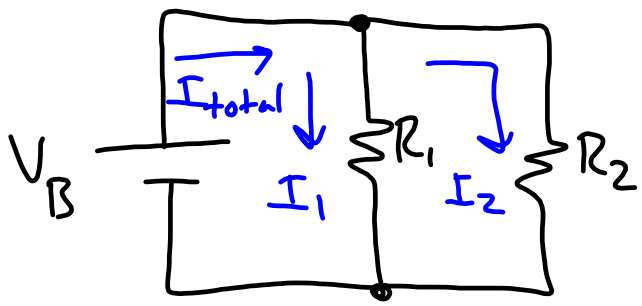
Practice - Circuits

- Electric Power → amount of energy used per given time in an individual piece or throughout the total circuit

- Calculate

$$P = IV = I^2R = \frac{V^2}{R}$$

(using $V = IR$)



$I_1 = 3A$

$R_1 = 5\Omega$

$R_2 = 10\Omega$

Find $I_{total}, V_B, I_2, V_2, P_{total}, P_1, P_2$

$V_1 = I_1 R_1 = (3A)(5\Omega) = 15V$

$V_1 = V_2 = V_B$

$V_B = 15V$ $V_2 = 15V$

$I_2 = \frac{V_2}{R_2} = \frac{15V}{10\Omega} = 1.5A$

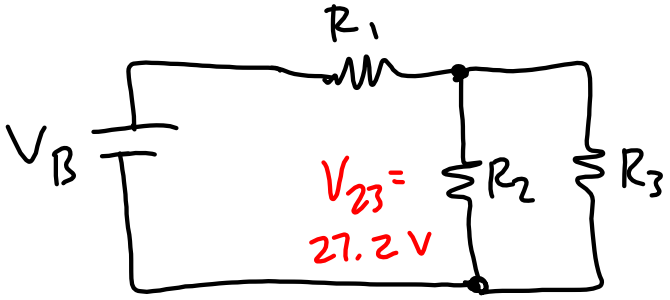
$I_{total} = I_1 + I_2$

$= 3A + 1.5A = 4.5A$

$P_{total} = V_B I_{total} = (15V)(4.5A) = 67.5W$

$P_1 = V_1 I_1 = (15V)(3A) = 45W$

$P_2 = V_2 I_2 = (15V)(1.5A) = 22.5W$



$V_B = 100\ V$

$R_1 = 20\Omega$

$R_2 = 10\Omega$

$R_3 = 30\Omega$

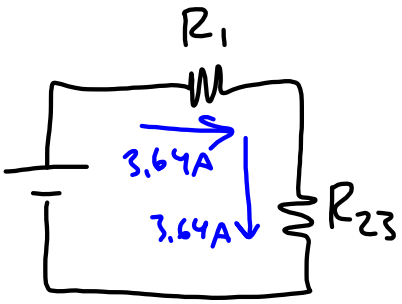
Find V_1, V_2, V_3

I_1, I_2, I_3

P_1, P_2, P_3

$I_2 = \frac{V_{23}}{R_2} = \frac{27.2V}{10\Omega} = 2.72\ A$

$I_3 = \frac{V_{23}}{R_3} = 0.90\ A$



$\frac{1}{R_{23}} = \frac{1}{R_2} + \frac{1}{R_3}$

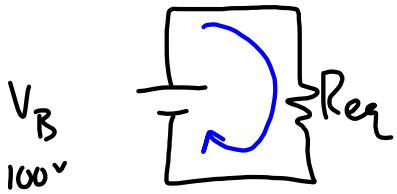
$R_{23} = 7.5\Omega$

$V_1 = I_{total} R_1$

$= (3.64A)(20\Omega)$

$= 72.8V$

$V_{23} = 27.2V$



$R_{eq} = R_1 + R_{23}$

$= 27.5\Omega$

$I_{total} = \frac{V_B}{R_{eq}} = 3.64\ A$

$P_1 = I_1 V_1 = (3.64A)(72.8V) = 265\ W$

$P_2 = I_2 V_2 = (2.72A)(27.2V) = 74\ W$

$P_3 = I_3 V_3 = 25\ W$