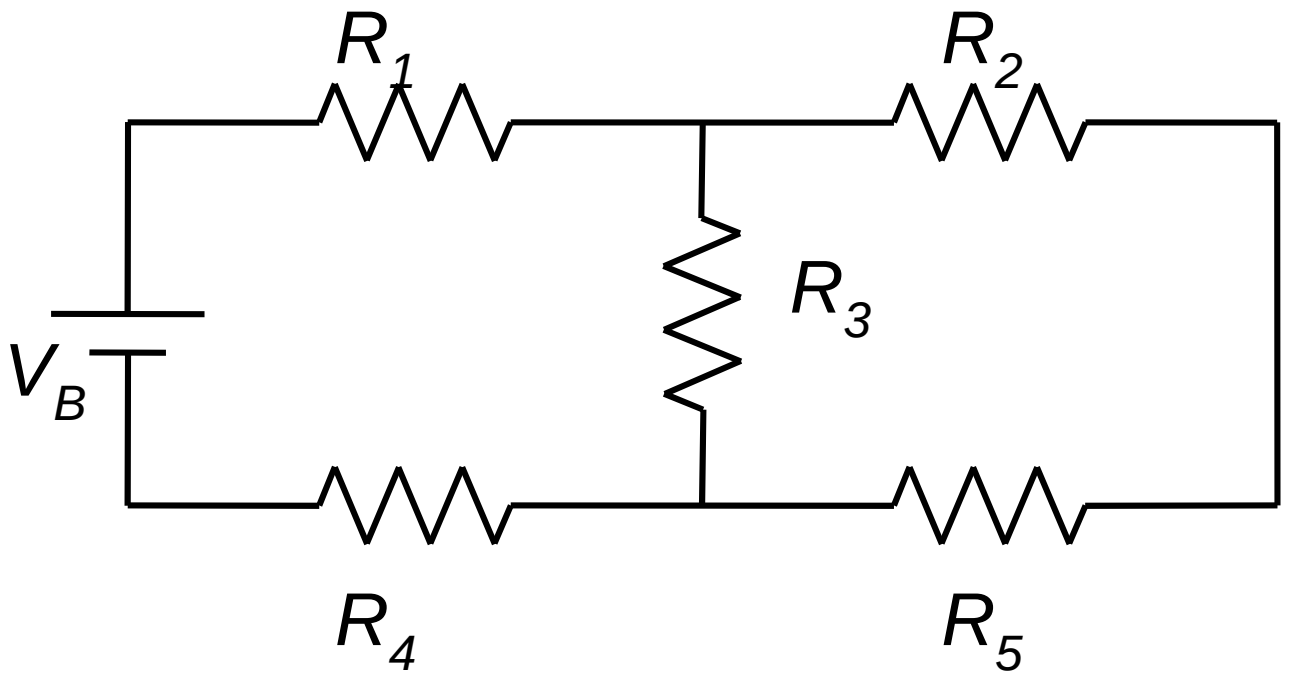
Determine the current through each resistor, the total current and the voltage across each resistor.



$V_B = 24\,\text{V}$

$R_1 = 84\,\Omega$

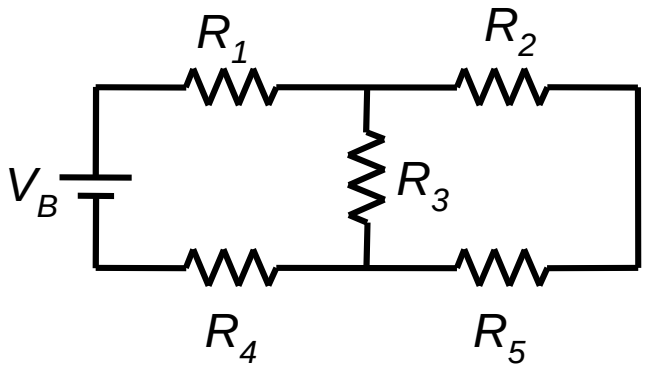
$R_2 = 51\,\Omega$

$R_3 = 96\,\Omega$

$R_4 = 35\,\Omega$

$R_5 = 75\,\Omega$

Determine the current through each resistor, the total current and the voltage across each resistor.



