Corrections to
Advanced Algebra, Digital Second Edition

Page 451, line −7. Insert the following sentence after the word "Remarks": "Corollary 8.21 of *Basic Algebra* shows that $A[X]$ is a unique factorization domain."

Page 452, line 7. Change "But" to "Since".

Page 452, line 8. Delete "and thus".

Page 452, line 9. Insert "by Corollary 8.21 of *Basic Algebra*" after "domain" and before the comma.

Page 453, line 4. Change "statement" to "statements".

Page 453, line −3 of the top proof. Insert the following sentence right before "If both": "This proves existence of a and b."

Page 453, end of top proof. Insert an additional paragraph before the end-of-proof symbol, as follows: "For uniqueness of a and b when $R(f-g) \neq 0$, suppose there are two distinct pairs (a, b) with $af+bg = R$. Taking the difference of the two equations leads to an equation $af + bq = 0$ with $\deg a < n$ and $\deg b < m$. The implication that (b) implies (c) shows that $R(f, g) = 0$, and this conclusion contradicts the assumption that $R(f, g) \neq 0$.

Page 454, line 4 of the large bracketed display in the middle. Change "with $i \le n' + j \le m' + i$" to "with $i \le n' + j \le n' + i$".

Page 456, last line of Section 2. Change "$(h) \subseteq (f) \cap (g)$" to "$(h) \supseteq (f) \cap (g)$".

Page 466, line 2. Change "Consequently" to "Since $y_iX - x_iY$ is irreducible in $K[X, Y]$, the principal ideal $(y_iX - x_iY)$ is prime, and Corollary 7.2 of the Nullstellensatz shows that".

Page 492, line −5. In the display in the example, change the term "$2XY$" to "$2XY^2$".

Page 500, line −6. A set of parentheses is missing around the rightmost f_j in the middle member of the displayed inequalities. Change the middle member so that it reads "$\max\big(\text{LM}(a_jf_j), \text{LM}\big(\text{LT}(p)/\text{LT}(f_j)\big)\text{LM}(f_j)\big)$".

Page 501, lines 1–2. Replace "Since $\text{LM}(p) = \text{LM}(\text{LT}(p))$, Proposition 8.18 shows that $\text{LM}(p)$ strictly decreases" by "Since $\text{LT}(p) = \text{LT}(\text{LT}(p))$, Proposition 8.18 shows that $\text{LM}(p - \text{LT}(p)) < \text{LM}(p)$, and thus $\text{LM}(p)$ strictly decreases".

Page 501, line −10. Change "$\text{LM}(I)$" to "$\text{LT}(I)$".

Page 504, line −1. Change "$\sum_{j,k}$" on the right side to "$\sum_{j<k}$".

Page 506, line −10 of text. Change "8.23c" to "8.23b".

Page 508, line 2 of the remark with Lemma 8.27. Change "$j \ge 1$" to "$j \ge 2$".

Page 509, lines −14 and −13. Change "We conclude that $k = i$ and that $\text{LM}(h_i) = \text{LM}(g_i = h_i)$" to "We conclude that $k = i$. The divisibility in $(*)$ then implies that $\text{LM}(h_i) \le \text{LM}(g_i - h_i)$."

Page 510, second display. Change "$=$" to "$\ge$".

Page 512, line −4. Change "a_if_i" to "a_ig_i".

Page 513, line 4. In the second term of the right member of the displayed equality, change the numerator of the fraction from "$\text{LCM}\big(\text{LM}(g_k), \text{LM}(g_k)\big)$" to "$\text{LCM}\big(\text{LM}(g_j), \text{LM}(g_k)\big)$".

Page 513, lines 5–6. Change "since the monomial ordering is of k-elimination type" to "since $g_1, \ldots, g_t$ by construction are all in $K[X_{k+1}, \ldots, X_n]$".

Page 513, line −15. Change "4^{th}" to "3^{rd}".

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