



Memo No. _____
Date / /

Occupation Number Representation

3.1 A Particle in a Box

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

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

$$\Rightarrow PL=2\pi m \Rightarrow P_m = \frac{2\pi m}{L}, m \in \mathbb{Z}.$$

$$E_f = \sum_m n_{pm} E_{pm}, n_{pm} \text{ is num of part. in state } P_m.$$