Determine equivalent resistance.

Note:

- Every charge goes through R_1.
- Charges go through either R_3 or R_2 and R_5.
- Every charge goes through R_4.

$V_B = 24\,\text{V}$

$R_1 = 84\,\Omega$

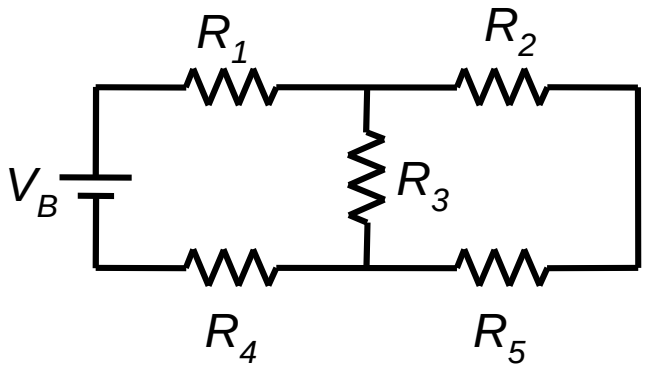
$R_2 = 51\,\Omega$

$R_3 = 96\,\Omega$

$R_4 = 35\,\Omega$

$R_5 = 75\,\Omega$

Determine the current through each resistor, the total current and the voltage across each resistor.



$V_B = 24\,\text{V}$
$R_1 = 84\,\Omega$
$R_2 = 51\,\Omega$
$R_3 = 96\,\Omega$
$R_4 = 35\,\Omega$
$R_5 = 75\,\Omega$

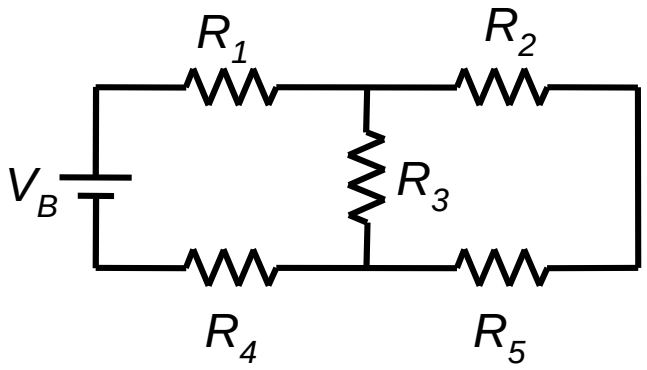
Determine equivalent resistance.

Note:

- Every charge goes through R_1.
- Charges go through either R_3 or R_2 and R_5.
- Every charge goes through R_4.

R_2 is in series with R_5.
R_3 is in parallel with R_{25}.
R_1 is in series with R_{325} and R_4.

Determine the current through each resistor, the total current and the voltage across each resistor.



$$R_{25} = R_2 + R_5$$

$$R_{25} = 51\,\Omega + 75\,\Omega$$

$$R_{25} = 126\,\Omega$$

$V_B = 24\,\text{V}$ $R_{25} = 126\,\Omega$

$R_1 = 84\,\Omega$

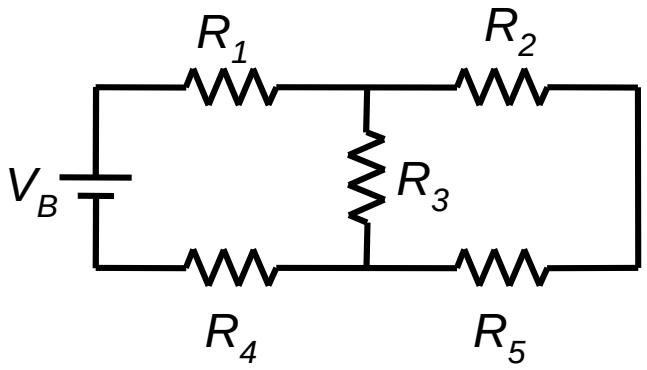
$R_2 = 51\,\Omega$

$R_3 = 96\,\Omega$

$R_4 = 35\,\Omega$

$R_5 = 75\,\Omega$

Determine the current through each resistor, the total current and the voltage across each resistor.



