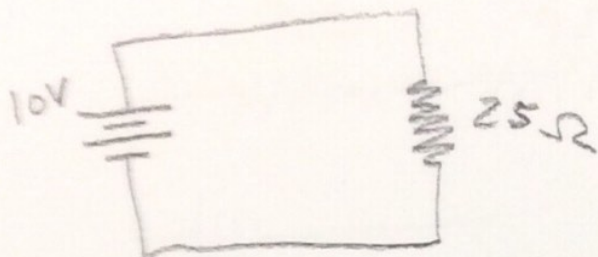


Whiteboarding AP Circuits

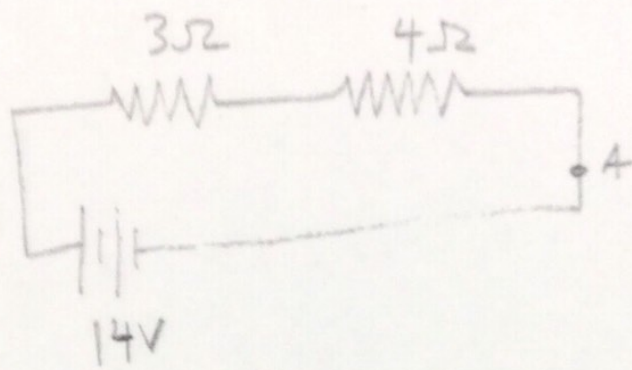
1.



If the above battery of 10V were replaced by a battery of 15V, by how much would power output of the resistor increase?

2. A circuit includes three resistors each with $8\ \Omega$ in parallel. One of the resistors breaks and no longer allows current to flow. What is the ratio of final current after the resistor breaks compared to the original current through the battery?

3. A string of holiday lights has 5 bulbs with equal resistances. If one bulb burns out, the other bulbs still glow. When all 5 bulbs are working and the lights are connected to a 60V battery, the current through the battery is 10 Amps. What is the resistance of each bulb?



4. How many electrons flow through point A in 1 minute?

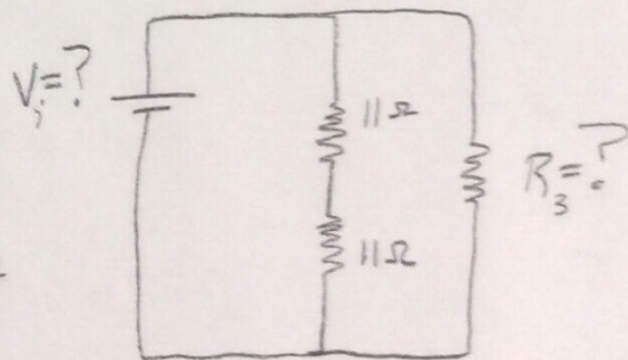
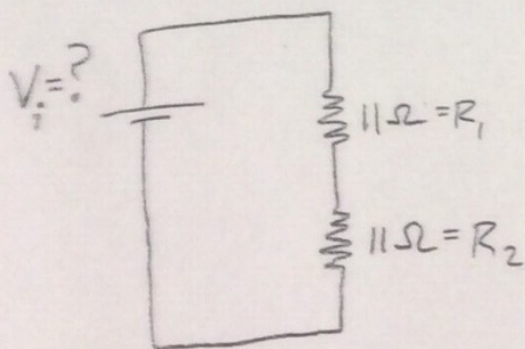
hints: start with $I = \frac{V}{R}$

$$I = \frac{q}{t} = \frac{\text{Coulombs}}{\text{second}} : \text{amps}$$

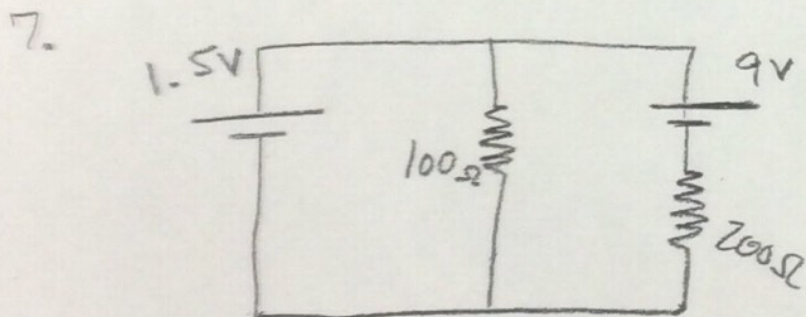
$$-1 \text{ C} = 6.25 \times 10^{18} \text{ electrons}$$

$$+1 \text{ C} = 6.25 \times 10^{18} \text{ protons}$$

5. A circuit consist of a battery and two 11Ω resistors in series. The current through the battery is $.6 \text{ A}$. A third resistor is then added to the circuit in parallel and the current through the new branch is $.4 \text{ A}$. What is the resistance of the new resistor?



6. Two appliances, a TV and a toaster, are connected to a 120 V power source in parallel. There also exists a $3\ \Omega$ resistor in series. The TV has resistance $10\ \Omega$ and the toaster $30\ \Omega$. Both the TV and toaster are turned on. How much current is passing through the $3\ \Omega$ resistor? Start by drawing a circuit diagram.



1. Start by labeling junctions.
2. Label your currents.
3. Label your loops.

4. Find the current flowing through each component.
5. Find the voltage drop across the $100\ \Omega$ resistor.
6. Find the voltage drop across the $200\ \Omega$ resistor.
7. Find the power dissipated by the $100\ \Omega$ resistor.
8. Find the power dissipated by the $200\ \Omega$ resistor.