

1. Given: currents & resistance

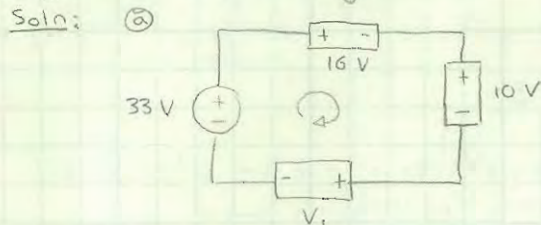
Reqd: voltage \rightarrow magnitude & sign

Soln: (a) $V = IR$
 $V = (3A)(10\Omega)$
 $V = 30V$

(b) $V = IR$
 $V = (6A)(15\Omega)$
 $V = -90V$

5. Given: voltages

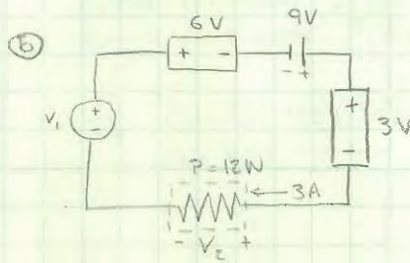
Reqd: unknown voltages



$$33V - 16V - 10V - V_1 = 0$$

$$V_1 = 33 - 16 - 10$$

$$V_1 = 7V$$



$$P = IV_2 \rightarrow V_2 = \frac{P}{I} \rightarrow V_2 = \frac{12W}{3A}$$

$$V_2 = 4V$$

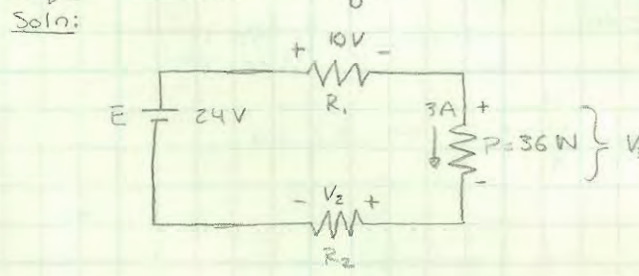
$$V_1 - 6V + 9V - 3V - 4V = 0$$

$$V_1 = 6 - 9 + 3 + 4$$

$$V_1 = 4V$$

7. Given: voltages

Reqd: unknown voltages



$$P = IV_3 \rightarrow V_3 = \frac{P}{I} \rightarrow V_3 = \frac{36W}{3A}$$

$$V_3 = 12V$$

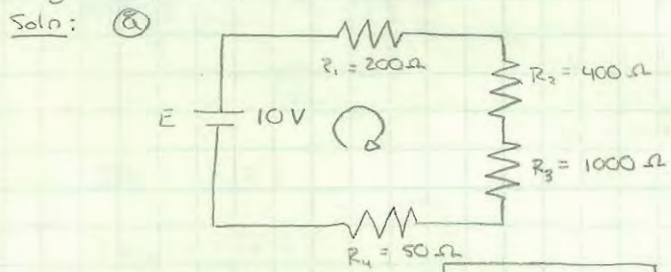
$$24V - 10V - 12V - V_2 = 0$$

$$V_2 = 24 - 10 - 12$$

$$V_2 = 2V$$

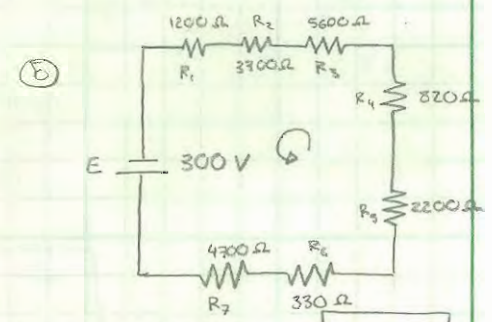
11. Given: resistance & voltage

Reqd: total resistance and current



$$R_t = 1650\Omega \rightarrow R_t = 1.65\text{ k}\Omega$$

$$I = \frac{E}{R_t} \rightarrow I = \frac{10V}{1650\Omega} \rightarrow I = 6.06\text{ mA}$$



$$R_t = 18150\Omega \rightarrow 18.15\text{ k}\Omega$$

$$I = \frac{300V}{18150\Omega} = I = 16.53\text{ mA}$$

3-0235 — 5 SQUARES
 3-0236 — 100 SQUARES — 5 SQUARES
 3-0237 — 200 SQUARES — 5 SQUARES
 3-0137 — 200 SQUARES — FILLER

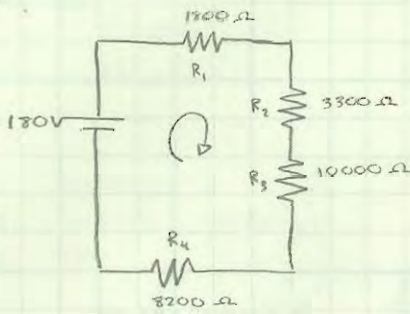
COMET

HW #5

18. Given: resistance

Reqd: total resistance, current, voltage drops, kVL, power dissipated, show $P_{in} = P_{out}$