$$R_{325} = \left(R_3^{-1} + R_{25}^{-1}\right)^{-1}$$

$$R_{325} = \left[(96\,\Omega)^{-1} + (126\,\Omega)^{-1}\right]$$

$$R_{325} = 54\,\Omega$$

$V_B = 24\,\text{V}$ $R_{25} = 126\,\Omega$

$R_1 = 84\,\Omega$ $R_{325} = 54\,\Omega$

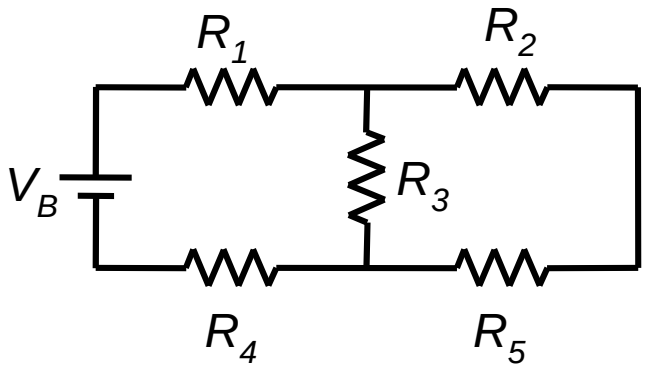
$R_2 = 51\,\Omega$

$R_3 = 96\,\Omega$

$R_4 = 35\,\Omega$

$R_5 = 75\,\Omega$

Determine the current through each resistor, the total current and the voltage across each resistor.



$$R_T = R_1 + R_{325} + R_4$$

$$R_T = 84\,\Omega + 54\,\Omega + 35\,\Omega$$

$$R_T = 173\,\Omega$$

$V_B = 24\,\text{V}$ $R_{25} = 126\,\Omega$

$R_1 = 84\,\Omega$ $R_{325} = 54\,\Omega$

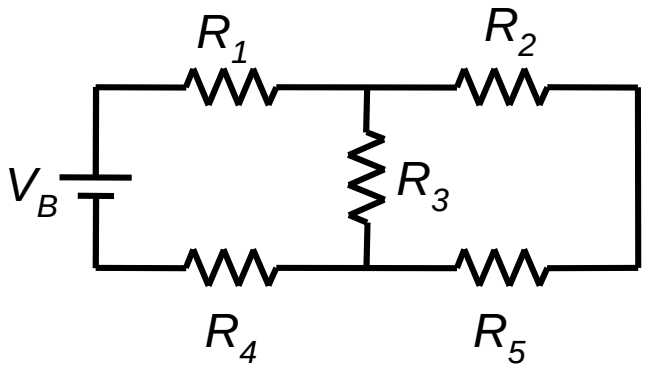
$R_2 = 51\,\Omega$ $R_T = 173\,\Omega$

$R_3 = 96\,\Omega$

$R_4 = 35\,\Omega$

$R_5 = 75\,\Omega$

Determine the current through each resistor, the total current and the voltage across each resistor.



Determine potential differences and currents.

