Electric Circuits HW problems from The Physics Classroom 'Calculator Pad'
Forrest – A.P. Physics 1 2019 – NOTE: Some of the problems have been modified from the ones listed online!!
DUE: APRIL 23, 2019

HINT, HINT, HINT --> Redraw the circuits, it will help!

Put these in your problem notebook! Solutions to these are online, and I'll have my own solutions posted online and a hard copy in my room. *3 SIG. FIG'S. IN GENERAL*

From Electricity - - Electric Circuits problem set on the Calculator Pad

PC # 2. The large window air conditioner in Anita Breeze's room draws 11 amps of current. The unit runs for 8.0 hours during the course of a day. Determine the quantity of charge (in coulombs) that passes through Anita's window AC during these 8.0 hours.

PC # 9. A stun gun or **TASER** is designed to put out a few seconds worth of electric pulses that impress a voltage of about 1200 V across the human body. This results in an average current of approximately 3 mA into a human body. Using these figures, estimate the resistance of the human body.

PC # 10. Determine the amount of electrical energy (in J) used by the following devices when operated for the indicated times.
a. Hair dryer (1500 W) - operated for 5 minutes
b. Electric space heater (950 W) - operated for 4 hours
c. X-Box video game player (180 W) - operated for 2 hours
d. 42-inch LCD television (210 W) - operated for 3 hours

PC # 18. An overhead high voltage (4.0×10^5 V) power transmission line delivers electrical energy from a generating station to a substation at a rate of 1500 MW (1.5×10^9 W). Determine the resistance of and the current in the cables.
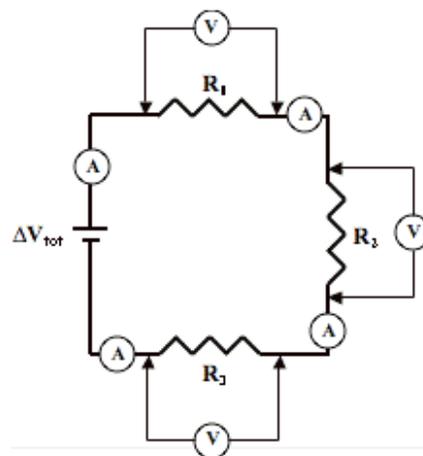
PC # 20. Determine the equivalent resistance of a 6.0 Ω and a 8.0 Ω resistor if …
a. … connected in series.
b. … connected in parallel.

PC # 21. Two resistors with resistance values of 6.0 Ω and 8.0 Ω are connected to a 12.0-volt source. Determine the overall current in the circuit if the resistors are …
a. … connected in series.
b. … connected in parallel.

PC # 25. Voltmeters can be used to determine the voltage across two points on a circuit. An ammeter can be used to determine the current at any given location on a circuit. The circuit at the right is powered by a 60.0-volt power source and utilizes three voltmeters and three ammeters to measure voltage drops and currents. The resistor values are 10.3 Ω (R_1), 15.2 Ω (R_2) and 12.8 Ω (R_3). Determine the ammeter readings and voltmeter readings.


PC # 29. Determine the equivalent resistance of a parallel arrangement of two resistors with resistance values of …

a. … 8.0 Ω and 8.0 Ω
b. … 5.0 Ω and 5.0 Ω
c. … 5.0 Ω and 8.0 Ω

d. … 5.0 Ω and 9.2 Ω
e. … 5.0 Ω and 27.1 Ω
f. … 5.0 Ω and 450 Ω

PC # 30. The parallel circuit at the right depicts two resistors connected to a voltage source. The voltage source (ΔV_{tot}) is a 12-V source and the resistor values are 6.4 Ω (R_1) and 3.9 Ω (R_2).
a.   Determine   the   equivalent   resistance   of   the   circuit.
b.   Determine   the   current   in   each   branch   resistor.
c. Determine the total current in the circuit.
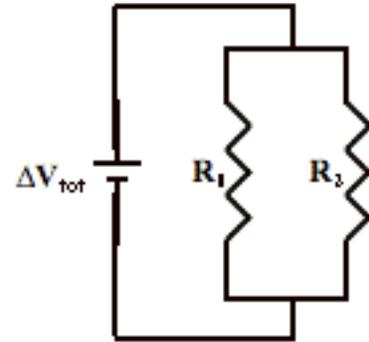
PC # 32. Voltmeters can be used to determine the voltage across two points on a circuit. An ammeter can be used to determine the current at any given location on a circuit. The circuit below is powered by a 24.0-volt power source and utilizes four voltmeters and three ammeters to measure voltage drops and currents. The resistor values are 54.5 Ω (R_1), 31.7 Ω (R_2) and 48.2 Ω (R_3). Determine the ammeter readings and voltmeter readings for the positions shown on the diagram.