

Chapter 19 Objectives

1. In analyzing circuits be able to use the fact that the potential difference between two points connected by copper in a functioning circuit is for all practical purposes equal to zero.
2. Be able to identify resistors in a circuit that are in parallel with each other and that are in series with each other, and to explain how one decides.
3. Be able to solve for all the currents and potentials in resistor circuits.
4. Be able to make a schematic diagram of an electric circuit that includes light bulbs or resistors in series and in parallel and to build it.
5. Be able to use an ammeter or current probe in an electric circuit to measure the electrical current flowing through a resistor or light bulb.
6. Be able to use a voltmeter or voltage probe in an electric circuit to measure the difference in potential between the ends of a light bulb or a resistor.
7. Be able to state what is meant by “short circuit”.
8. Be able to state two practical reasons that household circuits are wired in parallel instead of in series.
9. Be able to describe how “overloading” occurs in household circuits.
10. Be able to describe common household electrical hazards and how to be safe.
11. Be able to describe the role of the small opening, the wider opening, the third, “ground” wire and the GFI on household outlets.
12. Be able to describe how we get 240 V service for washing machines and AC units and why it is better to have than the normal 120 V.

RC Circuits

13. Be able to describe what a capacitor is and what its role is in electric circuits.
14. Be able to list three different ways to increase the capacitance of a capacitor.
15. Be able to calculate the amount of energy stored in a capacitor.
16. Be able to recognize an RC circuit that will charge up its capacitor and an RC circuit that will discharge its capacitor.
17. Be able to explain how to vary R and/or C in order to increase or decrease the amount of time it takes to charge or discharge a capacitor.
18. Be able to determine the time constant for an RC circuit from a plot of V_{cap} versus t and from the values of R and C .