$V_B = 24\,\text{V}$ $R_{25} = 126\,\Omega$

$R_1 = 84\,\Omega$ $R_{325} = 54\,\Omega$

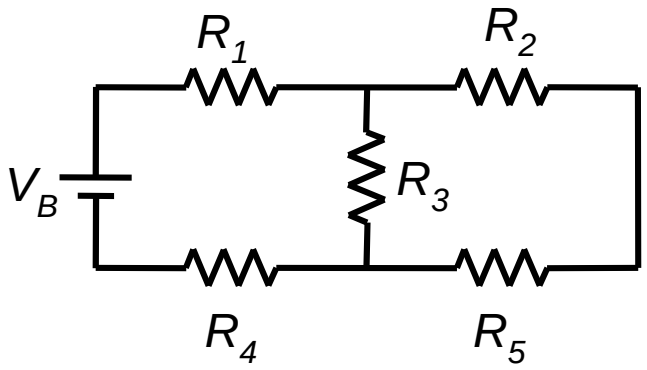
$R_2 = 51\,\Omega$ $R_T = 173\,\Omega$

$R_3 = 96\,\Omega$

$R_4 = 35\,\Omega$

$R_5 = 75\,\Omega$

Determine the current through each resistor, the total current and the voltage across each resistor.



$$I_T = \frac{V_B}{R_T}$$

$$I_T = \frac{24\,\text{V}}{173\,\Omega}$$

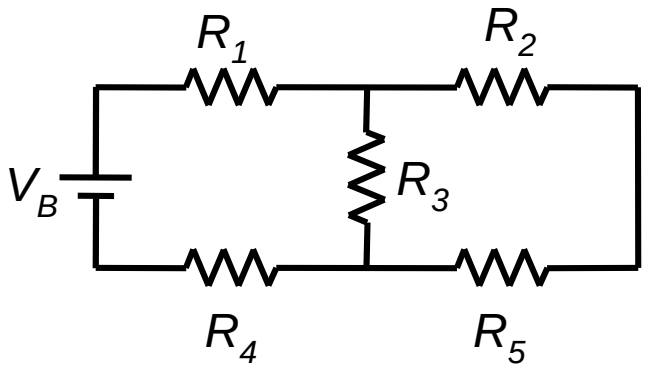
$$I_T = 0.14\,\text{A}$$

$V_B = 24\,\text{V}$
$R_1 = 84\,\Omega$
$R_2 = 51\,\Omega$
$R_3 = 96\,\Omega$
$R_4 = 35\,\Omega$
$R_5 = 75\,\Omega$

$R_{25} = 126\,\Omega$
$R_{325} = 54\,\Omega$
$R_T = 173\,\Omega$

$I_T = 0.14\,\text{A}$

Determine the current through each resistor, the total current and the voltage across each resistor.



Note that $I_T = I_1 = I_4$.

$V_B = 24\,\text{V}$ $R_{25} = 126\,\Omega$

$R_1 = 84\,\Omega$ $R_{325} = 54\,\Omega$

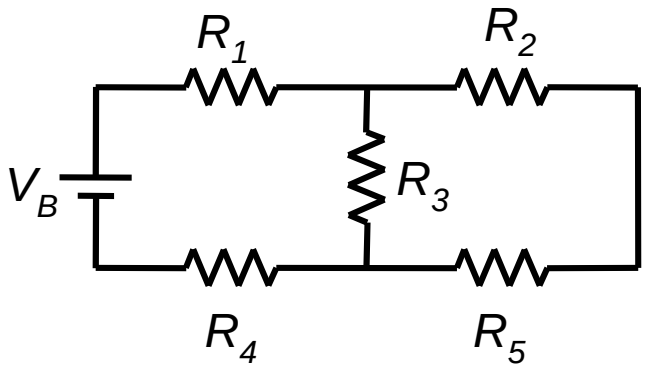
$R_2 = 51\,\Omega$ $R_T = 173\,\Omega$ $I_T = I_1 = I_4 = 0.14\,\text{A}$

$R_3 = 96\,\Omega$

$R_4 = 35\,\Omega$

$R_5 = 75\,\Omega$

Determine the current through each resistor, the total current and the voltage across each resistor.



