

215a Homework exercises 2, due Oct. 15

Homework exercise key: “Luke problem $n.m$ ” refers to exercise set n , problem m . Likewise for Tong. Follow links from website.

1. Tong 2.3 (problem about P^μ operator).
2. Tong 2.5 (show $\langle 0|\phi(x)|p\rangle = e^{-ip\cdot x}$). Note that Tong’s normalization of the creation and annihilation operators differ by $a(k)_{here} = \sqrt{2\omega_k}a(k)_{Tong}$, but that change drops out in the end, since $\phi_{here} = \phi_{Tong}$ and $|p\rangle_{here} = |p\rangle_{Tong}$. Both normalizations are common, so it’s good for you to get used to seeing either one.