Numerical Solutions for Schrodinger's Equation for the Particle in the Finite Potential Well

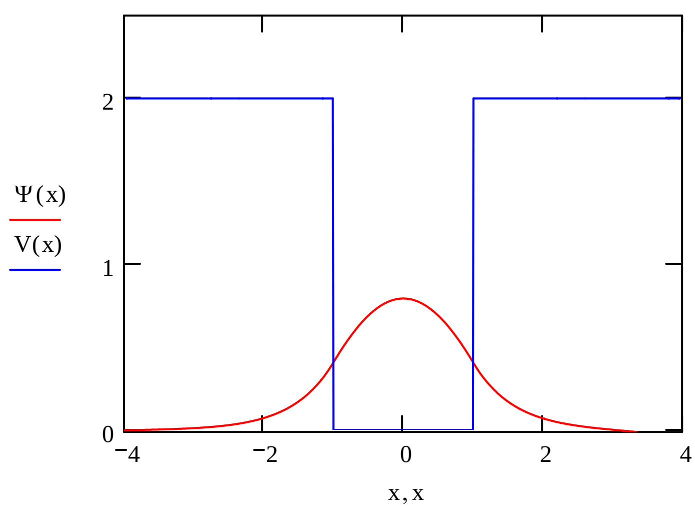
Parameters go here: $m := 1$ $V_0 := 2$ $lb := -1$ $rb := 1$ $x_{min} := lb - 3$ $x_{max} := rb + 3$

Potential energy $V(x) := \text{if}\left[(x \ge lb)\cdot(x \le rb), 0, V_0\right]$

Given $\frac{-1}{2\cdot m}\cdot\frac{d^2}{dx^2}\Psi(x) + V(x)\cdot\Psi(x) = E\cdot\Psi(x)$ $\Psi(x_{min}) = 0$ $\Psi'(0) = 0.1$

$\Psi := \text{Odesolve}(x, x_{max})$ Normalize wavefunction: $\Psi(x) := \frac{\Psi(x)}{\sqrt{\int_{x_{min}}^{x_{max}} \Psi(x)^2\,dx}}$

Enter energy guess: $E \equiv 0.5289$



Calculate the probability the particle is in the barrier: $2\cdot\int_{rb}^{x_{max}} \Psi(x)^2\,dx = 0.099$