$$V_1 = I_1 R_1$$

$$V_1 = (0.14\,\text{A})(84\,\Omega)$$

$$V_1 = 12\,\text{V}$$

$V_B = 24\,\text{V}$ $R_{25} = 126\,\Omega$

$R_1 = 84\,\Omega$ $R_{325} = 54\,\Omega$

$R_2 = 51\,\Omega$ $R_T = 173\,\Omega$

$R_3 = 96\,\Omega$

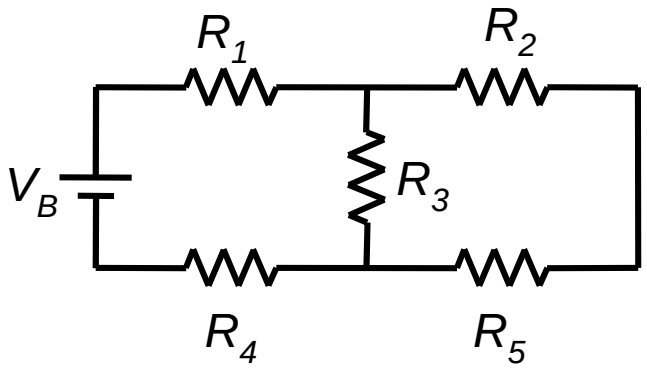
$R_4 = 35\,\Omega$

$R_5 = 75\,\Omega$

$$I_T = I_1 = I_4 = 0.14\,\text{A}$$

$$V_1 = 12\,\text{V}$$

Determine the current through each resistor, the total current and the voltage across each resistor.



$$V_4 = I_4 R_4$$

$$V_4 = (0.14\,\text{A})(35\,\Omega)$$

$$V_4 = 5\,\text{V}$$

$V_B = 24\,\text{V}$ $R_{25} = 126\,\Omega$

$R_1 = 84\,\Omega$ $R_{325} = 54\,\Omega$

$R_2 = 51\,\Omega$ $R_T = 173\,\Omega$

$R_3 = 96\,\Omega$

$R_4 = 35\,\Omega$

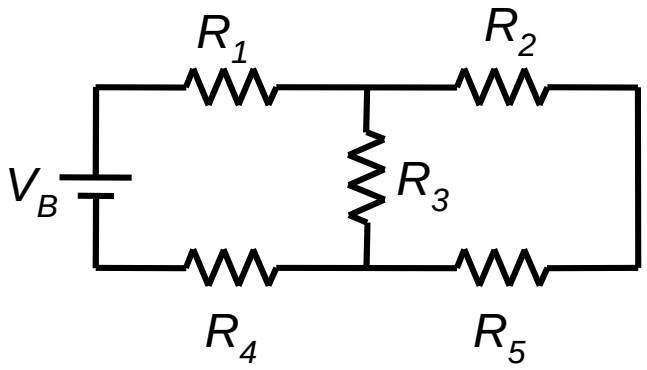
$R_5 = 75\,\Omega$

$I_T = I_1 = I_4 = 0.14\,\text{A}$

$V_1 = 12\,\text{V}$

$V_4 = 5\,\text{V}$

Determine the current through each resistor, the total current and the voltage across each resistor.



$$V_{325} = V_B - V_1 - V_4$$

$$V_{325} = 24\,\text{V} - 12\,\text{V} - 5\,\text{V}$$

$$V_{325} = 7\,\text{V}$$

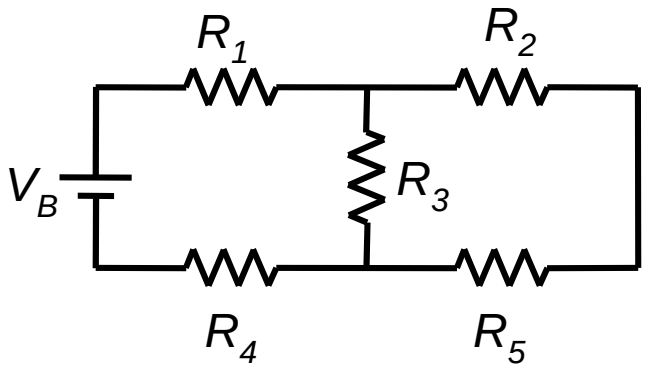
$V_B = 24\,\text{V}$
$R_1 = 84\,\Omega$
$R_2 = 51\,\Omega$
$R_3 = 96\,\Omega$
$R_4 = 35\,\Omega$
$R_5 = 75\,\Omega$

$R_{25} = 126\,\Omega$
$R_{325} = 54\,\Omega$
$R_T = 173\,\Omega$

$I_T = I_1 = I_4 = 0.14\,\text{A}$

$V_1 = 12\,\text{V}$
$V_4 = 5\,\text{V}$
$V_{325} = 7\,\text{V}$

Determine the current through each resistor, the total current and the voltage across each resistor.



