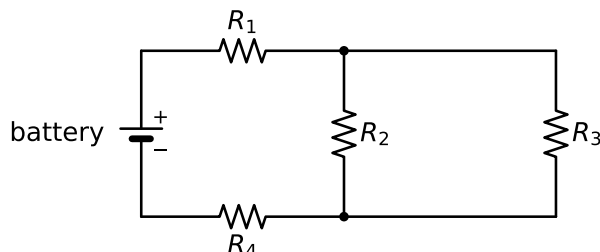


Part A: Finding the Groups

1. Use the circuit below to answer each question.



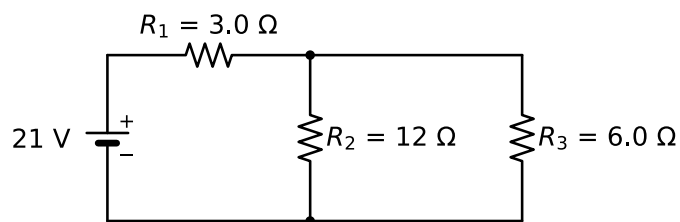
- Which resistors carry the total current from the battery? How do you know?
- Which resistors are in parallel with each other? What do they have in common?
- R_3 is removed, leaving a gap in its branch. Does the circuit still work? What happens to the total resistance and the total current?

Part B: Solving Combination Circuits

Show your equations, substitutions, and answers with units.

- A 12 V battery is connected to two branches in parallel. Branch A has $R_1 = 2.0 \, \Omega$ and $R_2 = 4.0 \, \Omega$ in series. Branch B has $R_3 = 12 \, \Omega$.
 - Draw the circuit diagram.
 - Find the total resistance and the total current from the battery.
 - Find the current in each branch and the voltage across R_1 and R_2 .

3. For the circuit shown, find each quantity.



- the equivalent resistance of the parallel group, R_{23}
- the total resistance and the total current
- the voltage across R_1 and across the parallel group
- the current through R_2 and through R_3
- Check your answers with the junction rule and the loop rule.

4. Complete the solving table for the circuit shown. Show your work below.

	$R\ (\Omega)$	$I\ (A)$	$V\ (V)$
R_1	4.0		
R_2	15		
R_3	10.		
Total			20.

