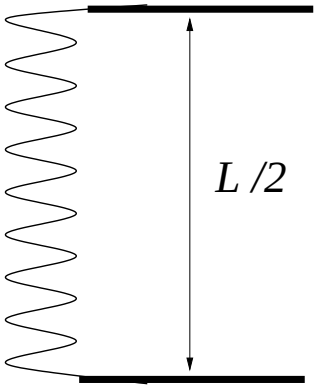
Sliding down serpentine

A bead slides down along vertical frictionless wire of length L. The wire is bent into serpentine with the overall height $L/2$. How much greater is the slide time compared to the time it would take the bead to fall from height L? The linear size of the curved parts is much smaller than the length of the wire, and the bead is much smaller than the bend radius.



Answer of problem **Sliding down serpentine**

Sliding time is that of a bead sliding down inclined plane with $\sin\alpha = (L/2)/L = 1/2$:

$$t_{slide} = 2\sqrt{\frac{L}{g}}$$

Free Falling time is

$$t_{fall} = \sqrt{\frac{2L}{g}}$$

$\sqrt{2}$ times shorter