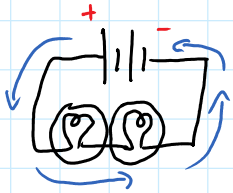
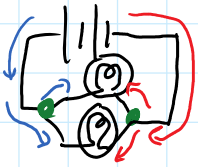
Kirchoffs Law's

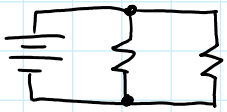
Monday, May 15, 2017 12:45 PM

Series Circuit: - one device is followed by another
- one path for the electrons/current to travel

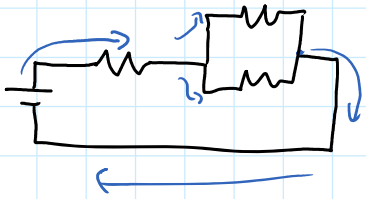


Parallel Circuit - split, junction in circuit
- more than one path for current/electrons

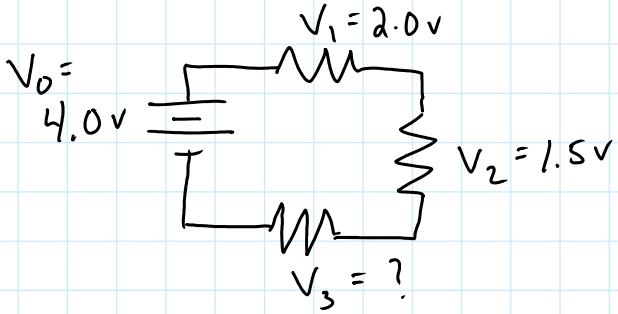




Combo

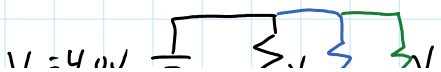


The Voltage Law: The sum of the voltage increases (battery) = the sum of the voltage decrease/drop (light/resistor) for one complete path

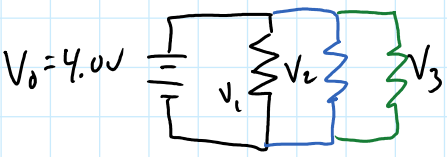


$V_0 = V_1 + V_2 + V_3$

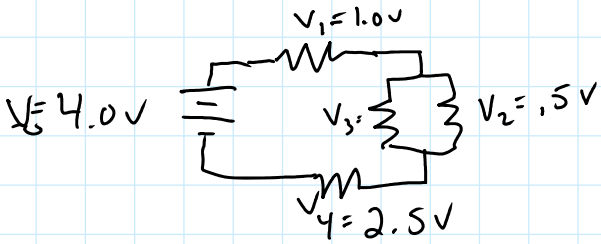
$4.0v = 2.0v + 1.5v + 0.5v$



$V_0 = V_1 + V_2 + V_3 = 4.0v$



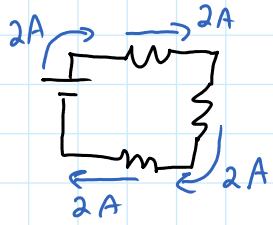
$V_0 = V_1 + V_2 + V_3 = 4.0V$



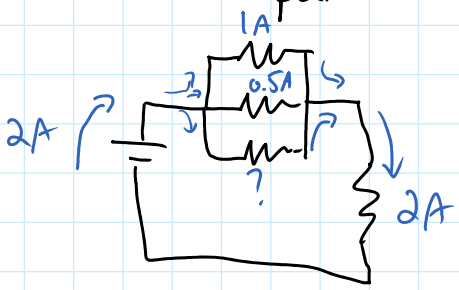
$V_3 = 0.5V$

Current Law

Series: no junction or split, the I out of the source (battery) = I through the entire circuit.

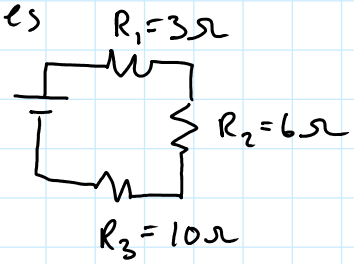


Parallel: Total I into a junction = the sum of the I in each parallel portion



Resistance in a Circuit

Series



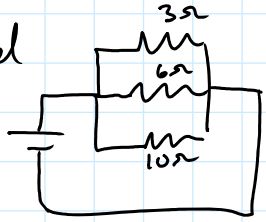
$R_{eq} = R_1 + R_2 + R_3$

$= 3\Omega + 6\Omega + 10\Omega$

$R_{eq} = 19\Omega$

$I = \frac{V}{R}$

Parallel



$I_0 = I_1 + I_2 + I_3$

$\frac{V_0}{R} = \frac{V_1}{R_1} + \frac{V_2}{R_2} + \frac{V_3}{R_3}$

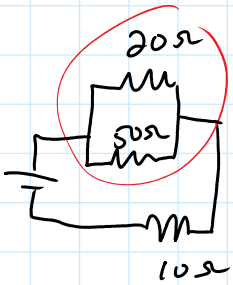
$\frac{1}{R_{eq}} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3} + \dots$

$\frac{1}{R_{eq}} = \frac{1}{3\Omega} + \frac{1}{6\Omega} + \frac{1}{10\Omega}$

$= \frac{10}{30} + \frac{5}{30} + \frac{3}{30}$

$\frac{1}{R_{eq}} = \frac{18}{30}$, $R_{eq} = \frac{30}{18} = 1.67\Omega$

ex



Find R_{eq} for the circuit.

$\frac{1}{20} + \frac{1}{50}$

$\frac{5}{100} + \frac{2}{100} = \frac{7}{100} = \frac{1}{R}$ $R = \frac{100}{7} = 14.3\Omega$

$10 + 14.3\Omega$

$R_{eq} = 24.3\Omega$

P1 & 3 of booklet.

P.1 a) 10Ω
b) 0.8Ω
c) 4Ω
d) 7Ω
e) $.69\Omega$
f) 2.7Ω

P.3 1) B
2) 4.0 C
3) I - X, C - Y
4) $V_1 = 5V$, $V_2 = 1V$
5) A
6) C