NAP 2019, MODULE II, HOMEWORK ASSIGNMENT #2
DUE MONDAY, JUNE 3, 2019

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• **Homework assignment** (due Monday, June 3, 10pm Kathmandu Time).

Solve problems

      5.3, 5.4, 5.5, 5.6, 5.7, 5.8 and 5.9 of Chapter 5 (p. 50 – 52),

      5.10, 5.11 and 5.12 of Chapter 5 (p. 53),

      6.4, 6.5, 6.6 and 6.7 of Chapter 6 (p. 57 – 58).

`Comments.`

    • In Problem 5.4 of Chapter 5 p. 50, x and y are two independent variables.
Prove first that the polynomial $f - yg$ is irreducible as a polynomial in x with coefficients in the ring $K[y]$. Next use Gauss's Lemma (Corollary of Theorem 3.12).

    • Problem 5.9 of Chapter 5 p. 52.
Prove first the following result. Let L be a field, E, F, K subfields with $K \subset E \cap F$. Assume E and F have finite degree over K, say m and n, where m and n are relatively prime. Prove that the field $K(E, F)$ has degree mn over K.

    • Problem 5.12 of Chapter 5 p. 53. First solve Problem 5.11.