Note that $V_{325} = V_3 = V_{25}$.

$V_B = 24\,\text{V}$ $R_{25} = 126\,\Omega$

$R_1 = 84\,\Omega$ $R_{325} = 54\,\Omega$

$R_2 = 51\,\Omega$ $R_T = 173\,\Omega$

$R_3 = 96\,\Omega$

$R_4 = 35\,\Omega$

$R_5 = 75\,\Omega$

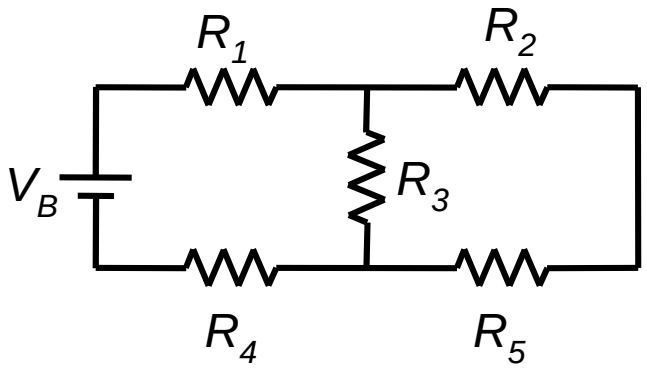
$I_T = I_1 = I_4 = 0.14\,\text{A}$

$V_1 = 12\,\text{V}$

$V_4 = 5\,\text{V}$

$V_{325} = V_3 = V_{25} = 7\,\text{V}$

Determine the current through each resistor, the total current and the voltage across each resistor.



$$I_3 = \frac{V_3}{R_3}$$

$$I_3 = \frac{7\,\text{V}}{96\,\Omega}$$

$$I_3 = 0.07\,\text{A}$$

$V_B = 24\,\text{V}$ $R_{25} = 126\,\Omega$

$R_1 = 84\,\Omega$ $R_{325} = 54\,\Omega$

$R_2 = 51\,\Omega$ $R_T = 173\,\Omega$

$R_3 = 96\,\Omega$

$R_4 = 35\,\Omega$

$R_5 = 75\,\Omega$

$I_T = I_1 = I_4 = 0.14\,\text{A}$

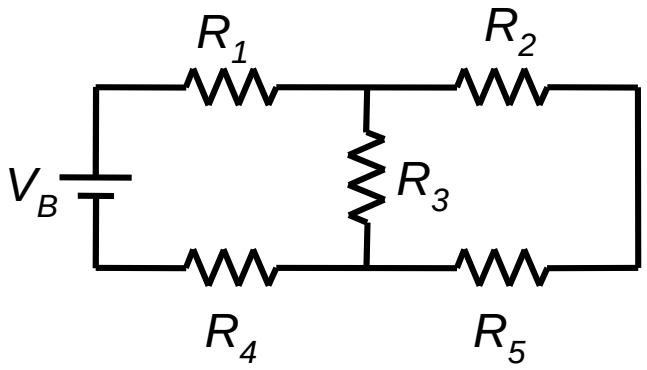
$I_3 = 0.07\,\text{A}$

$V_1 = 12\,\text{V}$

$V_4 = 5\,\text{V}$

$V_{325} = V_3 = V_{25} = 7\,\text{V}$

Determine the current through each resistor, the total current and the voltage across each resistor.



