Read/review Sections 6.1 - 6.4. Then answer the following questions.

1. Find the inner product $\langle x, y \rangle$ in $\mathbb{C}^2$ given $x = (2 - i, 1 + i)$ and $y = (2 - i, 2 - i)$.

2. Under what conditions can you guarantee a vector space V has an orthonormal basis? Given a vector space with these conditions and any basis, what process could you use to find an orthonormal basis?

3. Suppose $V = \mathbb{R}^3$ and $S = \{e_1\}$. Describe $S^{\perp}$.

4. What is the definition of a normal linear operator? What is the definition of a self-adjoint linear operator?

5. Suppose T is normal linear operator on a finite-dimensional complex inner product space. Is T diagonalizable?