

Ex 1.1

Haowei

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Density operator $\hat{n}(x) \equiv \hat{\psi}^\dagger(x)\hat{\psi}(x)$,

$$\begin{aligned} [\hat{n}(x), \hat{\psi}(x')]_- &= [\hat{\psi}^\dagger(x)\hat{\psi}(x), \hat{\psi}(x')]_- \\ &= \hat{\psi}^\dagger(x)[\hat{\psi}(x), \hat{\psi}(x')]_{\mp} \pm [\hat{\psi}^\dagger(x), \hat{\psi}(x')]_{\mp}\hat{\psi}(x) \\ &= -\delta(x-x')\hat{\psi}(x) \end{aligned}$$

$$\begin{aligned} [\hat{n}(x), \hat{\psi}^\dagger(x')]_- &= [\hat{\psi}^\dagger(x)\hat{\psi}(x), \hat{\psi}^\dagger(x')]_- \\ &= \hat{\psi}^\dagger(x)[\hat{\psi}(x), \hat{\psi}^\dagger(x')]_{\mp} \pm [\hat{\psi}^\dagger(x), \hat{\psi}^\dagger(x')]_{\mp}\hat{\psi}(x) \\ &= \delta(x-x')\hat{\psi}^\dagger(x') \end{aligned}$$