

Mechanics – Problem I (8 points)

Jumping particle

A particle moves along the positive axis Ox (one-dimensional situation) under a force that's projection on Ox is $F_x = F_0$ as represented in the figure below (as function of x). At the origin of Ox axis is placed a perfectly reflecting wall.

A friction force of constant modulus $F_f = 1,00\text{ N}$ acts anywhere the particle is situated.

The particle starts from the point $x = x_0 = 1,00\text{ m}$ having the kinetic energy $E_c = 10,0\text{ J}$.

- Find the length of the path of the particle before it comes to a final stop
- Sketch the potential energy $U(x)$ of the particle in the force field F_x .
- Draw qualitatively the dependence of the particle speed as function of his coordinate x .

