

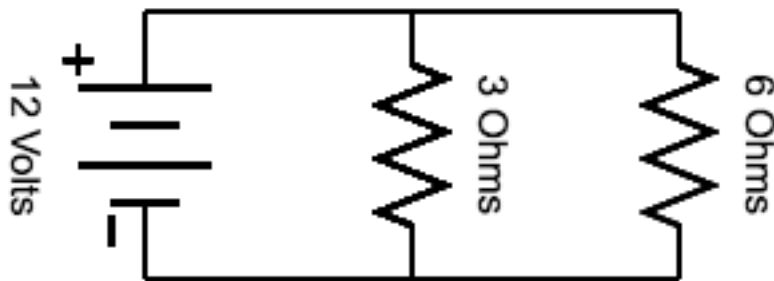
**Part D: Solving Parallel circuit problems**

In a parallel circuit, the rules are slightly different.

**Parallel Circuit Rules:**

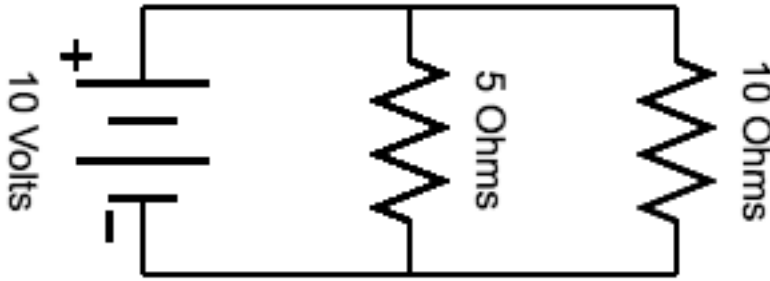
- 1: For each element and the total circuit, the formula  $V = IR$ .
- 2: The *voltage* is the same for every element.
- 3: The *current* adds up to the total for each circuit element.
- 4: The *resistance* DOES NOT add up to the total.

**D.1.** A parallel circuit with a 12-Volt battery, a 3-Ohm resistor, and a 6-Ohm resistor:



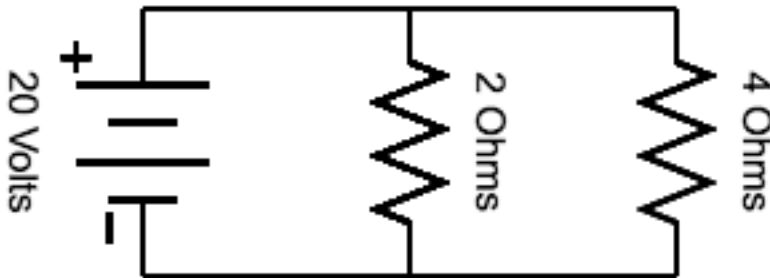
	Resistor 1	Resistor 2	Total Circuit
Voltage (V)			
Current (A)			
Resistance ( $\Omega$ )			

**D.2** a parallel circuit with a 10 Volt battery, a 5-Ohm resistor, and a 10-Ohm resistor:



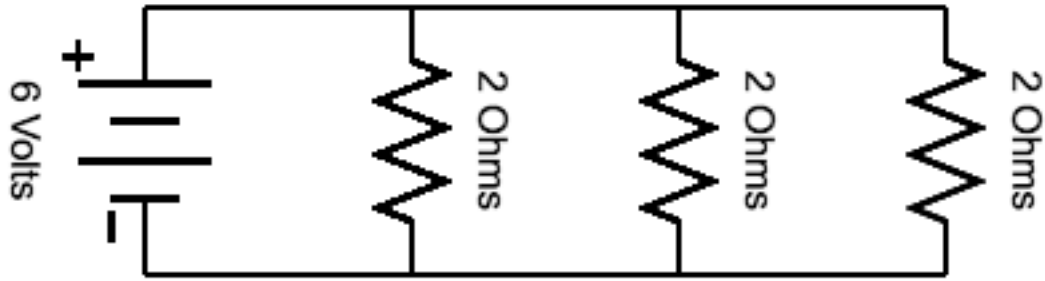
	Resistor 1	Resistor 2	Total Circuit
Voltage (V)			
Current (A)			
Resistance ( $\Omega$ )			

**D.3** a parallel circuit with a 20 Volt battery, a 2 Ohm resistor, and a 4 Ohm resistor:



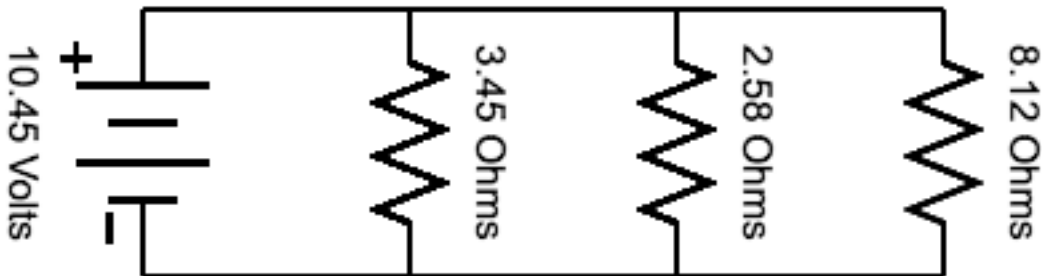
	Resistor 1	Resistor 2	Total Circuit
Voltage (V)			
Current (A)			
Resistance ( $\Omega$ )			

