Worksheet #5

(Wednesday, January 14, 2026)

Name

Question (5 pts):

Consider the number operator $N = a^\dagger a$, where $a^\dagger$ and a are creation and annihilation operators, respectively.

(a) Find the commutator $[N, a^\dagger]$

(b) **If you have time:** use properties of the number operator N to find the following:

$\langle n| a^\dagger a |n\rangle =$

$\langle n| aa^\dagger |n\rangle =$