OPTI 570 RECAP Th Sep 1

$$|\psi\rangle_{\{u\}} = \begin{pmatrix} 1/\sqrt{3} \\ i\sqrt{2/3} \\ 0 \end{pmatrix} \Rightarrow |\psi\rangle_{\{v\}} = \frac{1}{\sqrt{2}} \begin{pmatrix} 1/\sqrt{3} \\ 2i/\sqrt{3} \\ 1/\sqrt{3} \end{pmatrix}$$

$$\langle\psi|\psi\rangle_{\{u\}} = \begin{pmatrix} 1/\sqrt{3} & -i\sqrt{2/3} & 0 \end{pmatrix} \begin{pmatrix} 1/\sqrt{3} \\ i\sqrt{2/3} \\ 0 \end{pmatrix} =$$

$$= \frac{1}{3} + \frac{2}{3} + 0 = 1 \checkmark$$

$$\langle\psi|_{\{v\}} = \frac{1}{\sqrt{2}} \begin{pmatrix} 1/\sqrt{3} & -2i/\sqrt{3} & 1/\sqrt{3} \end{pmatrix}$$

$$\langle\psi|\psi\rangle_{\{v\}} = \frac{1}{\sqrt{2}} \begin{pmatrix} 1/\sqrt{3} & -2i/\sqrt{3} & 1/\sqrt{3} \end{pmatrix} \cdot \frac{1}{\sqrt{2}} \begin{pmatrix} 1/\sqrt{3} \\ 2i/\sqrt{3} \\ 1/\sqrt{3} \end{pmatrix} =$$

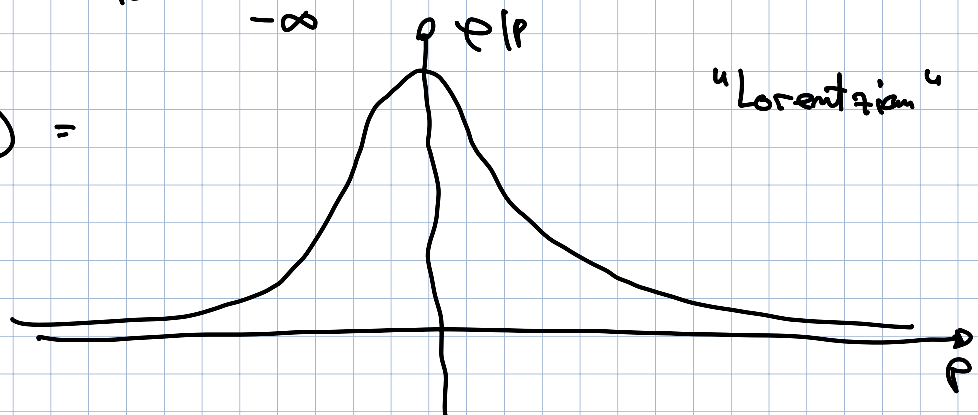
$$= \frac{1}{2} \cdot \left(\frac{1}{3} + \frac{4}{3} + \frac{1}{3} \right) =$$

$$= 1 \checkmark$$

Pset 2 : Q1 d.

$$\varphi(p) = \frac{1}{\sqrt{2\pi\hbar}} \int_{-\infty}^{+\infty} \varphi(x)\, e^{-ipx/\hbar}\, dx$$

$\varphi(p) =$



"Lorentzian" function.

$$\int_{-\infty}^{\infty} e^{-x \cdot A} \, dx = \int_{-\infty}^{0} e^{-x A} \, dx + \int_{0}^{\infty} e^{-x A} \, dx$$

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