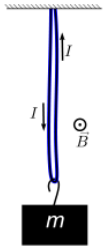
**Problem 7. Lifting by current** ***(7 points)***

Consider a loop of freely deformable conducting wire with insulation of length $2l$, the two ends of which are fixed (permanently) to the ceiling. A load of mass $m$ is fixed to the middle of the wire (the mass of the wire is negligible). There is also a horizontal magnetic field of induction $B$; free fall acceleration is $g$. A current $I$ is lead through the wire. Neglect the field induced by the wires.




**i. (2 pts)** Sketch the shape of the wire.

**ii. (2 pts)** What is the maximal height by which the load can be lifted in such a way (increasing the current, if necessary)?

**iii. (2 pts)** Write an equation from which it is possible to determine the lifting height $\Delta h$.

**iv. (1 pt)** How large current $I_0$ is needed to lift the load by $\Delta h_0 = l\left(1 - \frac{3}{\pi}\right)$?