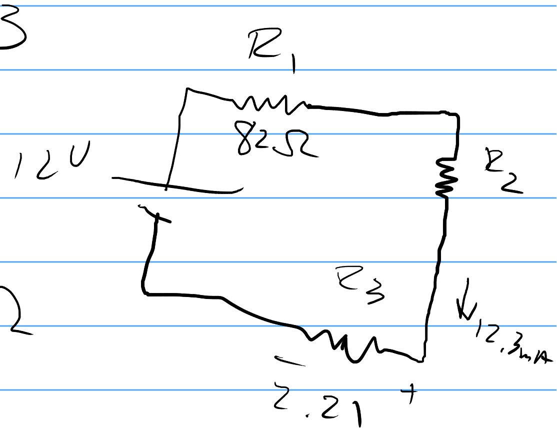
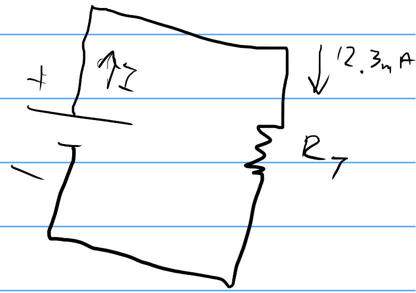
Chapter 5

Determine V_{R_1}, R_2, 3/ R_3



$V = I \cdot R$

$R_3 = \dfrac{V_{R3}}{I} = \dfrac{2.21}{12.3mA} = 180\ \Omega$



$R_T = \dfrac{12}{12.3mA}$

$V_{R_1} = I \cdot R_1 = (12.3mA)(82)$

$-12 + V_{R1} + V_{R2} + V_{R3} = 0$

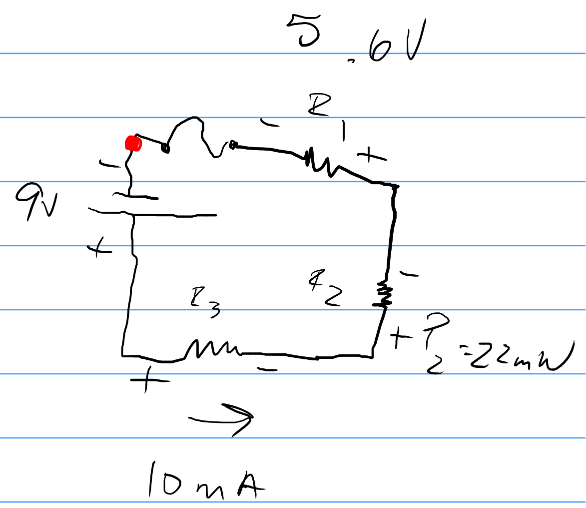
$V_{R_2} = 12 - (82)(12.3mA) - 2.21$

$R_2 = \dfrac{\bigcirc}{12.3mA} = 714\ \Omega$

find R_1, R_2, R_3

3b

$$P_2 = I^2 R_2 = \frac{V_{R_2}}{R_2} = I \cdot V_{R_2}$$



$$R_2 = \frac{P_2}{I^2} = \frac{22mW}{(10mA)^2} = \frac{22 \cdot 10^{-3}}{10 \cdot 10^{-3}}$$

$$= \frac{22 \cdot 10^{-3}}{(0.01)^2} = \frac{22 \cdot 10^{-3}}{10^{-4}} = 22 \cdot 10^{1} = 220\,\Omega$$

