

Q3P1

Due Friday by 2:15pm

Points 50

Submitting a file upload

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Available Apr 23 at 1:25pm - Apr 23 at 2:18pm about 1 hour

This assignment was locked Apr 23 at 2:18pm.

The normalized wave function of an energy eigenstate of the harmonic oscillator is $\psi(x) = \left(\frac{4}{\pi}\right)^{1/4} \left(\frac{\mu\omega}{\hbar}\right)^{3/4} x \exp\left(-\frac{\mu\omega x^2}{2\hbar}\right)$

where μ, ω are the mass and oscillation frequency, respectively.

When momentum is measured for this state,

(a) what are the possible values (5 points) and

(b) what is the probability of measuring a momentum between p and $p + dp$ (45 points)