

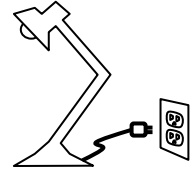
# Electricity Homework 2

Name: \_\_\_\_\_

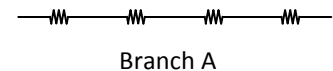
Hour: \_\_\_\_\_ Date: \_\_\_\_\_

The voltage (potential difference) between the two prongs in an outlet in your home is 120 V. The lamp at the right contains a 60 Watt bulb.

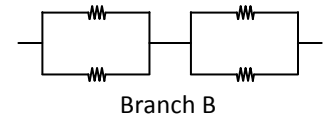
1. Find the current running through the bulb if plugged in and lit.
2. Find the resistance of the bulb.
3. How much energy would the bulb use in 2 minutes?
4. What would happen to the brightness if you put a 100 W bulb in the lamp?
5. Calculate the current running through the 100 W bulb.
6. Calculate the resistance of the 100 W bulb.



7. If each resistor has resistance  $R$  calculate the total resistance of each branch of the hypothetical circuit shown at the right.

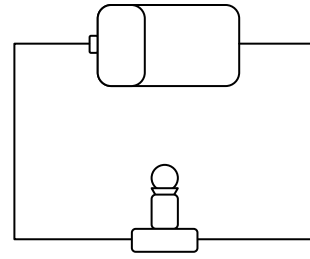


8. If each were connected to the same battery with potential difference  $V$  how would the current through each branch compare?



9. Describe how fuses (or circuit breakers in your home) work and why they are needed? Be sure to include in what units they are rated and why.
10. How (in series, in parallel or in combination) are the appliances in your house wired? Justify your answer.
11. How (in series, in parallel or in combination) are street lights wired? Justify your answer.
12. How (in series, in parallel or in combination) are old, cheap Christmas lights wired? Justify your answer.
13. What does a “storage battery” in your car store?

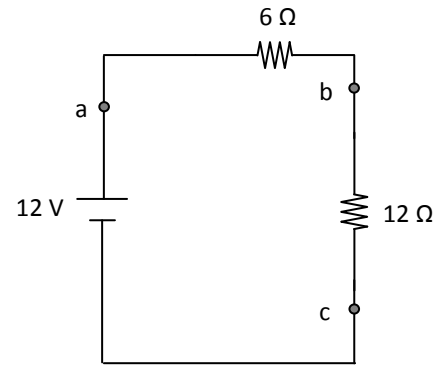
A bulb is connected to a battery as shown and has brightness B.



14. Draw a diagram where there are now two bulbs connected to the battery in parallel with each other.
15. How does the brightness of your two bulbs compare to the original bulb?
16. If one of your bulbs is unscrewed what will happen to the other bulb? Justify your answer.
17. If you hook up another bulb in parallel what will happen to the two other two bulbs? Justify your answer.
18. What happens to the energy output of the battery as more bulbs are hooked up in parallel?
19. Draw a diagram where there are now two bulbs connected to the battery in series with each other.
20. How does the brightness of your two bulbs compare to the original bulb?
21. If one of your bulbs is unscrewed what will happen to the other bulb? Justify your answer.
22. If you hook up another bulb in series what will happen to the two other two bulbs? Justify your answer.
23. What happens to the energy output of the battery as more bulbs are hooked up in series?

Use the diagram at the right to answer the following questions.

24. What is the total resistance provided by the resistors?
25. What is the current through the point b?
26. What is the voltage across the  $6\Omega$  resistor (measured from b to c)?
27. Which of the following describes the currents at points a, b and c?  
 $a > b > c$      $c > b > a$      $a = c < b$      $a = b = c$



Use the diagram at the right to answer the following questions.

28. What is the total resistance provided by the resistors?
29. What is the current through the point a?
30. What is the voltage across the  $6\Omega$  resistor (measured from point b to point c)?
31. Which of the following is true of the currents at points a, b and d?  
 $a = b + d$      $a = b - d$      $b = a + d$      $a = b = d$

