

Quantum Field Theory I: PHYS 721 (Fall 2021)
Quick quiz 3

Chris Monahan
William & Mary

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

Write down the Clifford algebra. 1. What has this got to do with spinor representations of the Lorentz group? 2. What has this got to do with the Dirac equation?

|

Question 2

How many states are there in the representation of the Poincaré group that has $j > 0$?
How does this depend on m ?

|

Question 3

We introduced spinor representations by assigning $J_i^- = \sigma_i$ and $J_i^+ = 0$ for one representation and $J_i^- = 0$ and $J_i^+ = \sigma_i$ for the other. Why did we do this? What is going on here?

|

Question 4

What do you find most confusing about the course so far?

|