# Algebra Theorems

On Rings, Polynomials, and Fields

## 1 Section 16.2 - Integral Domains and Fields

1. **Prop. 16.15. Cancellation Law.** Let $D$ be a commutative ring with identity. Then $D$ is an integral domain iff for all nonzero elements $a \in D$ with $ab = ac$, we have $b = c$.

2. **Theorem 16.16.** Every finite integral domain is a field.

3. **Lemma 16.18.** Let $R$ be a ring with identity. If 1 has order $n$, then the characteristic of $R$ is $n$.

4. **Theorem 16.19.** The characteristic of an integral domain is either prime or zero.