

Final: Due 12-19-2024 at 5:00pm

PHYSICS 561, Fall 2024

You should work the exam independently. It is important that you work as much of the exam as possible. Time should not be a problem. If you need help getting started or are stuck, stop by.

1. Problems in Text: 6.6,12.8,12.9,13.3, 15.1, 15.2, 15.3 (replace Eq. (15.29) with Eq. (15.49)), 16.1, 16.3.
2. Evaluate Eq. 16.32 at $x = 0$ and $\omega = 0$. Then evaluate $n = 2\theta(G_i^R(\omega = 0))$ as a function of μ in three cases: a) $\mu < 0$, b) $\mu = 0$ and c) $\mu > 0$. Interpret your result in light of Eq. 7.51 which states that counting the sign changes of the Green function determines uniquely the charge density. Note you have set $x = 0$ and hence $n = 1$. What does your result say about associating zeros of the Green function with the charge density?