習題五

1. 課本 Ch. 3 3.4

提示：



解答：



1. 課本 Ch. 3 3.5

解答：



 以上解答的a，答案數值上忘了乘上。

1. Consider the wave packet-like state as described in Example 2-1 of P27, for which the wave function in momentum space is:

It wavefunction in position space is equal to

1. The constant can be determined by the condition . Calculate . (10)
2. Calculate the expectation values: . (10)

Hint: Use wave function in momentum space。

解答：

1. ，。
2. 期望值：
3. Consider an infinite potential as discussed in class, with boundaries at and : and .



A particle is known to be localized in middle of the box, with the instant wavefunction as:

Calculate the probabilities that at the instance the energy measurement yields the ground state energy , the energy of the first excited state and the second excited state .

解答：這樣就滿足邊界條件。我們就能預期可以以展開：。