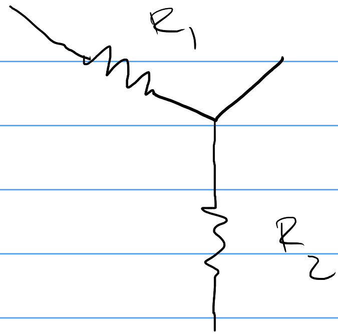
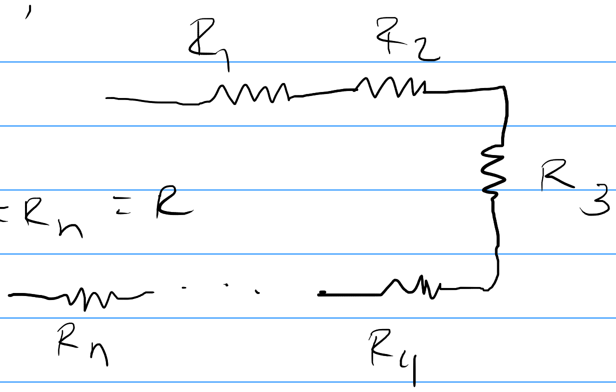


$R_T = R_1 + R_2 + R_3 + R_4$

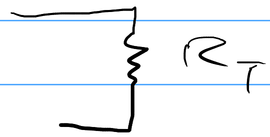
$= {}^{n}\sum R$



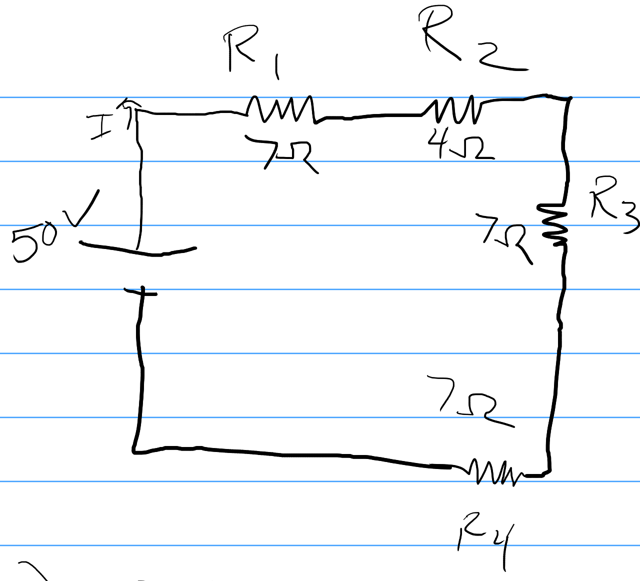
if $R_1 = R_2 = R_3 \ldots = R_n = R$

$R_T = NR$

Pdelivered = Sum of all consumed

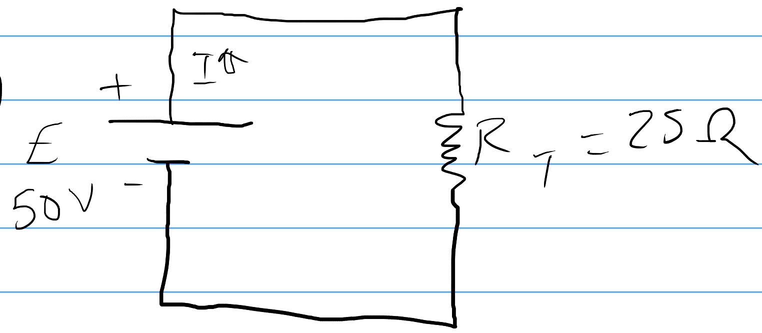


$$R_T = R_1 + R_2 + R_3 + R_4$$
$$= 7\Omega + 4\Omega + 7\Omega + 7\Omega$$
$$= 25\,\Omega$$
$$I = \frac{E}{R_T} = \frac{50V}{25\Omega} = 2A$$



