

PHY2250, Electronics & Circuit Theory

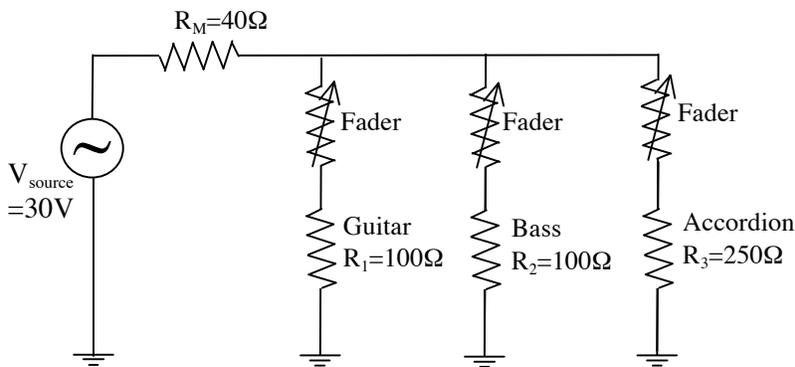
Activity: Series-Parallel Circuits.

Work in groups of three (or two). You may refer to your notes and your textbook.

Below is a **5-Step Process for Analyzing Series-Parallel Circuits** (from Cook, p.154):

1. Determine the circuit's total resistance.
 - a. Solve for the series-connected resistors in all parallel combinations
 - b. Solve for all parallel combinations
 - c. Solve for all remaining series resistances.
2. Determine the circuit's total current.
3. Determine the voltage across each series resistor and each parallel combination (series equivalent resistor).
4. Determine the value of the current through each parallel resistor in every parallel combination
5. Determine the total and individual power dissipated by the circuit.

In the following "pseudo-cue-system," three instrument channels are placed in parallel, and each channel has a fader (represented by variable resistors).



1. Say the guitar channel's fader is "all the way on", i.e. zero resistance, and the other two faders are turned "off," i.e. "infinite" resistance.
 - a. What is the total resistance of the circuit?
 - b. What is the current that flows through the guitar channel?
 - c. What is the voltage across the guitar?
2. Now suppose the bass channel's fader is also turned all the way on....
 - a. What is the total resistance of the circuit?
 - b. What is the current through the guitar channel now?
 - c. What is the voltage across the guitar?
3. Now the accordion channel's fader is turned "on" and the bass channel's fader is turned to 50 Ohms.
 - a. What is the total resistance of the circuit?
 - b. What is the current through the guitar channel now?
 - c. What is the voltage across the guitar?