

Quantum Mechanics II: PHYS 314 (Spring 2021)

Quick quiz 9

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Instructions

These quick quizzes are low-stakes assessment tools to help cement your understanding of our material. They will help you remember the key facts and can serve as a study guide to help you focus on material you are less familiar with. These quizzes do not contribute to your grade and are for your own use.

1. **Without looking at your notes or the textbook, and without consulting with your neighbour**, write your answer to each question in the **first column**.
2. Discuss with your neighbour and use your notes or the textbook as needed to answer each question and write your answers to each question in the **second column**. You should complete the second column, but do not add anything to your first column.

There are four questions.

Question 1

State the variational principle.

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Question 2

What makes a good variational Ansatz?

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Question 3

What wavefunction would you use in the variational method for the *anharmonic oscillator* potential, $V(x) = m\omega^2 x^2/2 + \lambda x^4$?

**Question 4**

In what situations would you expect your variational Ansatz to provide a good bound on the ground state energy of the anharmonic oscillator in Question 3?

