Read Section 6.5 and answer the following questions.

1. Give an example of an operator on a real vector space that is not orthogonal.

2. True or False: The sum of two unitary operators is unitary. If true, prove it. If false, give a counterexample.

3. What does it mean for a matrix A to be unitarily equivalent to a diagonal matrix? What does it mean for a matrix A to be orthogonally equivalent to a diagonal matrix?

4. Describe the kinds of orthogonal operators on $\mathbb{R}^2$.