$\Psi(x)$ $n=4$ $|\Psi(x)|^2$

$n=3$

$n=2$ $n=3$

$n=1$ $n=2$

$n=1$

§42. Свободная частица.

$$\vec{v} = const$$

Полная энергия равна кинетической.

$$\frac{d^2\Psi}{dx^2} + \frac{2m}{\hbar^2}E\Psi = 0$$

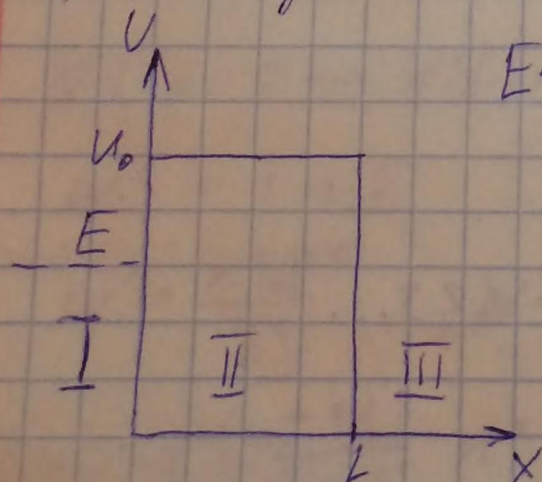$$\Psi = Ae^{\frac{i}{\hbar}\sqrt{2mE}\,x} + Be^{-\frac{i}{\hbar}\sqrt{2mE}\cdot x}$$

$$\Psi(x,t) = Ae^{-i\left(\frac{Et}{\hbar} - \frac{\sqrt{2mE}}{\hbar}x\right)} + Be^{-i\left(\frac{Et}{\hbar} + \frac{\sqrt{2mE}}{\hbar}x\right)}$$

$$w = \frac{E}{\hbar}, \quad k = \frac{\sqrt{2mE}}{\hbar}$$

$$|\Psi|^2 = \Psi \cdot \Psi^* = A^2$$

§43. Туннельный эффект.

$$E < U_0 \quad \frac{d^2\Psi}{dx^2} + \frac{2m}{\hbar^2}E\Psi = 0 \quad (\text{I}, \text{III}).$$

$$\frac{d^2\Psi}{dx^2} + \frac{2m}{\hbar^2}(E - U_0)\Psi = 0 \quad (\text{II})$$

$$E - U_0 < 0$$