Soln:



(a) $R_t = 23300 \Omega \rightarrow R_t = 23.3 \text{ k}\Omega$

(b) $I = \frac{E}{R_t} \rightarrow I = \frac{180V}{23300 \Omega} \rightarrow I = 7.73 \text{ mA}$

(c) $V_1 = (.00773 \text{ A})(1800 \Omega) \rightarrow$	$V_1 = 13.9 \text{ V}$
$V_2 = (.00773 \text{ A})(3300 \Omega) \rightarrow$	$V_2 = 25.5 \text{ V}$
$V_3 = (.00773 \text{ A})(10000 \Omega) \rightarrow$	$V_3 = 77.3 \text{ V}$
$V_4 = (.00773 \text{ A})(8200 \Omega) \rightarrow$	$V_4 = 63.4 \text{ V}$

(d) $180V - 13.9V - 25.5V - 77.3V - 63.4V = 0 \quad \checkmark \text{ KVL}$

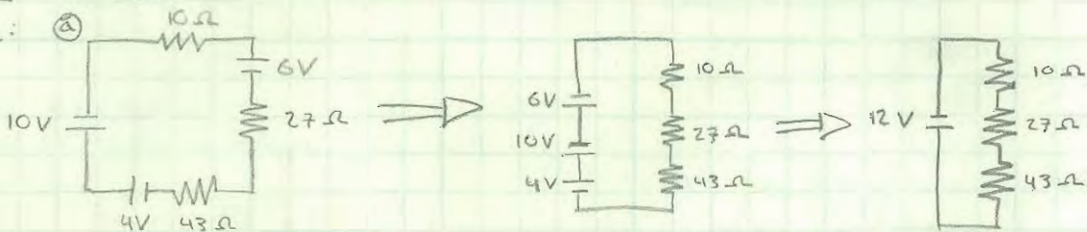
(e) $P = I^2 R_1 \rightarrow P = (.00773 \text{ A})^2 (1800 \Omega) \rightarrow$	$P = 107.6 \text{ mW}$
$R_2 \rightarrow P = (.00773 \text{ A})^2 (3300 \Omega) \rightarrow$	$P = 197.1 \text{ mW}$
$R_3 \rightarrow P = (.00773 \text{ A})^2 (10000 \Omega) \rightarrow$	$P = 597.5 \text{ mW}$
$R_4 \rightarrow P = (.00773 \text{ A})^2 (8200 \Omega) \rightarrow$	$P = 490.0 \text{ mW}$

(f) $P_t = IV \rightarrow P_t = (.00773)(180)$
 $P_t = 1.39 \rightarrow 1.39 = .1076 + .1971 + .5975 + .490$

21. Given: resistance + voltage

Reqd: current

Soln:

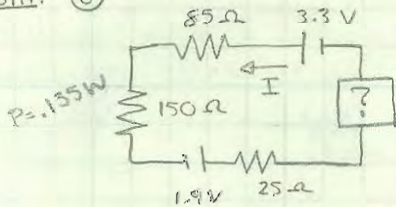


$V = IR \rightarrow I = \frac{V}{R} \rightarrow I = \frac{12V}{80 \Omega} \rightarrow I = .15 \text{ A}$

22. Given: resistance + voltage

Reqd: polarity + magnitude of unknown voltage source

Soln: (b)



$P = I^2 R \rightarrow I^2 = \frac{P}{R} \rightarrow I = \sqrt{\frac{P}{R}}$

$I = .03 \text{ A}$

$V_1 = (.03)(85) = 2.55 \text{ V}$

$V_2 = (.03)(150) = 4.5 \text{ V}$

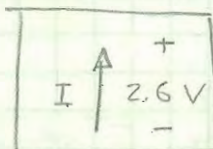
$V_3 = (.03)(25) = .75 \text{ V}$

$\Sigma V_{drops} = 7.8$

$\Sigma V_{gains} = 7.8$

$7.8 = 5.2 + x$

$x = 2.6 \rightarrow$



3-0235 — 50 SHEETS — 5 SQUARES
 3-0236 — 100 SHEETS — 5 SQUARES
 3-0237 — 200 SHEETS — 5 SQUARES
 3-0137 — 200 SHEETS — FILLER

COMET