# Math 542-Modern Algebra II

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**Problem:**
(Wed Mar 5) $p$ is a prime and $n$ a positive integer. Prove:

(a) If $F$ is a field such that $|F| = p^n$ and $m$ is a positive integer then there is a field $E$ with $F \subseteq E$ and $E = p^{nm}$.

(b) If $F \subseteq E$ are fields, $|F| = p^n$ and $|E| = p^N$, then $n$ divides $N$.

**Solution:**
Solution goes here!