1 Dimensional Analysis of Kets

(a) $\langle\Psi|\Psi\rangle = 1$ Identify and discuss the dimensions of $|\Psi\rangle$.

(b) For a spin-$\frac{1}{2}$ system, $\langle\Psi|+\rangle\langle+|\Psi\rangle + \langle\Psi|-\rangle\langle-|\Psi\rangle = 1$. Identify and discuss the dimensions of $|+\rangle$ and $|-\rangle$.

(c) In the position basis $\int \langle\Psi|x\rangle\langle x|\Psi\rangle\, dx = 1$. Identify and discuss the dimesions of $|x\rangle$.

2 ISW Right Quarter

A particle is confined in a one-dimensional infinite square well on $0 < x < L$. For each of the first three energy eigenstates (i.e., $n = 1, 2, 3$), calculate the probability that a position measurement yields a result in the region $\frac{3L}{4} < x < L$.