

# Rutgers Physics 619 (Fields II) HW3

Instructor: David Shih

Due date: Monday, March 19, 2018

- 1) Srednicki 59.2
- 2) Peskin 5.2 (you should probably do problem 1 first)
- 3) Srednicki 59.3
- 4) In class we derived the ultra-high-energy limit of pair annihilation by essentially setting  $m \rightarrow 0$ . We found a result that diverged at  $\theta = 0$  and  $\theta = \pi$ . Restore the  $m$  dependence and verify that the scattering is cut off at  $\sin \theta \sim m/p$ . (You can demonstrate this by making a plot.)
- 5) Fill in the missing steps in the derivation of the Klein-Nishina formula, eq (5.91) of Peskin & Schroder. You should start from the form of  $\langle |\mathcal{M}|^2 \rangle$  for Compton scattering derived in class. (If your notes are incomplete, rederive it.)