Question (5 pts):

Consider two unitary operators $U_{dx} = I - \frac{i}{\hbar} P_x \Delta x$, $U_{dy} = I - \frac{i}{\hbar} P_y \Delta y$ that translate the state vector along x and y axes by $\Delta x$ and $\Delta y$, respectively. Do the translations in different directions commute (in other words, find the commutator $[U_{dx}, U_{dy}]$ and draw your conclusion)?