2016 NAP Lecture Part II, Problem 3

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To solve the following problems, we assume all arguments in Chapter 1 and Chapter 2.
From Example 2.17.

Problem II-7] Let F be a finite field. Show that it is a perfect field.

Problem II-8] Let E_1, E_2 be both perfect fields. Suppose $E = E_1 \cup E_2$ be a field again. Show that E is a perfect field.
(Note that $\mathrm{char}(E_1) = \mathrm{char}(E_2) = \mathrm{char}(E)$)

Problem II-9] Let E be an algebraic extension of $\boldsymbol{F}_p$. Show that E is a perfect field.

Problem II-10] Let E be an algebraicaly closed field. Show that E is a perfect field.

Problem II-11] Let F be a field with $\mathrm{char}(F) = p > 0$. Show that $E = F(X)$ is not a perfect field.

NAP Lecture Part II Exercises Sheet

Given Name Family Name Date: d /m /2016

Status Specialized Field