1.   A.   Sketch V(x) for an infinite one-dimensional box,

$V(x)$

$\overline{\hspace{1em}}$ $10E_1$

$5E_1$

E_1

0

−L/2   0   L/2 x
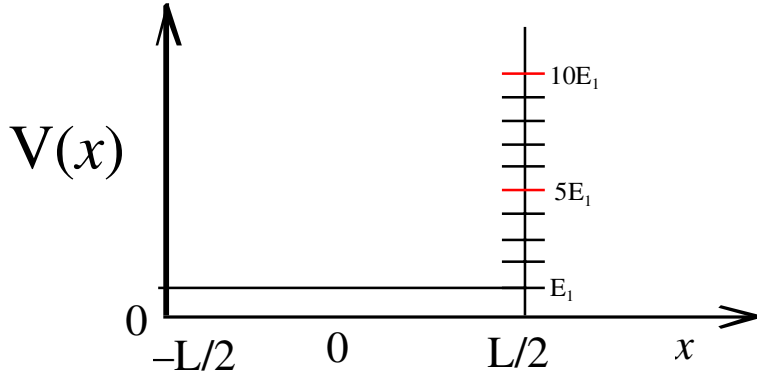
$V(x) = \quad |x| > L/2$
$V(x) = \quad |x| < L/2$

Draw in the energies of the n = 2 and n = 3 levels and specify the number of internal nodes in ψ_3.

B.   Sketch the wavefunction for the state that has one internal node.

C.   What is $\psi_n(0)$ for all odd n?

D.   What is $\psi_n(0)$ for all even n?

E.   The momentum, p, for the particle inside the box

$$p_n = \pm[2mE_n]^{1/2}.$$

Sketch the probability distribution P(p) for the momentum of a particle in an infinite one-dimensional box.

0.5

P(p) 0

0   **p**
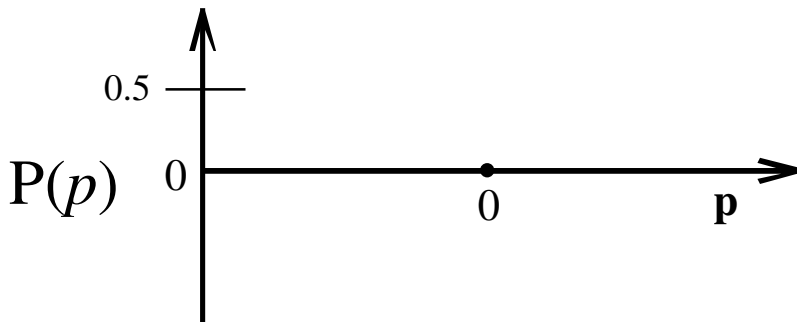
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Fall 2018