All problems are to be written up clearly and thoroughly, using complete sentences. This assignment is due in discussion at 2pm on Thursday, May 23rd.

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. Section 5.1 problems 4 a, d, e, h, 6, 8, 9, 10, 11, 14, 15, 17

2. Section 5.2 problems 1, 2, 3

3. Compute the number of invertible matrices A in $M_{n \times n}(\mathbb{F}_p)$.

4. A matrix $A \in M_{n \times n}(\mathbb{F})$ is called *nilpotent* if there exists a k such that $A^k = 0$. Show that if A is nilpotent then $I_n - A$ is invertible. (*Hint:* think about the power series of $(1 - x)^{-1}$).