63. The initial and final kinetic energies are zero, and we set up energy conservation in the form of Eq. 8-31 (with $W = 0$) according to our assumptions. Certainly, it can only come to a permanent stop somewhere in the flat part, but the question is whether this occurs during its first pass through (going rightward) or its second pass through (going leftward) or its third pass through (going rightward again), and so on. If it occurs during its first pass through, then the thermal energy generated is $\Delta E_{\rm th} = f_k d$ where $d \leq L$ and $f_k = \mu_k mg$. If it occurs during its second pass through, then the total thermal energy is $\Delta E_{\rm th} = \mu_k mg(L + d)$ where we again use the symbol d for how far through the level area it goes during that last pass (so $0 \leq d \leq L$). Generalizing to the $n^{\rm th}$ pass through, we see that $\Delta E_{\rm th} = \mu_k mg((n-1)L + d)$. In this way, Eq. 8-39 leads to

$$mgh = \mu_k mg\left((n-1)L + d\right)$$

which simplifies (when h = L/2 is inserted) to

$$\frac{d}{L} = 1 + \frac{1}{2\mu_k} - n\ .$$

The first two terms give $1 + 1/2\mu_k = 3.5$, so that the requirement $0 \leq d/L \leq 1$ demands that $n = 3$. We arrive at the conclusion that $d/L = \frac{1}{2}$ and that this occurs on its third pass through the flat region.