# WRITTEN 4, MATH 369.101

Due: 10/05/2016

(1) Assume that $\phi : \mathbb{E} \to \mathbb{F}$ is an isomorphism between fields $\mathbb{E}$ and $\mathbb{F}$. For a polynomial $p(x) \in \mathbb{E}[x]$, suppose that $p(x) = p_0 + p_1 x + \ldots + p_n x^n$ (so $p_i \in \mathbb{E}$ for all $0 \le i \le n$). Let's use $\phi(p)(x)$ for the polynomial $\phi(p_0) + \phi(p_1)x + \ldots + \phi(p_n)x^n \in \mathbb{F}[x]$. Show that if $p(x)$ has a root in $\mathbb{E}$ then $\phi(p)(x)$ has a root in $\mathbb{F}$.

(2) Do problem #15 on page 210.

(3) Do problem #20 on page 210.

(4) Do problems #5(a) and #5(b) on page 219.