$$R_1 = \frac{V_{R_1}}{I} = \frac{5.6}{10mA} = 560\,\Omega$$

R_3 $\quad -9 + V_{R_3} + V_{R_2} + V_{R_1} = 0$

$$V_{R_3} = 9 - V_{R_2} - V_{R_1} = 9 - IR_2 - 5.6$$

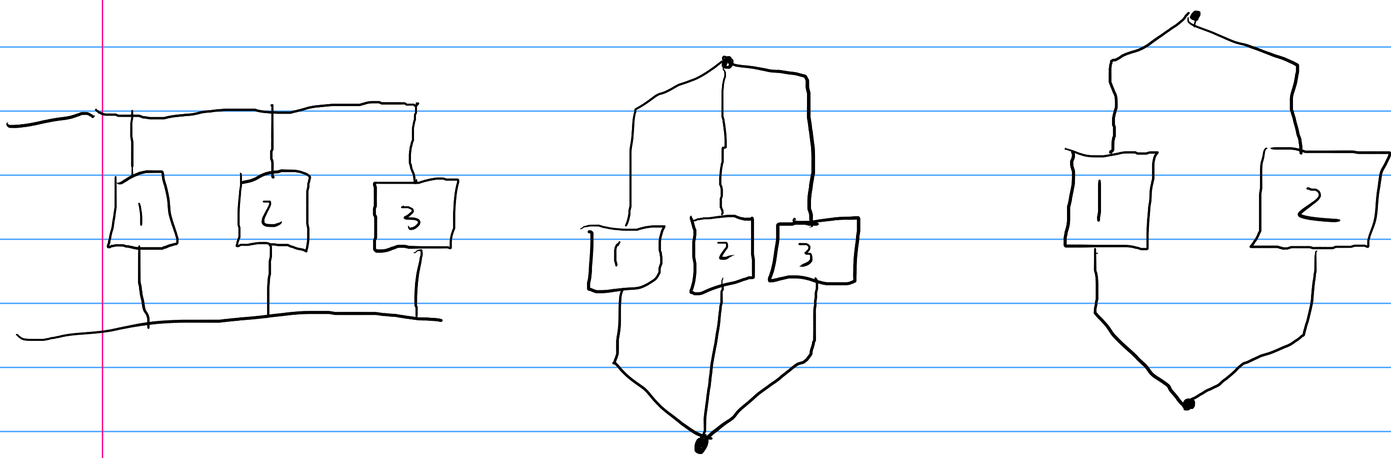
$$= 9 - (10mA)(220\,\Omega) - 5.6$$

$$= 9 - 2.2 - 5.6$$

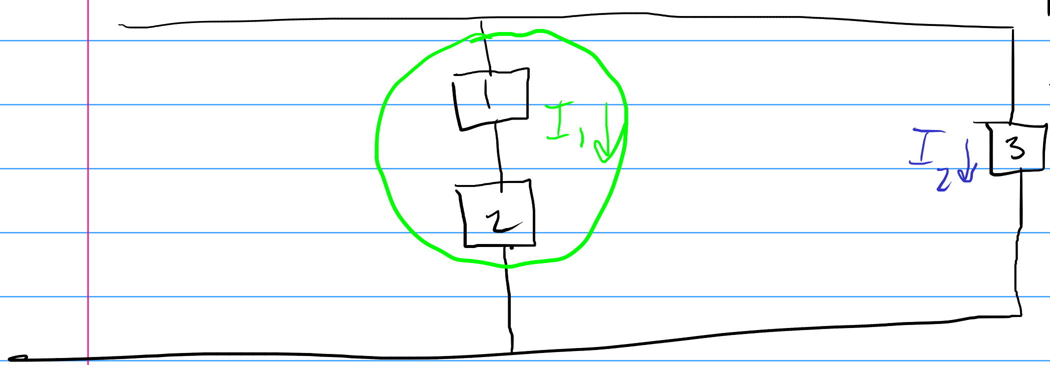
Chapter 6

Parallel circuits

Two elements, branches, or network are in parallel if they have two points in common.



two elements in parallel have the same voltage

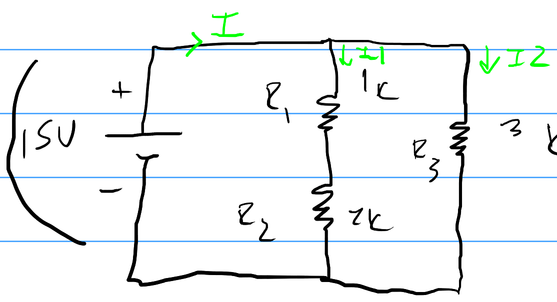


because elements 1 & 2 carry the same current I_1, they are in series

$V_{R_3} = 12V$

$R_3 = 3K$

$I_2 = \frac{V_{R_3}}{R_3} = \frac{12V}{3K} = 4mA$



$I_1 = \frac{15V}{3K} = 5mA$

$$V_{R_1} = I_1 R_1 = (5\,mA)(1k) \quad 1SU$$

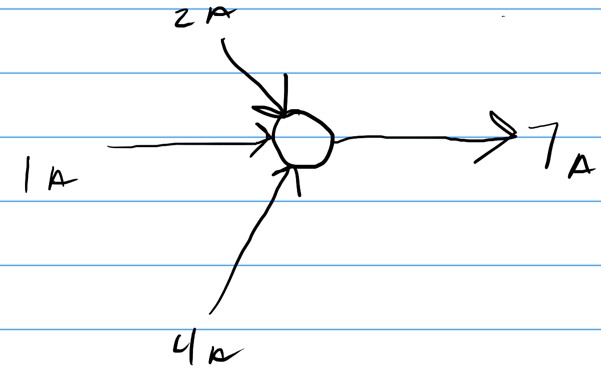
$$= 5V$$

Kirchoff's Current Law (KCL)

The algebraic sum of all currents entering or leaving a junction in zero.

The sum of currents entering a junction must be equal to the sum of currents leaving the junction

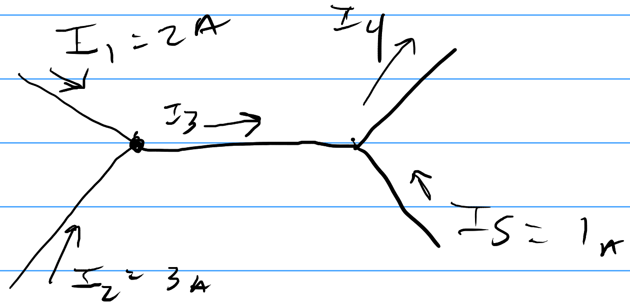
Entering = 2A+1A+4A = 7A



Entering a node = -

Leaving a node = +

-2-1-4+I = 0
I = 2+1+4=7A



I3=I1+I2=3A+2A=5A

I3+I5=I4

5A+1A=I4=6A