$$V_2 = I \cdot R_2 = (2A)(4\Omega) = 8V$$

$$P_E = V \cdot I = (50V)\cdot(2A) = 100W$$



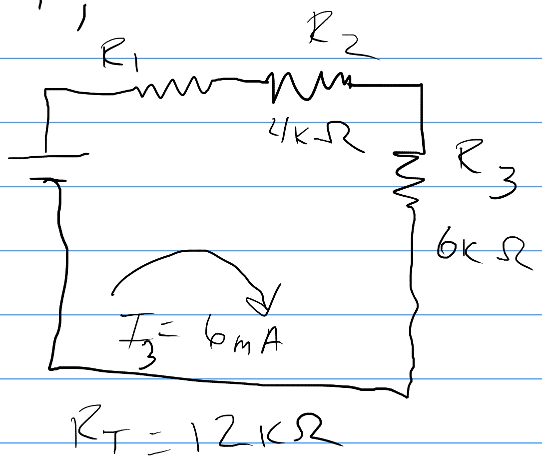
$$P_{R_1} = V_1 I = I^2 R_1 = \frac{V_1^2}{R_1}$$
$$P_{R_1} = (2)^2 (7) = 28W$$
$$P_{R_2} = V_2 I = (8)(2) = 16W$$

$$P_{R_3} = P_{R_1} = 28W$$

$$P_{R_4} = P_{R_2} = 28W$$

$$\boxed{P_{del} + P_{R_1} + P_{R_2} + P_{R_3} + P_{R_4}}$$

Given R_T find I, R_1, E



$12k\Omega = 6k\Omega + 4k\Omega + R_1$

$12k\Omega = 10k\Omega + R_1$

$-10k\Omega \quad -10k\Omega$

$R_1 = 2k\Omega$

Because in series

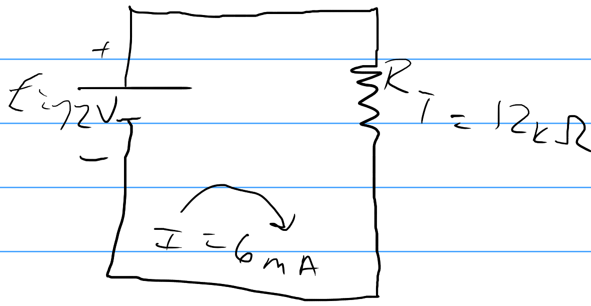
$I_3 = I = 6mA$

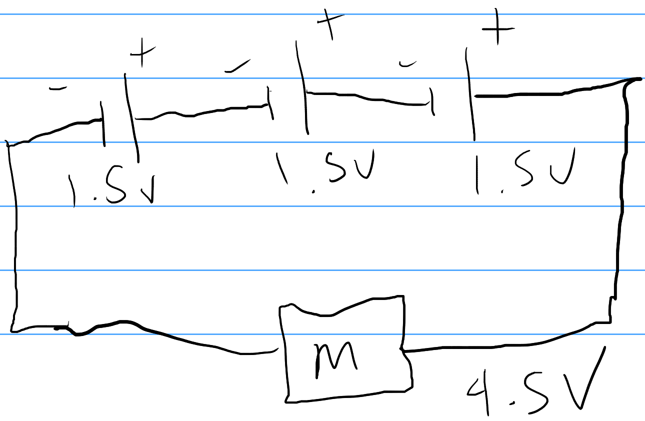
$E = IR$

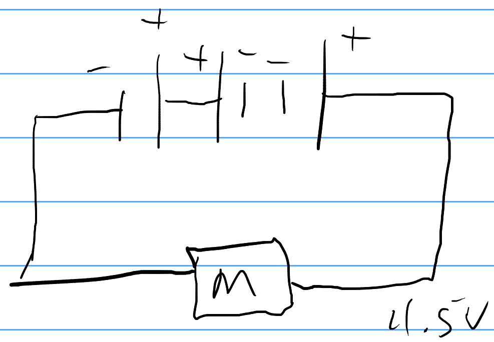
$E = 6mA \cdot 12k\Omega$

$E = .006A \cdot 12000\ \Omega$

$E = 72V$

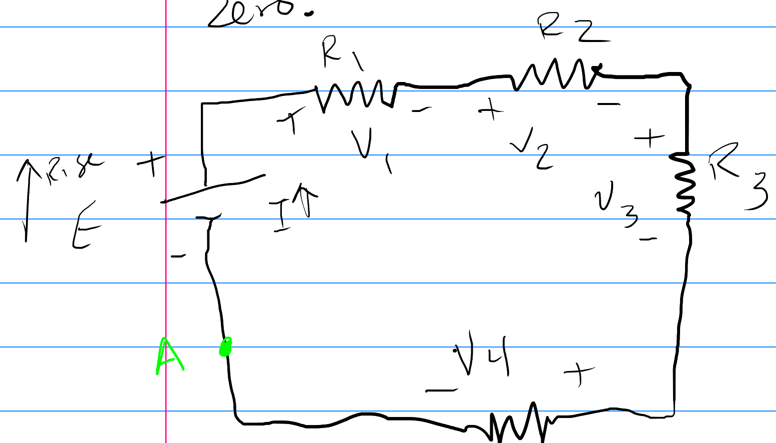


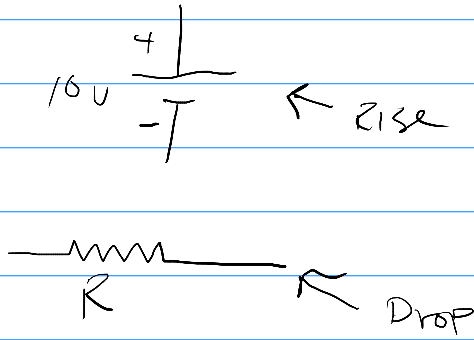




