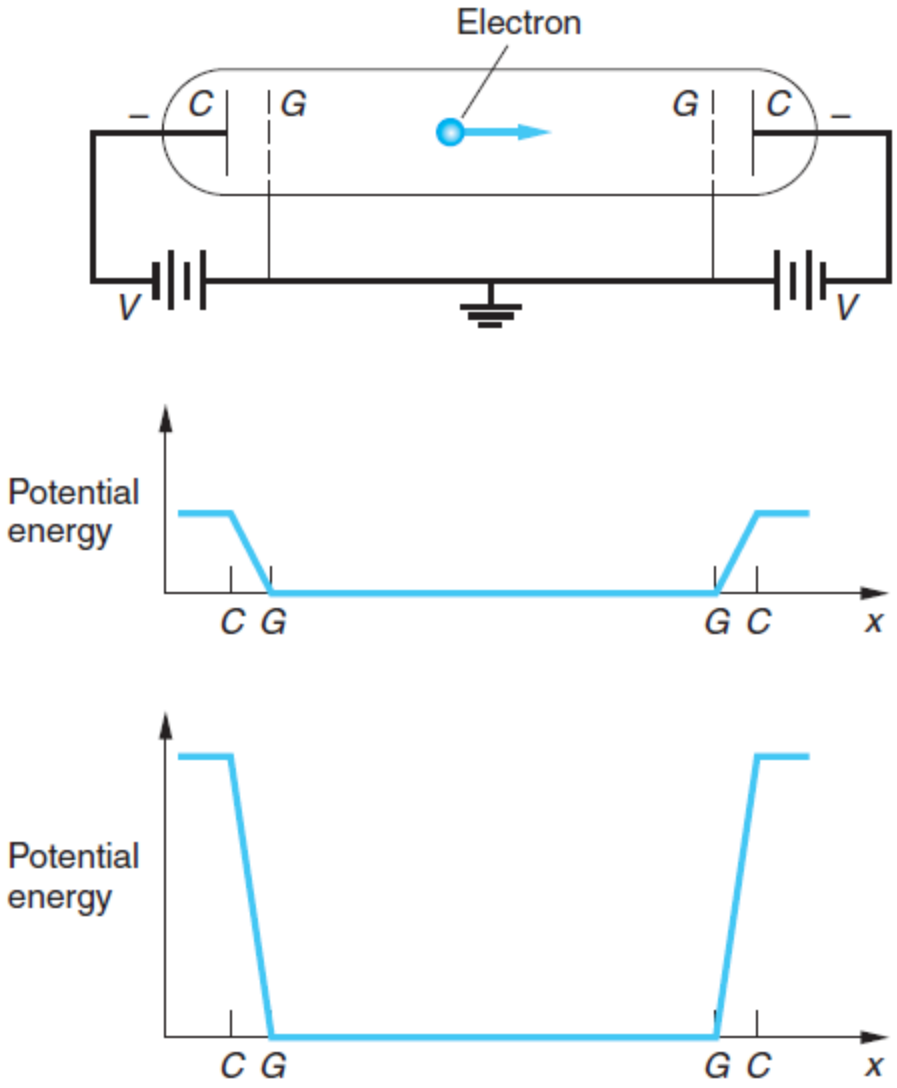
Infinite Square Well Potential



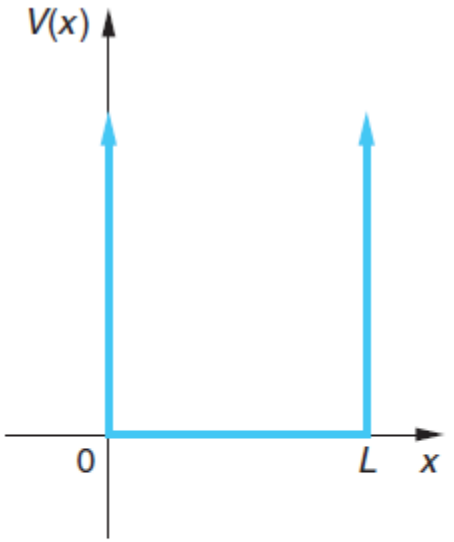


Figure 6-2 Infinite square well potential energy. For $0 < x < L$, the potential energy $V(x)$ is zero. Outside this region, $V(x)$ is infinite. The particle is confined to the region in the well $0 < x < L$.