**D.4** A parallel circuit with a 6-volt battery and *three* 2-ohm resistors.



	Resistor 1	Resistor 2	Resistor 3	Total Circuit
Voltage (V)				
Current (A)				
Resistance ( $\Omega$ )				

**D.5** A parallel circuit with a 10.45-volt battery, a 3.45-ohm resistor, a 2.58-ohm resistor, and a 8.12-ohm resistor. [use a calculator, round the answers to two decimal places]



	Resistor 1	Resistor 2	Resistor 3	Total Circuit
Voltage (V)				
Current (A)				
Resistance ( $\Omega$ )				

**D.6** Which rule is the same for series and parallel circuits?

**D.7** Which rules are different for series and parallel circuits?

**Answers:****D.1**

	Resistor 1	Resistor 2	Total Circuit
Voltage (V)	12	12	12
Current (A)	4	2	6
Resistance ( $\Omega$ )	3	6	2

**D.2**

	Resistor 1	Resistor 2	Total Circuit
Voltage (V)	10	10	10
Current (A)	2	1	3
Resistance ( $\Omega$ )	5	10	3.33

**D.3**

	Resistor 1	Resistor 2	Total Circuit
Voltage (V)	20	20	20
Current (A)	10	5	15
Resistance ( $\Omega$ )	2	4	1.33

**D.4**

	Resistor 1	Resistor 2	Resistor 3	Total Circuit
Voltage (V)	6	6	6	6
Current (A)	3	3	3	9
Resistance ( $\Omega$ )	2	2	2	0.667

**D.5**

	Resistor 1	Resistor 2	Resistor 3	Total Circuit
Voltage (V)	10.45	10.45	10.45	10.45
Current (A)	3.03	4.05	1.29	8.37
Resistance ( $\Omega$ )	3.45	2.58	8.12	1.25

All results are rounded to three significant figures.

**D.6** Ohm's Law applies to both series and parallel circuits.

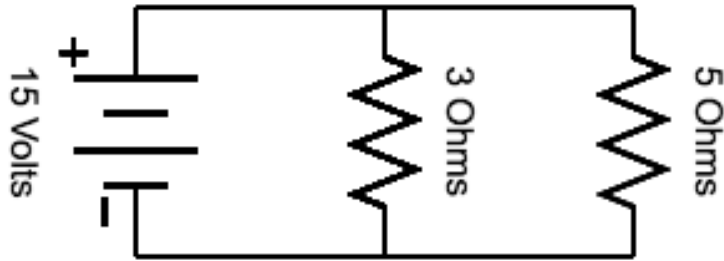
**D.7** In a series circuit, voltage adds and current is constant.

In a parallel circuit, current adds, and voltage is constant

In a series circuit, resistance adds up, while it does not in a parallel circuit.

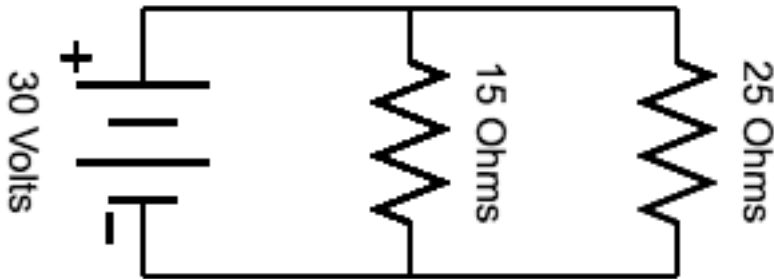
Name \_\_\_\_\_

**F.3** A *parallel* circuit has a 15-volt battery, a 3-ohm resistor and a 5-ohm resistor.



	Resistor 1	Resistor 2	Total Circuit
Voltage (V)			
Current (A)			
Resistance ( $\Omega$ )			
Power (W)			

**F.4** A *parallel* circuit has a 30-volt battery, a 15-ohm resistor and a 25-ohm resistor.



	Resistor 1	Resistor 2	Total Circuit
Voltage (V)			
Current (A)			
Resistance ( $\Omega$ )			
Power (W)			

Name \_\_\_\_\_

Answers

**F.3**

	Resistor 1	Resistor 2	Total Circuit
Voltage (V)	15	15	15
Current (A)	5	3	8
Resistance ( $\Omega$ )	3	5	1.875
Power (W)	75	45	120

**F.4**

	Resistor 1	Resistor 2	Total Circuit
Voltage (V)	30	30	30
Current (A)	2	1.2	3.2
Resistance ( $\Omega$ )	15	25	9.375
Power (W)	60	36	96