All problems are to be written up clearly and thoroughly, using complete sentences. This assignment is due in discussion at 2pm on Thursday, April 18th.

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 1.4 problems 1, 3 d, 4 e, 6 (as long as $\mathbb{F}$ does not have characteristic 2), 7, 8 (Here $P_n(F)$ is the set of polynomials of degree less than or equal to n with coefficients in a field $\mathbb{F}$), 9, 10, 11, 12, 13

2. Section 1.5 problems 1, 2 a, c, e, 4, 5, 6, 8, 9, 11, 15, 16, 18, 20

3. Let $\mathbb{C}[x]$ be the vector space of polynomials and let $W = \text{span}\{x^a \mid a > 2\}$.
   (a) Find a set of three linearly independent elements of the quotient space $\mathbb{C}[x]/W$ (see Section 1.3 problem 31).
   (b) Find two nonzero elements $p(x), q(x) \in \mathbb{C}[x]$ that are linearly independent in $\mathbb{C}[x]$ but where $p(x) + W$ and $q(x) + W$ are linearly dependent and both nonzero in $\mathbb{C}[x]/W$.