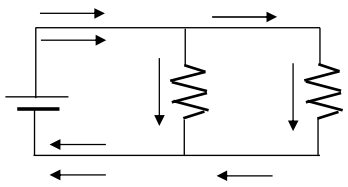
Parallel Circuits

1

Parallel Circuits

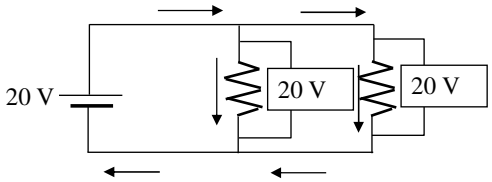
- Circuits in which there are _____ paths for the current to travel.



2

General Rules for Parallel Circuits

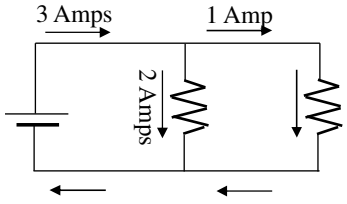
- The voltage drop across each of the branches of a parallel circuit is the same as the rest. (Voltage _____)



3

General Rules for Parallel Circuits

- The sum of all the currents in each branch is equal to the total current in the circuit. (Current _____ Up)



4

Kirchoff's First Law

- The sum of the currents at any junction in a circuit is zero
- Kirchoff's laws summarize the basic principles of all electric circuits—energy and current are conserved

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Resistance in Parallel Circuits

- The equivalent resistance of resistors in parallel can be found by:

$$\frac{1}{R_{eq\ (parallel)}} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3} + etc.$$

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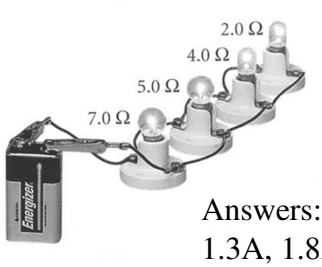
Sample Problem

- A 9.0 V battery is connected to four light bulbs, as shown in the picture.
- What is the equivalent resistance in the circuit?
- What is the total current in the circuit?
- What is the current in each resistor?

	V	I	R
Batt			
R_1			
R_2			
R_3			
R_4			



Answers: 0.92Ω, 9.8A, 1.3A, 1.8A, 2.2A, 4.5A

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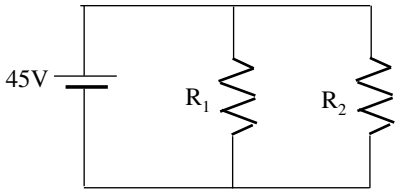
Sample Problem



	V	I	R
Batt	45 V		
R_1		1.5 A	
R_2			10 Ω

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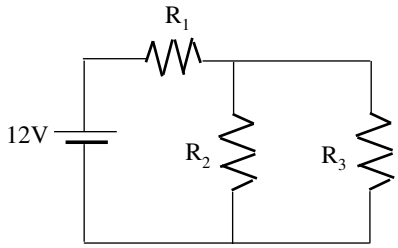
Sample Problem



	V	I	R
Batt	12 V		
R_1	8.0 V		
R_2		4.0 A	
R_3		2.0 A	

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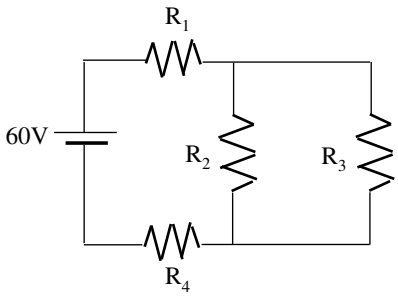
Sample Problem



	V	I	R
Batt	60 V		
R_1	20 V		
R_2		1.2 A	
R_3			30 Ω
R_4		2.0 A	

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