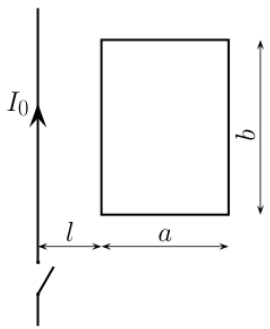
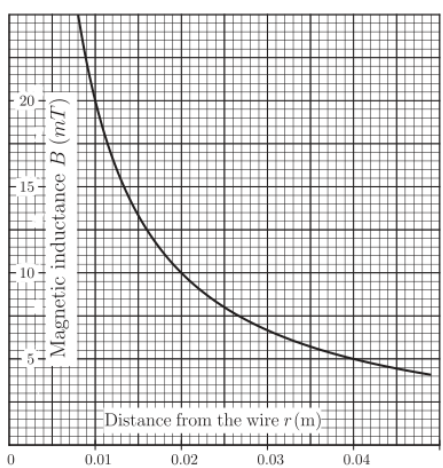
**8. Loop of wire (7 pts)**

Consider a rectangular loop of wire with dimensions $a = 0.03\,\mathrm{m}$ and $b = 1.0\,\mathrm{m}$, one side of which is parallel to another long straight wire carrying current $I_0 = 1000\,\mathrm{A}$, at distance $l = 0{,}01\,\mathrm{m}$, see figure. The magnetic inductance of such current is plotted as a function of the distance from the wire in attached graph. The Ohmic resistance of the loop is $R = 1{,}0\,\Omega$, the inductance is negligible.




**1)** Calculate the magnetic flux $\Phi$ through the loop (2 pts).

**2)** At a certain moment of time, the current in the long wire is switched off. What is the net charge $Q$ flowing through a fixed cross-section of the wire of the loop (3 pts)?

**3)** What is the net momentum $p$ given to the loop during the switch-off of the current (express it in terms of $Q$ and the given quantities, if you were unable to calculate $Q$) (2 pts)?