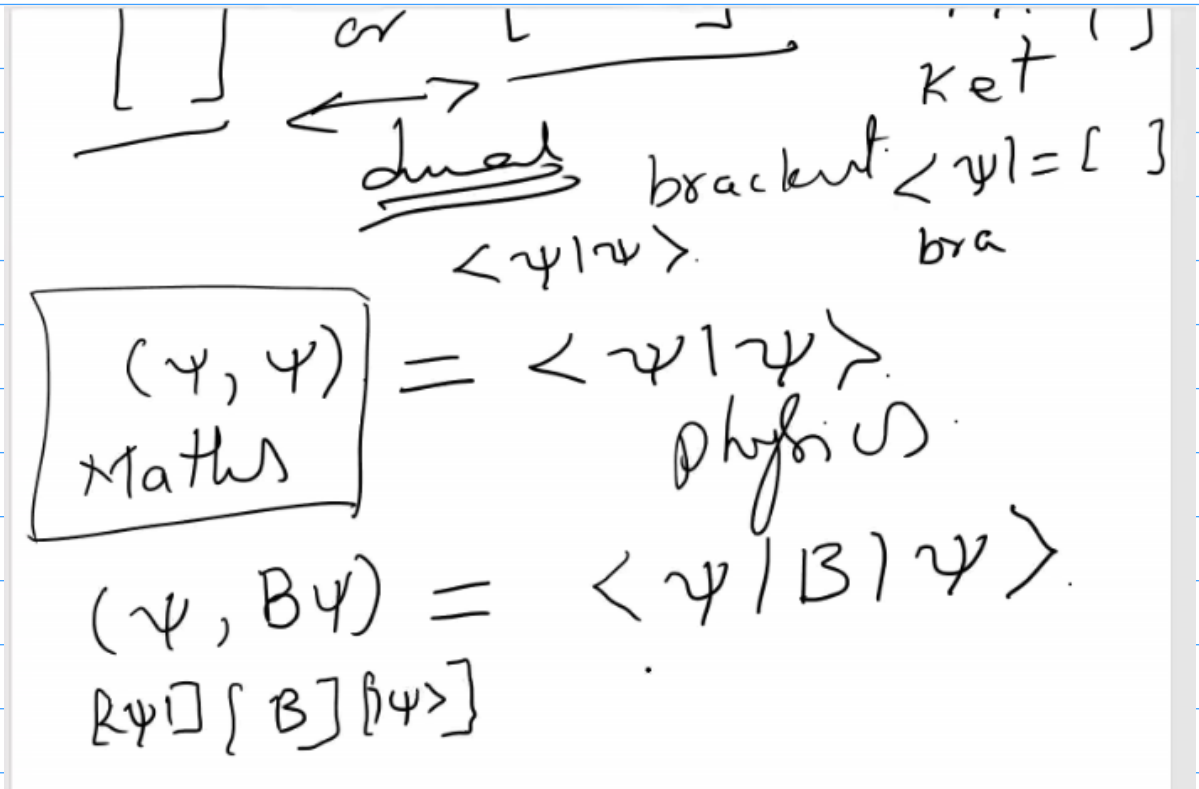
A vector in a complex vector space with inner prodct.



$$|\psi\rangle = \frac{\alpha}{\sqrt{2}}|\uparrow\rangle + \frac{\beta}{\sqrt{2}}|\downarrow\rangle$$

α, β → probability

$$= \frac{\alpha}{\sqrt{2}}\begin{bmatrix}1\\0\end{bmatrix} + \frac{\beta}{\sqrt{2}}\begin{bmatrix}0\\1\end{bmatrix} = \frac{1}{\sqrt{2}}\begin{bmatrix}\alpha\\\beta\end{bmatrix}$$

$|\psi\rangle$ Wave function | Prob. distribution

$$\langle\psi|\psi\rangle = \int_a^b \psi^* \psi \, d^3x = 1$$

Wave function doesn't mean anything

$$\underset{1\times n}{[\quad]}\underset{n\times 1}{\begin{bmatrix}\\\\\end{bmatrix}}$$

ψ is normalized

eg: $|\psi\rangle = \alpha_1^* |H\rangle + \alpha_2^* |C\rangle + \alpha_3^* |Sc\rangle$

$\langle\psi|\psi\rangle = \sum |\alpha_i|^2 = 1$

$\frac{1}{\sqrt{2}} |y\rangle + \frac{1}{\sqrt{2}} |T\rangle = |\chi\rangle$

$|\psi\rangle = \begin{bmatrix} \alpha \\ \beta \end{bmatrix}$ On time evolution?

$|\psi(t_0)\rangle \xrightarrow{t} |\psi(t)\rangle$

$|\psi(t)\rangle = U |\chi(t_0)\rangle$

$[\,]_{1\times n}$ $[n\times n]$ $[\,]_{1\times n}$ → n events. Sample space is fixed.

$\langle\chi(t)|\chi(t)\rangle = \langle\chi(0)|\chi(0)\rangle$

$\langle\chi(0)|U^\dagger U|\chi(0)\rangle$ $U^\dagger U =$

$U^\dagger$ (adjoint) → complex conj + transpose