Kirchoff's Voltage law (KVL)

The algebraic sum of the potential rises and drops around a closed loop (Path) is zero.



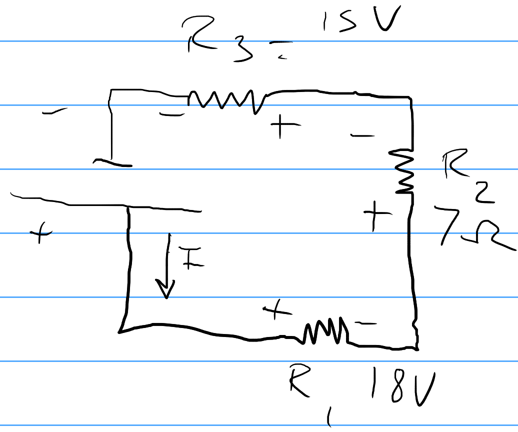


$-E + V_1 + V_2 + V_3 + V_4 = 0$

Sum of all rises = Sum of all drops

Example:

Find I of V_2



$54V = V_1 + V_2 + V_3$

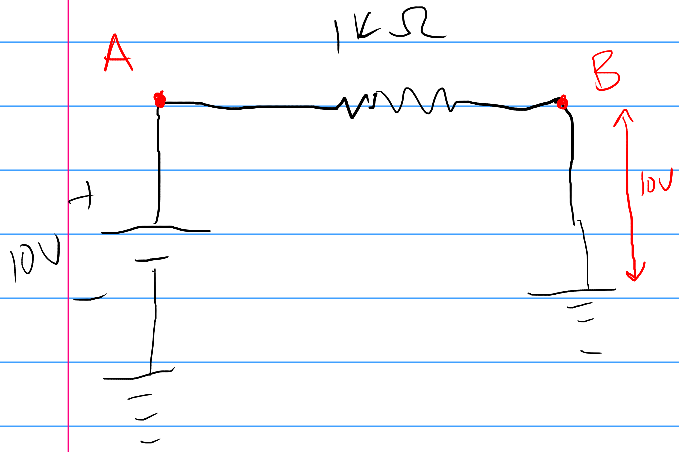
$= 18V + V_2 + 15V$

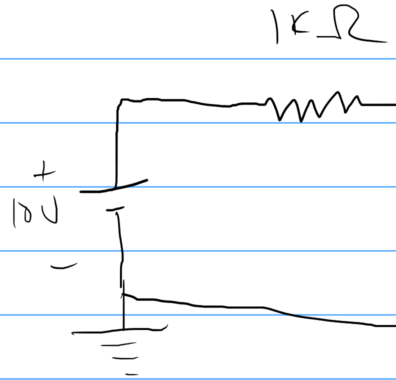
$V_2 = 21V$

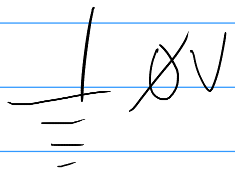
$V_2 = I \cdot R_2 = \frac{V_2}{R_2} = \frac{21V}{7\Omega} = 3A$

$V_1 = I \cdot R_1 \quad R_1 = \frac{V_1}{I} = \frac{18V}{3A} = 6\Omega$

$R3 = \frac{V_3}{I} = \frac{15V}{3A} = 5\Omega$







Single Subscript notation: V_a, V_b

V_a: the voltage of node A with respect to ground

Double Subcript notation: V_{ab}

V_{ab} = Voltage of point a with respect to point b

$$V_{ab} = V_a - V_b$$