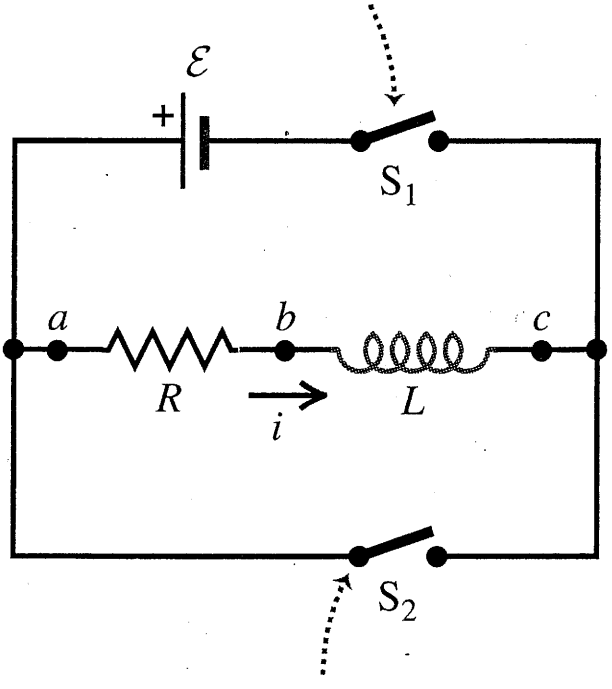
30.24. Write an equation corresponding to Eq. (30.13) for the current shown in Fig. 30.11 just after switch S_2 is closed and switch S_1 is opened, if the initial current is I_0. Use integration methods to verify Eq. (30.18).

$$\frac{di}{dt} = \frac{\mathcal{E} - iR}{L} = \frac{\mathcal{E}}{L} - \frac{R}{L}i \qquad (30.13)$$

$$i = I_0 e^{-(R/L)t} \qquad (30.18)$$

30.11 An *R*-*L* circuit.

Closing switch S_1 connects the *R*-*L* combination in series with a source of emf $\mathcal{E}$.



Closing switch S_2 while opening switch S_1 disconnnects the combination from the source.