FINAL EXAM (con't.)

4. A particle of mass m is bound in a one-dimensional potential $V = \frac{1}{2}kx^2$. The particle is in the ground state.

   (a) What is the probability $dP(x)$ that the particle is found at the location x within dx?

   (b) What is the value of $\langle X^2 \rangle$?