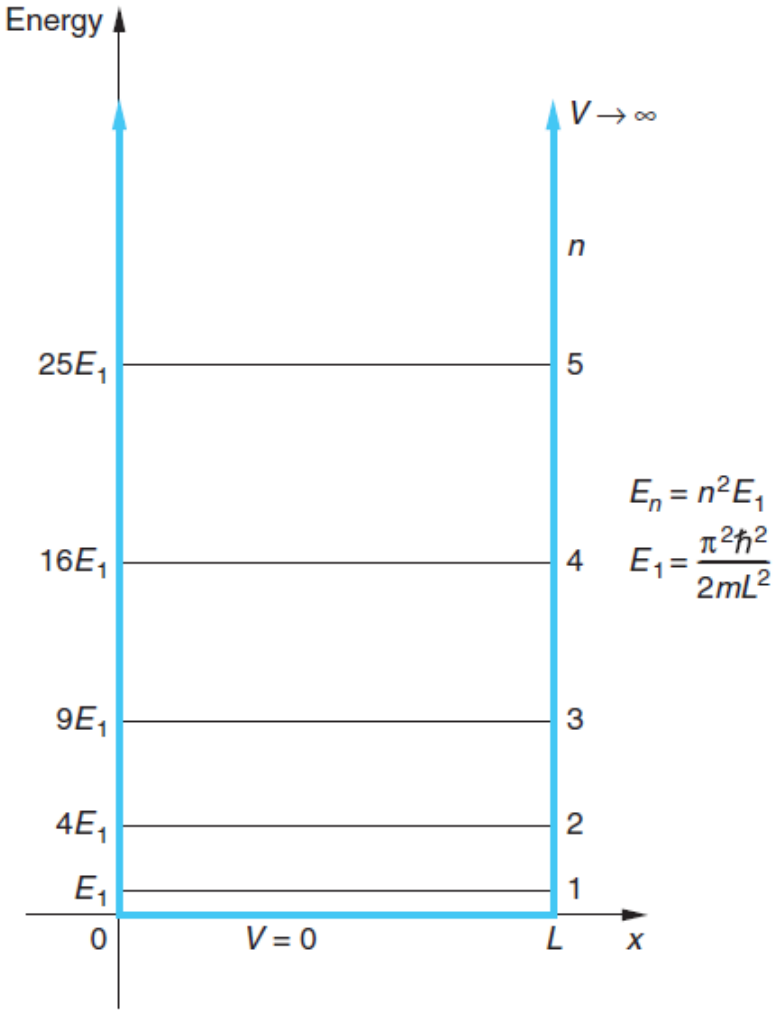
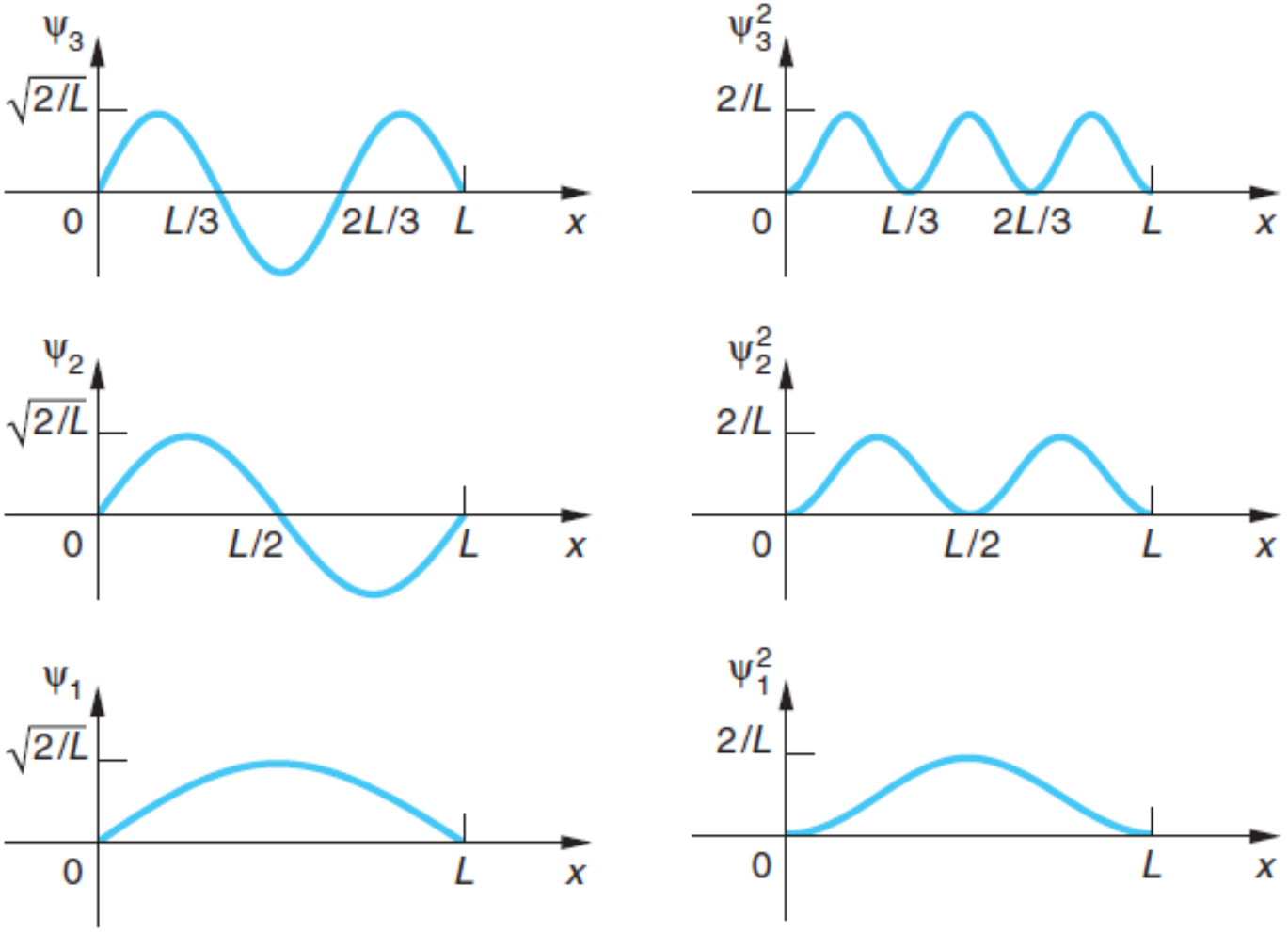


Figure 6-3 Graph of energy vs. x for a particle in an infinitely deep well. The potential energy $V(x)$ is shown with the colored lines. The set of allowed values for the particle's total energy E_n as given by Equation 6-24 form the energy-level diagram for the infinite square well potential. Classically, a particle can have any value of energy. Quantum mechanically, only the values given by $E_n = n^2(\hbar^2\pi^2/2mL^2)$ yield well-behaved solutions of the Schrödinger equation. As we become more familiar with energy-level diagrams, the x axis will be omitted.


ψ_3
$\sqrt{2/L}$
0
L/3
2L/3
L
x
ψ_3^2
2/L
0
L/3
2L/3
L
x
ψ_2
$\sqrt{2/L}$
0
L/2
L
x
ψ_2^2
2/L
0
L/2
L
x
ψ_1
$\sqrt{2/L}$
0
L
x
ψ_1^2
2/L
0
L
x

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