

**Quantum Mechanics II: PHYS 314 (Spring 2021)**  
**Quick quiz 4**

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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**

Describe the relationship between spin and statistics.

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**Question 2**

Suppose two bosons are in a spin singlet state. What must properties must their spatial wavefunctions have?

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**Question 3**

How would  $n$  electrons arrange themselves in a simple harmonic oscillator potential? How about  $n$  bosons?

**Question 4**

How do you think the relationship between spin and symmetries can explain the properties of materials?

