PHYS 451 Quantum Mechanics I (Spring 2020)
Quiz #1

Does the Heisenberg uncertainty principle hold for the ground state of 1D harmonic oscillator? Show that it does or does not using the wave function given by

$$\psi_0(x) = C\, e^{-\alpha x^2/2},$$

where C is the normalization constant, $\alpha = \frac{m\omega}{\hbar}$, m is the particle mass, and ω is the angular frequency of the oscillator.