Phys 551 **Winter 2026**

Worksheet #9

(Monday, January 26, 2026)

Name

Questions (5 pts):

As we discussed, the Schroedinger's equation for the 1st-order perturbation leads to the following expression:

$\langle n^{(0)}| H_0 - E_n^{(0)}|n^{(1)}\rangle = \langle n^{(0)}|E_n^{(1)}\text{-}H'|n^{(0)}\rangle$

(a) Use the properties of the unperturbed Hamiltonian ($H_0 |n^{(0)}\rangle = E_n^{(0)} |n^{(0)}\rangle$) to simplify the left-hand-side of the expression above.

(b) Use your result of (a) to find the first-order energy correction $E_n^{(1)}$.