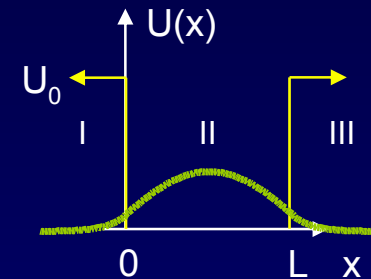


Tunneling

In quantum mechanics a particle can penetrate into a barrier where it would be classically forbidden.

The finite square well:

In region III, $E < U_0$, and $\psi(x)$ has the exponential form $D_1 e^{-Kx}$. We did not solve the equations – too hard!
You will do this using the computer in Lab #3.



The probability of finding the particle in the barrier region decreases as e^{-2Kx} .

The finite-width barrier:

Today we consider a related problem – a particle approaching a finite-width barrier and “tunneling” through to the other side.

The result is very similar, and again the problem is too hard to solve exactly here:

The probability of the particle tunneling through a finite width barrier is approximately proportional to e^{-2KL} where L is the width of the barrier.