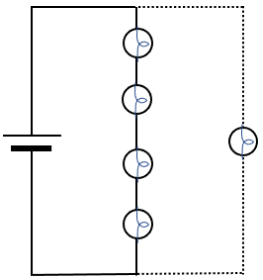
Homework: Circuits

Name _____

Complete the following questions and submit as this week's homework assignment.

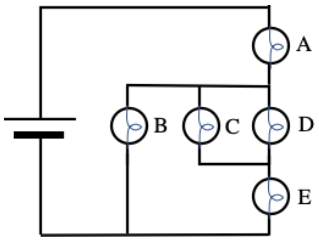
1. Consider four identical bulbs connected in series to an ideal battery. A fifth identical bulb is then connected in parallel with the first four, as shown in the figure at right.



   a. When the fifth bulb is connected, will the brightness of the four bulbs increase, decrease, or remain the same? Explain your reasoning.

   b. When the fifth bulb is connected, will the current out of the battery increase, decrease, or remain the same? Explain your reasoning.

2. In the circuit at right, the bulbs are identical, and the battery is ideal. Rank the brightness of the bulbs in the circuit at right. Explain your reasoning for your ranking.



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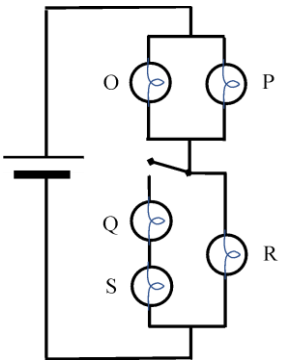
3. In the circuit at right, the switch is initially open, and the ranking of the brightness of the bulbs is: $R > O = P$. Bulbs Q and S do not light. When the switch is closed, several changes are observed. For each observation below, give an explanation.



   a. Bulb *R* is dimmer than it was when the switch was open.

   b. Bulbs *Q* and *S* light up and are equally bright.

   c. Bulbs *O* and *P* are brighter than they were when the switch was open.

   d. Bulbs *O* and *P* are brighter than *Q* and S.