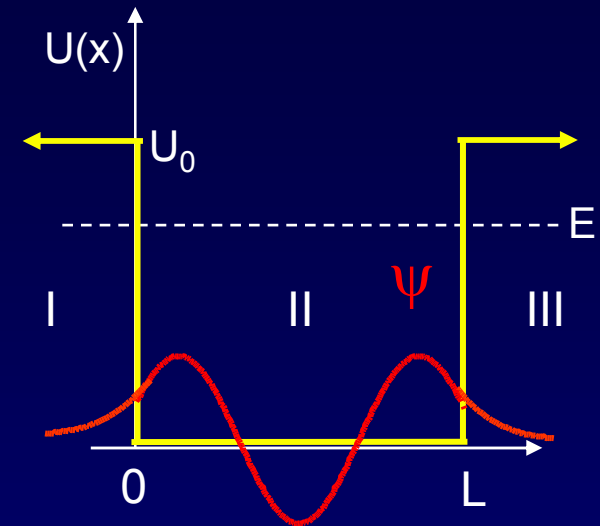# Particle in a Finite Well (5)

The boundary conditions are not the same as for the finite well. We no longer require that $\psi = 0$ at $x = 0$ and $x = L$.

Instead, we require that $\psi(x)$ and $d\psi/dx$ be continuous across the boundaries:

ψ is continuous $d\psi/dx$ is continuous

At x = 0: $\psi_I = \psi_{II}$ $\dfrac{d\psi_I}{dx} = \dfrac{d\psi_{II}}{dx}$

At x = L: $\psi_{II} = \psi_{III}$ $\dfrac{d\psi_{II}}{dx} = \dfrac{d\psi_{III}}{dx}$

Unfortunately, this gives us a set of four transcendental equations.
They can only be solved numerically (on a computer).
We will discuss the qualitative features of the solutions.