1. Evaluate the commutators $[\hat{A}, \hat{B}]$ for the following pairs of operators $\hat{A}$ and $\hat{B}$:

   i) $\hat{A} = \frac{d^2}{dx^2}, \hat{B} = x$

   ii) $\hat{A} = \frac{d}{dx} - x, \hat{B} = \frac{d}{dx} + x$

2. Consider operators acting on a set of functions $f_n(x)$ that are defined on the interval $(0, 2\pi)$ and possess periodic boundary conditions, i.e., each $f_n(x)$ satisfies $f(x + 2\pi) = f(x)$. Analyze matrix elements of the following operators to determine which of them is Hermitian:

   i) $\frac{d}{dx}$

   ii) $i\frac{d}{dx}$

   iii) $x\frac{d}{dx}$

   iv) $x$