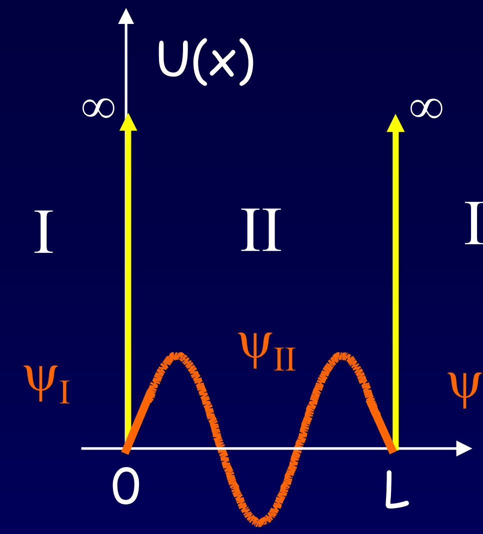
Particle in a Box (3)



Now, let's worry about the boundary conditions.

Match ψ at the left boundary (x = 0).

Region I: $\psi_I(x) = 0$

Region II: $\psi_{II}(x) = B_1 \sin kx + B_2 \cos kx$

Recall: The wave function ψ(x) must be continuous at all boundaries.

Therefore, at x = 0:

$$\psi_I(0) = \psi_{II}(0)$$

$$\Rightarrow \quad 0 = B_1 \sin(0) + B_2 \cos(0)$$

$$\boxed{0 = B_2}$$ because cos(0) = 1 and sin(0) = 0

This "boundary condition" requires that there be no cos(kx) term!