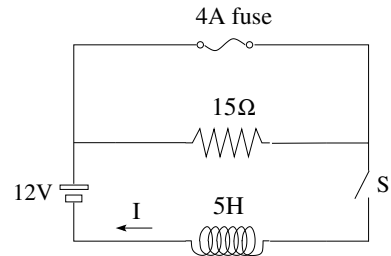


[lex79] RL circuit I

In the circuit shown the switch S is closed at $t = 0$. This move connects a source of constant voltage $\mathcal{E} = 12\text{V}$ to a circuit with three branches. The resulting current in the top branch will reach the value $I_F = 4\text{A}$ at time t_F , which breaks the fuse.

- Find the currents $I(t)$ through the inductor for $0 < t < t_F$ and the value of t_F .
- Find the current $I(t)$ through the inductor for $t > t_F$.
- Sketch the current $I(t)$ for $0 < t < 3t_F$ and determine its value in the limit $t \rightarrow \infty$.



Solution: