

P621—Quantum Field Theory
Fall, 2010
Problem Set 1
Due: Tuesday, September 21

1.) Problem 1.1 from Srednicki

2.) A Lorentz transformation obeys the condition

$$g_{\mu\nu}\Lambda^\mu{}_\rho\Lambda^\nu{}_\sigma = g_{\rho\sigma}.$$

Show that if Λ_1 and Λ_2 obey the condition, then $\Lambda_3^\mu{}_\nu = \Lambda_2^\mu{}_\alpha\Lambda_1^\alpha{}_\nu$ obeys the condition. That is, show that the product of two Lorentz transformations is a Lorentz transformation.

3.) Problem 2.4 from Srednick

4.) Problem 2.5 from Srednick

5.) Problem 2.9 from Srednick