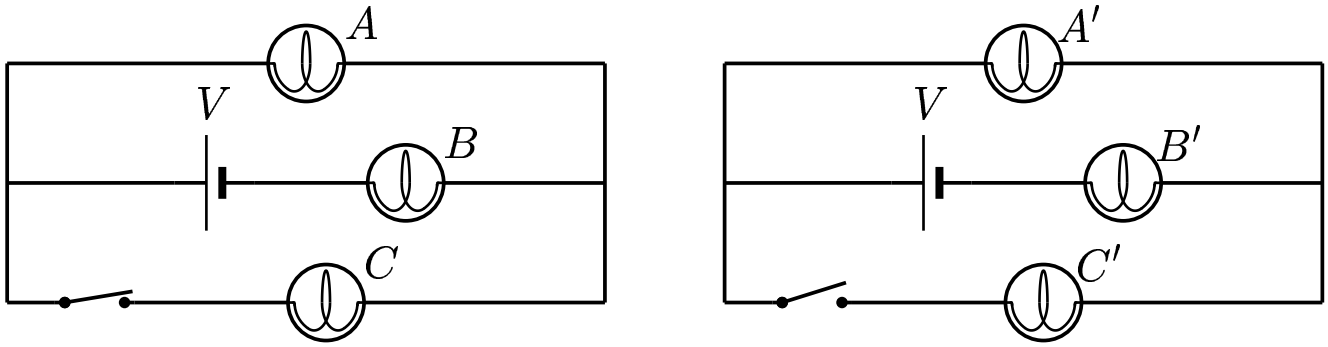
Three identical bulbs are connected in two ways as shown. Denote the brightness without a prime when the switch is closed and with a prime $'$ when the switch is open.



Compare the respective brightnesses of bulbs A and B when the switch is closed to when the switch is open.

A) $B' > B$ and $A' > A$

B) $B' < B$ and $A' > A$

C) $B' > B$ and $A' < A$

C) $B' < B$ and $A' < A$

$$\frac{I'_B}{I_B} = \frac{\dfrac{V}{2\,R}}{\dfrac{V}{\dfrac{3\,R}{2}}} = \frac{3}{4}$$

$$\frac{I'_A}{I_A} = \frac{\dfrac{V}{2\,R}}{\dfrac{1}{2}\,\dfrac{V}{\dfrac{3\,R}{2}}} = \frac{3}{2}$$

Since the brightness is directly proportional to the power $P = I^2\,R$, $B' < B$ and $A' > A$.

Answer **B**.

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