代數學II預習測驗 #08

5/16/2014(五)

姓名：_____ 系級：_____ 學號：_____ 分數：

Read Chapter 20 (pages 368-372) and finish the following problems.

1. Give the criterion for multiple zeros (Theorem 20.5).

2. Let $f(x)$ be an irreducible polynomial over a field F. Use the above criterion to prove that if F has characteristic 0, then $f(x)$ has no multiple zeros.

3. As above, prove that if F has characteristic $p \neq 0$, then $f(x)$ has a multiple zero only if it is of the form $f(x) = g(x^p)$ for some $g(x)$ in $F[x]$.

4. Give the definition for perfect field.

5. Let $f(x)$ be an irreducible polynomial over a field F and let E be a splitting field of $f(x)$ over F. Then all the zeros of $f(x)$ in E _____ .

6. Let $f(x)$ be an irreducible polynomial over a field F and let E be a splitting field of $f(x)$ over F. Then $f(x)$ has the form _____

   where _____ .