

**32.71. Model:** A magnetic field exerts a magnetic force on a length of current carrying wire. We ignore gravitational effects, and focus on the  $B$  effects.

**Visualize:** Please refer to Figure P32.71. The figure shows a wire in a magnetic field that is directed out of the page. The magnetic force on the wire is therefore to the right and will stretch the springs.

**Solve:** In static equilibrium, the sum of the forces on the wire is zero:

$$F_B + F_{\text{sp}1} + F_{\text{sp}2} = 0 \text{ N} \Rightarrow ILB + (-k\Delta x) + (-k\Delta x) \Rightarrow I = \frac{2k\Delta x}{LB} = \frac{2(10 \text{ N/m})(0.01 \text{ m})}{(0.20 \text{ m})(0.5 \text{ T})} = 2.0 \text{ A}$$