$$I_{25} = \frac{V_{25}}{R_{25}}$$

$$I_{25} = \frac{7\,\text{V}}{126\,\Omega}$$

$$I_{25} = 0.06\,\text{A}$$

$V_B = 24\,\text{V}$ $R_{25} = 126\,\Omega$

$R_1 = 84\,\Omega$ $R_{325} = 54\,\Omega$

$R_2 = 51\,\Omega$ $R_T = 173\,\Omega$

$R_3 = 96\,\Omega$

$R_4 = 35\,\Omega$

$R_5 = 75\,\Omega$

$I_T = I_1 = I_4 = 0.14\,\text{A}$

$I_3 = 0.07\,\text{A}$

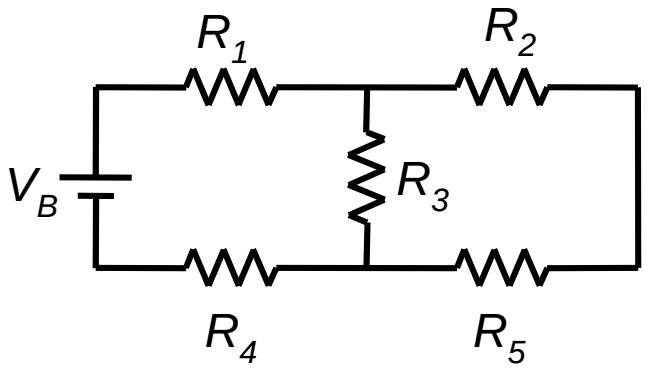
$I_{25} = 0.06\,\text{A}$

$V_1 = 12\,\text{V}$

$V_4 = 5\,\text{V}$

$V_{325} = V_3 = V_{25} = 7\,\text{V}$

Determine the current through each resistor, the total current and the voltage across each resistor.



Note that $I_{25} = I_2 = I_5$.

$V_B = 24\,\text{V}$ $R_{25} = 126\,\Omega$

$R_1 = 84\,\Omega$ $R_{325} = 54\,\Omega$

$R_2 = 51\,\Omega$ $R_T = 173\,\Omega$

$R_3 = 96\,\Omega$

$R_4 = 35\,\Omega$

$R_5 = 75\,\Omega$

$I_T = I_1 = I_4 = 0.14\,\text{A}$

$I_3 = 0.07\,\text{A}$

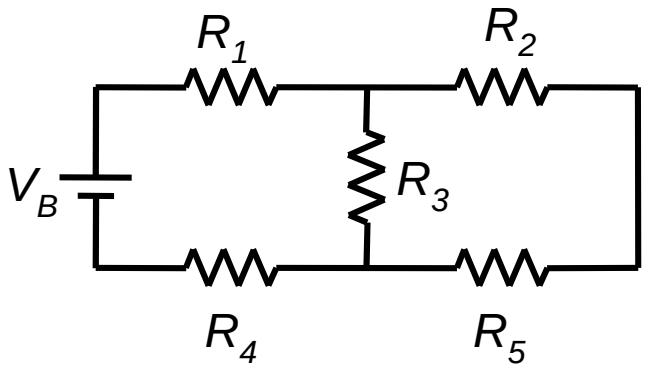
$I_{25} = I_2 = I_5 = 0.06\,\text{A}$

$V_1 = 12\,\text{V}$

$V_4 = 5\,\text{V}$

$V_{325} = V_3 = V_{25} = 7\,\text{V}$

Determine the current through each resistor, the total current and the voltage across each resistor.



