\[ D = \frac{\sigma^2}{2 \cdot \Delta t} \]

where \( \sigma \) is the dispersion of the displacement during the interval of time \( \Delta t \).

Take \( \Delta t = m \cdot t_* \),

where \( m \) is some integer \( \geq 1 \). Note that we can apply Central Limiting Theorem only at \( m \gg 1 \).

The displacement during \( \Delta t = m \cdot t_* \) consists of \( m \) elementary displacements, which are independent random numbers. Hence

\[ \sigma^2 = m \cdot \sigma_0^2, \]

where \( \sigma_0 \) is the dispersion of elementary displacement.

\[ \sigma_0^2 = (e-0)^2 \cdot \frac{1}{2} + (-e-0)^2 \cdot \frac{1}{2} = e^2. \]

Hence

\[ D = \frac{\sigma_0^2}{2 m \cdot t_*} = \frac{e^2}{2 t_*} \]