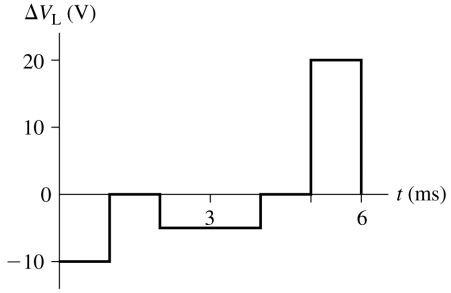
33.61. **Model:** Assume we can ignore the sharp corners when the current changes abruptly.
Visualize: The changing current produces a changing flux, an induced emf, and a corresponding potential difference.
Solve: Break the current into time intervals over which the current is changing linearly or not at all. For the intervals 1 ms to 2 ms and 4 ms to 5 ms, the current does not change, so the potential difference is zero. For the interval 0 s to 1 ms, the current goes from 0 A to 1 A, so the potential difference is

$$\Delta V_{\mathrm{L}} = -L\frac{dI}{dt} = -L\frac{\Delta I}{\Delta t} \Rightarrow \Delta V_{\mathrm{L}} = -\left(10\times10^{-3}\ \mathrm{H}\right)\frac{1\ \mathrm{A}-0\ \mathrm{A}}{(1\ \mathrm{s}-0\ \mathrm{s})\times10^{-3}} = -10\ \mathrm{V}$$

Similarly for the interval 2 ms to 4 ms, the potential difference is −5 V. For the interval 5 ms to 6 ms, the potential difference is +20 V.



Assess: The potential difference is proportional to the negative slope of the current versus time graph.