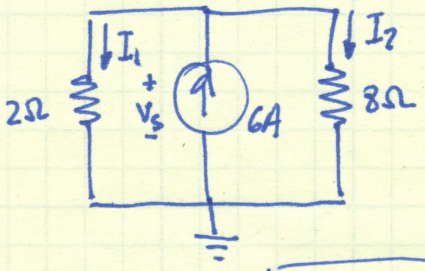
HW #9

8-1



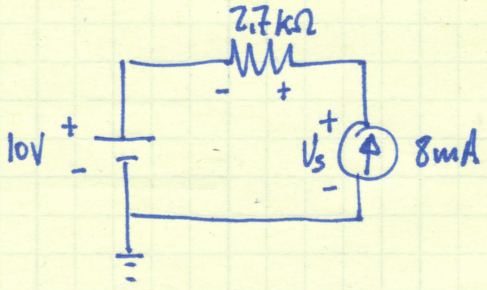
$$I_x = I_T \cdot \frac{R_2}{R_1 + R_2}$$

$$I_1 = 6A \cdot \frac{8\Omega}{2\Omega + 8\Omega} = \boxed{4{,}8\,A = I_1}$$

$$I_2 = I_T - I_1 = 6A - 4{,}8A = \boxed{1{,}2\,A = I_2}$$

$$V_s = I_1 \cdot R_1 = 4{,}8A \cdot 2\Omega = \boxed{9{,}6\,V = V_s}$$

8-3



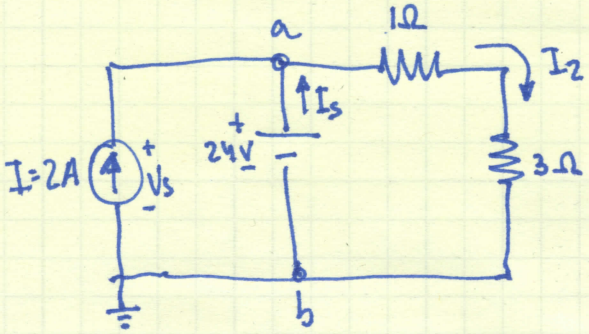
KVL

$$E - V_s + V_R = 0$$

$$V_s = E + V_R = 10\,V + (8mA \cdot 2{,}7k\Omega)$$

$$\boxed{V_s = 31{,}6\,V}$$

8-4



a.) $V_s = E = 24\,V$

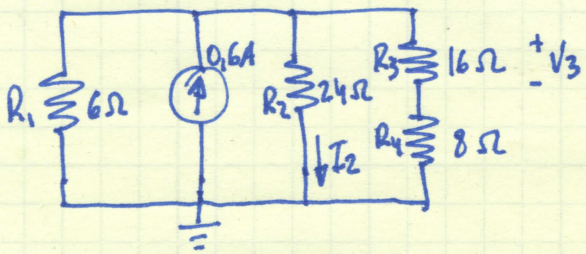
b.) $I_2 = \frac{V_{ab}}{1\Omega + 3\Omega}$

$$I_2 = \frac{24\,V}{4\Omega} = 6A$$

c.) I_s? KCL $\Sigma I_{in} = \Sigma I_{out}$ ⇒ node a

$$2A + I_s = I_2 = 6A \qquad I_s = 6A - 2A = \boxed{4\,A = I_s}$$

8-5



$$V_1 = V_2 = V_s = I \cdot R_T$$

$$R_T = R_1 \parallel R_2 \parallel (R_3 + R_4) =$$

$$= 6\Omega \parallel 24\Omega \parallel 24\Omega = 6\Omega \parallel 12\Omega =$$

$$\boxed{R_T = 4\Omega}$$

$$V_s = I \cdot R_T = 0{,}6A \cdot 4\Omega = \boxed{2{,}4\,V}$$

$$I_2 = \frac{V_2}{R_2} = \frac{2{,}4\,V}{24\Omega} = \boxed{0{,}1A}$$

$$V_3 = V_s \cdot \frac{R_3}{R_3 + R_4} = 2{,}4\,V \cdot \frac{16\Omega}{24\Omega} = \boxed{1{,}6\,V = V_3}$$

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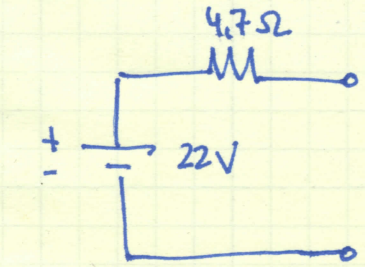
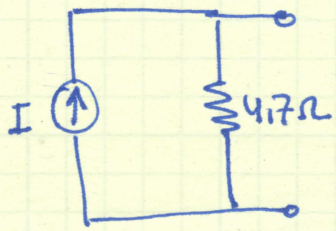
8-7

a.)

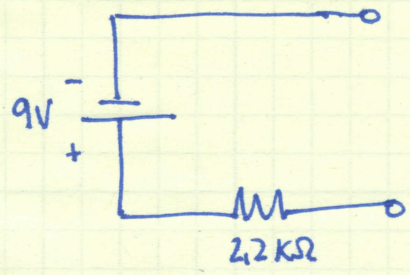


⇒

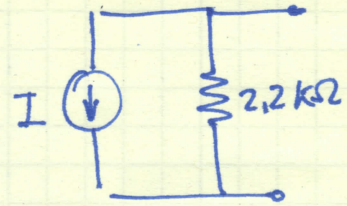


$I = \frac{E}{R} = \frac{22\,V}{4{,}7\,\Omega} = 4{,}68\,A$

b.)



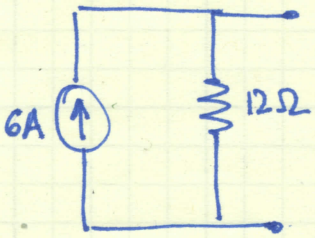
⇒



$I = \frac{E}{R} = \frac{9\,V}{2{,}2\,K\Omega} = 4{,}09\,mA$

8-8

a.)



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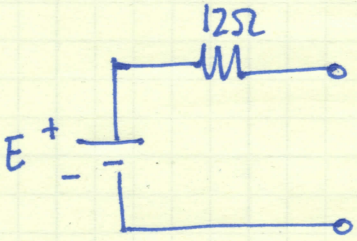
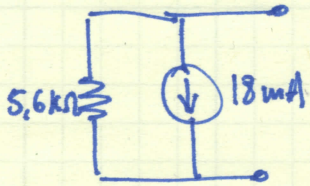


$E = I \cdot R = 6A \cdot 12\Omega = 72\,V$

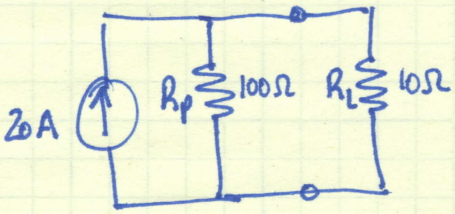
b.)



⇒

$E = I \cdot R = 18\,mA \cdot 5{,}6\,K\Omega = 100.8\,V$

8-9



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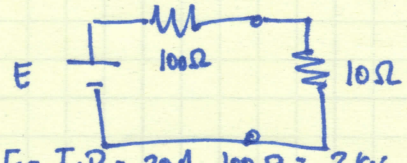

$E = I \cdot R = 20A \cdot 100\,\Omega = 2kV$

~~I = 20A~~
~~R = 100Ω~~
~~E = 0,2V~~

CDR

$$I_L = I_T \cdot \frac{R_p}{R_p + R_L} = 20\,A \cdot \frac{100\,\Omega}{100\Omega + 10\Omega} = \boxed{18{,}2\,A = I_L} \Rightarrow I_L \simeq I_T$$

$$I_L = I_T = \frac{E_T}{R_T} = \frac{2kV}{110\,\Omega} = \frac{2000\,V}{110\,\Omega} = \boxed{18{,}2\,A = I_L}$$

Same current

TOPS
35500