PHYS 7325 Homework 2

Professor Halverson

Due: November 1

1. Canonical Quantization. We're temporarily out of the path integral and into canonical quantization, which feels more like normal quantum mechanics. Enjoy thinking about operators again!

a) 1 point. I.8.1.

b) 1 point. I.8.2.

c) 3 points. I.8.3. What is this object? What if it were $\langle 0|T[\phi^\dagger(x)\phi(0)]|0\rangle$ instead?

d) 1 point. I.8.4.

2. Symmetries. They govern interactions and give us conservation laws.

a) 1 point. I.10.2.

b) 1 point. I.10.3.

c) 3 points. Verify the operator equation for Q at the top of page 66 in Zee.

3. Spinors. Because there's more to life than scalars.

a) 1 point. II.1.6.

b) 2 points. II.1.7.

c) 1 point. II.2.1.

d) 2 points. II.5.1.

e) 2 point. II.5.2.