

IF YOU GET CONFUSED W/ BRAS AND KETS YOU CAN RESORT TO WRITING EVERYTHING IN THE POSITION EIGENBASIS USING THE DICTIONARY:

$$|\psi\rangle \quad \psi(x) \quad \begin{pmatrix} \psi_1 \\ \psi_2 \\ \vdots \end{pmatrix}$$

$$\langle\psi| \quad \int dx \psi^*(x) \dots \quad (\psi_1^* \psi_2^* \dots)$$

↑ empty slot
for a function
to fill

$$\langle\psi|\psi\rangle \quad \int dx \psi^*(x) \psi(x) \quad (\psi_1^* \psi_2^* \dots) \begin{pmatrix} \psi_1 \\ \psi_2 \\ \vdots \end{pmatrix}$$

$$|\psi\rangle \langle\psi| \quad \psi(x) \int dy \psi^*(y) \dots \quad \begin{pmatrix} \psi_1 \\ \psi_2 \\ \vdots \end{pmatrix} (\psi_1^* \psi_2^* \dots) = \begin{pmatrix} \psi_1 \psi_1^* & \psi_2 \psi_1^* \\ \psi_2 \psi_2^* & \dots \\ \vdots & \dots \end{pmatrix}$$

$$\int dx |x\rangle \langle x| = \mathbb{1} \quad \int dx \delta(x-x') \delta(x-x'') = \delta(x'-x'') \quad \begin{pmatrix} 1 \\ 0 \\ \vdots \end{pmatrix} (10\dots) + \begin{pmatrix} 0 \\ 1 \\ \vdots \end{pmatrix} (010\dots) + \dots$$

↑ BRAS & KETS

↑ eigenbasis of position (continuous)

↑ any other (discrete) basis