StudentID: _____

PHYS 452: Quantum Mechanics II – Fall 2016
Quiz #1

Consider a 1D quantum system with the Hamiltonian

$$H = \frac{p^2}{2m} + Ax^2\frac{a^2 + x^2}{b^2 + x^2}, \qquad A, a, b > 0.$$

Is $(\alpha + \beta x^2)e^{-\gamma x^2}$ (where α, β, and γ are adjustable parameters) a good choice of a variational trial wave function for approximating the *first excited* state of this system? Why yes or why not?