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Memo No. _____

Date / /

Occupation Number Representation

3.1 A Particle in a Box

$$\hbar=1, \quad \hat{p} = -i \frac{\partial}{\partial x}, \quad \psi(x) = \frac{1}{\sqrt{L}} e^{ipx}$$

$$e^{ipx} = e^{ip(x+L)} \Rightarrow e^{ipL} = 1$$

$$\Rightarrow pL = 2\pi m \Rightarrow p_m = \frac{2\pi m}{L}, \quad m \in \mathbb{Z}$$

$$E = \sum_m n_{pm} E_{pm}, \quad n_{pm} \text{ is num of part. in state } p_m.$$