$$V_2 = I_2 R_2$$

$$V_2 = (0.06\,\text{A})(51\,\Omega)$$

$$V_2 = 3\,\text{V}$$

$V_B = 24\,\text{V}$ $R_{25} = 126\,\Omega$

$R_1 = 84\,\Omega$ $R_{325} = 54\,\Omega$

$R_2 = 51\,\Omega$ $R_T = 173\,\Omega$

$R_3 = 96\,\Omega$

$R_4 = 35\,\Omega$

$R_5 = 75\,\Omega$

$I_T = I_1 = I_4 = 0.14\,\text{A}$

$I_3 = 0.07\,\text{A}$

$I_{25} = I_2 = I_5 = 0.06\,\text{A}$

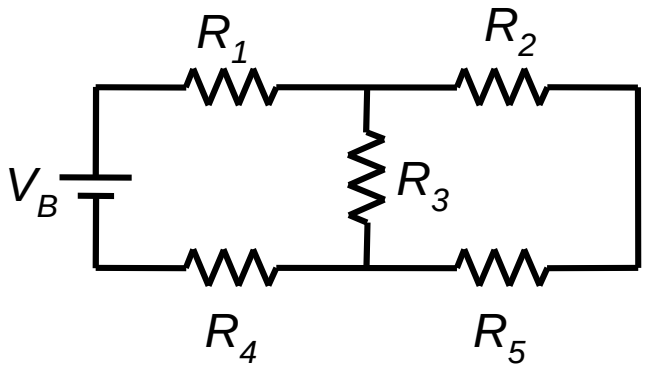
$V_1 = 12\,\text{V}$

$V_4 = 5\,\text{V}$

$V_{325} = V_3 = V_{25} = 7\,\text{V}$

$V_2 = 3\,\text{V}$

Determine the current through each resistor, the total current and the voltage across each resistor.



$$V_5 = I_5 R_5$$

$$V_5 = (0.06\,\text{A})(75\,\Omega)$$

$$V_5 = 5\,\text{V}$$

$V_B = 24\,\text{V}$ $R_{25} = 126\,\Omega$

$R_1 = 84\,\Omega$ $R_{325} = 54\,\Omega$

$R_2 = 51\,\Omega$ $R_T = 173\,\Omega$

$R_3 = 96\,\Omega$

$R_4 = 35\,\Omega$

$R_5 = 75\,\Omega$

$I_T = I_1 = I_4 = 0.14\,\text{A}$

$I_3 = 0.07\,\text{A}$

$I_{25} = I_2 = I_5 = 0.06\,\text{A}$

$V_1 = 12\,\text{V}$

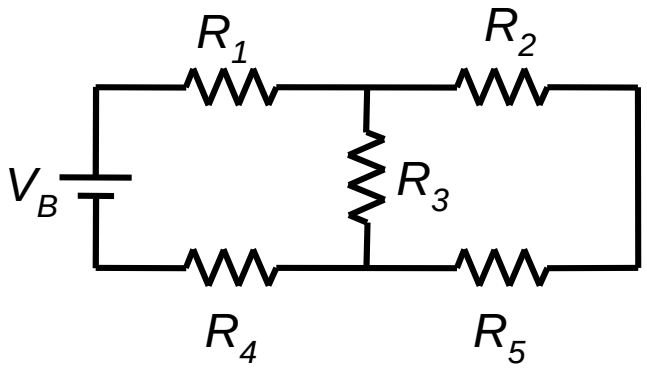
$V_4 = 5\,\text{V}$

$V_{325} = V_3 = V_{25} = 7\,\text{V}$

$V_2 = 3\,\text{V}$

$V_5 = 5\,\text{V}$

Determine the current through each resistor, the total current and the voltage across each resistor.



Note that $V_3 = V_2 + V_5$ and $I_1 = I_3 + I_{25}$. (within uncertainty)

$V_B = 24\,\text{V}$ $R_{25} = 126\,\Omega$

$R_1 = 84\,\Omega$ $R_{325} = 54\,\Omega$

$R_2 = 51\,\Omega$ $R_T = 173\,\Omega$

$R_3 = 96\,\Omega$

$R_4 = 35\,\Omega$

$R_5 = 75\,\Omega$

$I_T = I_1 = I_4 = 0.14\,\text{A}$

$I_3 = 0.07\,\text{A}$

$I_{25} = I_2 = I_5 = 0.06\,\text{A}$

$V_1 = 12\,\text{V}$

$V_4 = 5\,\text{V}$

$V_{325} = V_3 = V_{25} = 7\,\text{V}$

$V_2 = 3\,\text{V}$

$V_5 = 5\,\text{V}$