

## 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  $x$ .

