I: Solve Simple Circuits with Nontraditional Information
Level 5
Prerequisite: Solve Complete Circuits
Points To: Solve Circuits with Symbolic Algebra; Solve Combined Circuits One-Step

Objectives:

- You are given a circuit with 2 -4 resistors and a battery. The circuits are either series or parallel.

- You need to solve for the voltage, current, resistance, and power of each element of the circuit and the full circuit.

- the information given is NOT the same as the last quiz. That is, NOT only total voltage and each resistance. Different information is given for each circuit and you need to use the logical rules to figure out the result using logical rules.

- The formulas are NOT written on this quiz, so you need to have them memorized by now.

Part A. Non-traditional information circuit problems.
Typically, when presented with problems on electrical circuits, the known information is the voltage of the battery and the resistance of each resistor, because these pieces of information can easily be read of the side of the batteries and resistors. However, it will help you better understand the logical rules of electric circuits if you can solve problems with different pieces of information. For each of the following circuits with a battery and three resistors, solve the problem below:

[Note: This is largely a mathematical exercise, so I selected numbers that would make the math work out in integers of simple decimals. My hope is that you can do this without a calculator. Because I wanted to pick numbers that wouldn't require a calculator, many of the circuits have very high voltage and current, and if they were built in real life would be extremely dangerous! This is one time you should be happy to get a math problem that's just a math problem!]

A.1. Series Circuit:

	Resistor A	Resistor B	Resistor C	Total
Voltage (V)		2	4	
Current (A)		2		
Resistance (Ω)	6			
Power (W)				

A.2. Series Circuit:

	Resistor A	Resistor B	Resistor C	Total
Voltage (V)		6	6	21
Current (A)				
Resistance (Ω)		2		
Power (W)				

A.3. Series Circuit:

	Resistor A	Resistor B	Resistor C	Total
Voltage (V)		**14**	**6**	**22**
Current (A)				
Resistance (Ω)				
Power (W)		**28**		

A.4. Series Circuit:

	Resistor A	Resistor B	Resistor C	Total
Voltage (V)		**3**	**1**	
Current (A)				
Resistance (Ω)			**2**	**12**
Power (W)	**1**			

A.5 Coming Soon!

A.6. Parallel Circuit

	Resistor A	Resistor B	Resistor C	Total
Voltage (V)		**18**		
Current (A)			**6**	
Resistance (Ω)	**6**			
Power (W)		**54**		

A.7. Parallel Circuit

	Resistor A	Resistor B	Resistor C	Total
Voltage (V)				
Current (A)				3
Resistance (Ω)		15		5
Power (W)	15		15	

A.8. Parallel Circuit

	Resistor A	Resistor B	Resistor C	Total
Voltage (V)				
Current (A)		4		16
Resistance (Ω)	2	4		
Power (W)				

A.9. Parallel Circuit

	Resistor A	Resistor B	Resistor C	Total
Voltage (V)				
Current (A)			4	
Resistance (Ω)	14			
Power (W)	56			196

A.10. Parallel Circuit

	Resistor A	Resistor B	Resistor C	Total
Voltage (V)				
Current (A)	1	1		4
Resistance (Ω)				
Power (W)			32	

Answers:

A.1. Series Circuit:

	Resistor A	Resistor B	Resistor C	Total
Voltage (V)	12	2	4	18
Current (A)	2	2	2	2
Resistance (Ω)	6	1	2	9
Power (W)	24	4	8	36

A.2. Series Circuit:

	Resistor A	Resistor B	Resistor C	Total
Voltage (V)	9	6	6	21
Current (A)	3	3	3	3
Resistance (Ω)	3	2	2	7
Power (W)	27	18	18	63

A.3. Series Circuit:

	Resistor A	Resistor B	Resistor C	Total
Voltage (V)	2	14	6	22
Current (A)	2	2	2	2
Resistance (Ω)	1	7	3	11
Power (W)	4	28	12	44

A.4. Series Circuit:

	Resistor A	Resistor B	Resistor C	Total
Voltage (V)	2	3	1	6
Current (A)	0.5	0.5	0.5	0.5
Resistance (Ω)	4	6	2	12
Power (W)	1	1.5	0.5	3

A.5

A.6. Parallel Circuit

	Resistor A	Resistor B	Resistor C	Total
Voltage (V)	18	18	18	18
Current (A)	3	3	6	12
Resistance (Ω)	6	6	3	1.5
Power (W)	54	54	108	216

A.7. Parallel Circuit

	Resistor A	Resistor B	Resistor C	Total
Voltage (V)	15	15	15	15
Current (A)	1	1	1	3
Resistance (Ω)	15	15	15	5
Power (W)	15	15	15	45

A.8. Parallel Circuit

	Resistor A	Resistor B	Resistor C	Total
Voltage (V)	16	16	16	16
Current (A)	8	4	4	16
Resistance (Ω)	2	4	4	1
Power (W)	128	64	64	256

A.9. Parallel Circuit

	Resistor A	Resistor B	Resistor C	Total
Voltage (V)	28	28	28	28
Current (A)	2	1	4	7
Resistance (Ω)	14	28	7	4
Power (W)	56	28	112	196

A.10. Parallel Circuit

	Resistor A	Resistor B	Resistor C	Total
Voltage (V)	16	16	16	16
Current (A)	1	1	2	4
Resistance (Ω)	16	16	8	4
Power (W)	16	16	32	64