2 + R_3) + 2R_1R_2 + R_1R_3}{R_1 + 2R_2 + R_3}$$

$$= \frac{2R_1R_2 + 4R_2^2 + 2R_2R_3 + 2R_1R_2 + R_1R_3}{R_1 + 2R_2 + R_3}$$

$$= \frac{4R_2^2 + 4R_1R_2 + 2R_2R_3 + R_1R_3}{R_1 + 2R_2 + R_3}$$

Ответ 2.7)