### Assignment 6

**Due on 2020-12-18 23:59 UTC**

1. State, Chapter 16, Exercise 38: Let $f$ be the trace of a positive circuit of a ring $R$. If $A$ and $B$ are $f$-hermitian, then the symmetric difference of $A$ and $B$ is also $f$-hermitian.

2. In a ring with identity, prove that $A - B$ is a subset of $A + B$.

3. A ring cannot be a group if $A = 0$ for every element $A$ in the ring. Prove this by showing that the ring is commutative.

4. Which of the following are integral domains?
   - $S_f$ (true)
   - $S_g$ (false)
   - $S_h$ (true)
   - $S_i$ (true)

5. Prove that if $A$ is an integral domain, then $A[x]$ is also an integral domain.

6. For which of the following groups is the group ring an integral domain?
   - $G_1$ (true)
   - $G_2$ (false)
   - $G_3$ (true)
   - $G_4$ (true)

7. Let $R$ be a ring and $a$, $b$ be elements of $R$. If $a + b = 0$, then $a = -b$.

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