Academic Physics: Electricity Review Sheet

Static Electricity

1. Which combinations of charge (positive, negative, neutral) attract? + −, + N, − N

2. Which combinations of charge repel? + +, − −

3. What does a lightning rod do? Attracts + Redirects Lightning

4. Why are you safe from electricity while inside a hollow metal shell (like a car, house, or plane)?
Electricity flows around the outside of Faraday Cages!

5. Match each method of charging with how the objects are charged afterwards.

	Methods		Charges on Objects Afterwards
4	Friction	2	Both are the same charge
2	Conduction	3	+ and – are temporarily split up
3	Polarization	4	All charge is removed from the object
4	Grounding	1	Objects have opposite charge

Circuit Electricity

$I = V/R$	$V = IR$	$P = IV$	$Energy = P*t$
$\$ = Energy*Rate$		$1kW = 1{,}000\ W$	
$R_t = R_1 + R_2 + R_3$		$1/R_t = 1/R_1 + 1/R_2 + 1/R_3$	

	Name	Definition	Unit
V	Voltage	Electrical Pressure	Volts
I	Current	Amount of Electricity Flowing	Amps
R	Resistance	Fight against Electric Flow	Ohms, Ω
P	Power	Rate of Electricity Use	Watts, Kilowatts
E	Energy	Unit we get billed in	kWhr

6. Alternating or Direct? Devices that plug into wall outlets use AC current, while devices that use throwaway batteries use DC current.

7. How many volts are in the standard electric outlet in the USA? 120 V AC

8. Whether a shock is fatal or not depends primarily on the number of Amps.

9. A computer plugs into a 120V outlet, and draws 2 Amps of current. What is the resistance of this computer?
$V = 120$, $I = 2$, $R = ?$
$V = IR$
$120 = 2 \cdot R$
$R = 60\ \Omega$

10. A toaster has a resistance of 10 ohms and gets plugged into a 120 V outlet.
A) How much current does it draw? $R = 10$, $V = 120$, $I = ?$
$I = \frac{V}{R} = \frac{120}{10} = 12$ Amps

B) How much power does the toaster use (in watts and kilowatts)?
$P = IV$
$(12)(120) = 1{,}440\ W \div 1000 = 1.44\ kW$

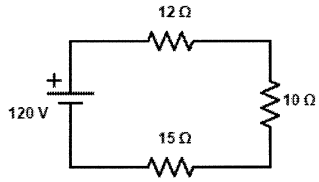
C) If you make toast for 6 hours (hungry!) how much does this cost on your electric bill? (Use a rate of $0.10)
① $E = Pt$
$(1.44)(6) = 8.64\ kwhr$
② $\$ = E \cdot Rate$
$(8.64)(.10) = \$0.864$

Series and Parallel Circuits

11. a. What type of circuit is this? Series

b. How many paths for electricity are there? 1

c. If you unplug a bulb, the others will: Go Out

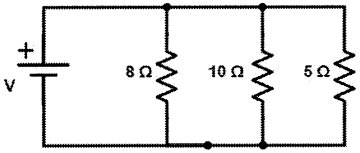


	Voltage (Volts)	* Current (Amps)	Resistance (Ohms)
R1	38.92	3.243	12
R2	32.24	3.243	10
R3	48.64	3.243	15
Total	120	3.243	37

12. a. What type of circuit is this? Parallel

b. How many paths for electricity are there? 3

c. If you unplug a bulb, the others will: Stay On



	* Voltage (Volts)	Current (Amps)	Resistance (Ohms)
R1	10	1.25	8
R2	10	1.00	10
R3	10	2.00	5
Total	10	4.25	2.353