

MATH 8202 HOMEWORK #3 (DUE FRIDAY, MARCH 8).

2/25/2013

Turn in the starred problems only.

Problems 2, 3*, 4, 5, 6, 7*, 8*, 10*, 11, 19, 20*, 26* in Chapter V in Lang.

Additional problem:

1*. Let k be a field and let $k(X)$ be the field of rational functions over k . Let E be a subfield of $k(X)$ containing k , but different from k . Prove that E is isomorphic to $k(X)$.

(You will need the result in problem 20 for the proof. This is known as Lüroth's Theorem. Its generalization for rational functions in two variables is also true, but the proof is *much* harder. It is also known that the generalization is false for more than two variables - an even deeper result!)