All problems are to be written up clearly and thoroughly, using complete sentences. This assignment is due in discussion at 2pm on Tuesday, February 11th.

For all T/F problems on the homework, provide a brief justification for your answer. That may be citing an appropriate theorem or providing a counterexample.

1. From the book:

   Section 6.5 problems 2 d, 9, 10, 15, 16, 21

   Section 6.6 problems 1, 2, 4

2. Let T be a linear operator on a finite-dimensional inner product space.

   (a) Show that if T is self-adjoint and nilpotent then $T = 0$.

   (b) Show that part (a) may fail if T is not self-adjoint by constructing a counterexample.