FINAL EXAM (con't.)

4. (continued)

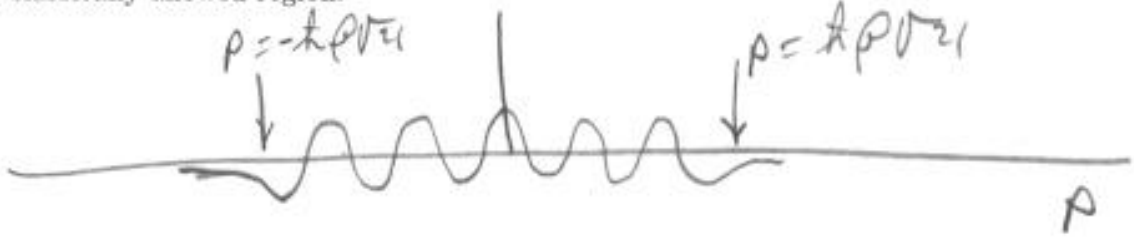
(d) What region of p is classically allowed? classically when

$x=0 \quad \frac{p^2}{2m} = E = \hbar\omega\left(\frac{21}{2}\right)$

$p = \pm\sqrt{\hbar\omega m}\sqrt{21} = \hbar\beta\sqrt{21}$

$-\hbar\beta\sqrt{21} < p < \hbar\beta\sqrt{21}$

(e) Make a sketch of the energy eigenfunction, $u_{10}(p)$, in momentum space. Indicate the classically allowed region.



(f) What is Δp for this state?

$\Delta p = \sqrt{\langle p^2\rangle - \langle p\rangle^2}$ in manner similar to (c) $\Delta p = \hbar\beta\sqrt{\frac{21}{2}}$