

Quantum Field Theory I: PHYS 721 (Autumn 2020)
Quick quiz—Thursday, October 15.

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 physically-distanced neighbour**, write your answer to each question in the **first column**.
2. After our review and class discussion, 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 Wick's theorem for scalar fields and for fermion fields.

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Question 2

What is the momentum space representation of the Dirac propagator?

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Question 3

Why do we care about time-ordering operators?

**Question 4**

Draw the leading fully-connected diagrams for $\psi\psi \rightarrow \psi\psi$ scattering in Yukawa theory (in which fermion fields ψ are coupled to scalar fields ϕ) and for $\bar{\psi}\psi \rightarrow \bar{\psi}\psi$ scattering.

