Ideals, Varieties and Algorithms

Errata for the second printing as of April 3, 1998

Page 5, line -2: "$= \ldots =$" should be "$= \cdots =$"

Page 20, line 8: "at this point is given by" should be "at the point given by"

Page 24, part a of Exercise 8: "0, 1, 2. or 3" should be "0, 1, 2, or 3"

Page 33, line -1: "f_n" should be "f_s" (twice)

Page 40, line -9: "the generator of an ideal" should be "the generator of an ideal in $k[x]$"

Page 53, line 9: "$x^2 \cdot$ (leading term of g)" should be "$x^3 \cdot$ (leading term of g)"

Page 54, line -3: "is S" should be "in S"

Page 65, line -9: "f_i" should be "f_s"

Page 70, statment of Theorem 5: "x_α" should be "x_n"

Page 71, proof of Corollary 6: "$n\alpha_0$" and "$(n+1)\alpha_0$" should be "$m\alpha_0$" and "$(m+1)\alpha_0$"

Page 73, part b of Exercise 12: "the gradlex order $>_{gradlex}$" should be "the grlex order $>_{grlex}$"

Page 79, Exercise 5: "initial form" should be "leading term"

Page 80, Exercise 13: "$N \ \geq 1$" should be "$N \geq 1$"

Page 81, part (i) of Proposition 1: "by one of" should be "by any of"

Page 81: The sentence "In particular ... algorithm" which follows the statement of Proposition 1 should be part of the statement of the proposition.

Page 81, second paragraph of the proof: "by one of" should be "by any of"

Page 83, line -5: "leading term 1" should be "leading coefficient 1"

Page 84, line -8, "$\max(m(1), \ldots, m(s))$" should be "$\max(m(1), \ldots, m(t))$"

Page 89, line -11: "adjoined to G'" should be "adjoined to G"

Page 94, line 4 of Example 1: "$x^2y^2 - z^3$" should be "$-x^2y^2 + z^3$"

Page 106, paragraph beginning "From equation (3)": The "(3)" should be "(4)"

Page 107, Equation (7): "$\text{multideg}(a_{ij})$" should be "$\text{multideg}(a_{ij}g_i)$"

Page 114, line -11: "Note that different orderings" should be "Also observe that different orderings"

Page 122, statement of Theorem 2: "factors" should be "components"

Page 125, statement of Corollary 4: "factors" should be "components"

Page 126, line -3: "At the end of Chapter 2" should be "In §8 of Chapter 2"

Page 129, line -6: "parameterization" should be "parametrization"

Page 130, third line after (6): "$g_1 \cdots g_n$" should be "$g_1 g_2 \cdots g_n$"

Page 136, line 2: "$\mathbf{V}(g)$" should be "$\mathbf{V}(f)$"

Page 144, line 1: "§7 of Chapter 2" should be "§8 of Chapter 2"

Page 145, line 3: "the t values of where" should be "the values of t where"

Page 148, line 9: "f and g" should be "g and h"

Page 149, line 19: "Proposition 1" should be "Proposition 2"

Page 151, lines -10 and -11: "contradicts (iii)" should be "contradicts (ii)"

Page 153, line -4: "eliminate y" should be "eliminate x"

Page 156, first line and second to last line of Exercise 6: "Exercise 13" should be "Exercise 14"

Page 157, Hint to part a of Exercise 12: "$\widetilde{A}$ is constant and $\widetilde{B}$ is linear" should be "$\widetilde{A}$ is linear and $\widetilde{B}$ is constant"

Page 157, part b of Exercise 13: "Propositions 6 and 7" should be "Propositions 8 and 9"

Page 157, hint to Exercise 14: "rows" should be "columns"

Page 157, line -1: "$l \leq m$" should be "$l \geq m$"

Page 162, line 12: "$u_2^{\alpha_1} \cdots u_s^{\alpha_s}$" should be "$u_2^{\alpha_2} \cdots u_s^{\alpha_s}$"

Page 163, lines -3 and -1: "$h(x_1, \mathbf{c}, u_2, \ldots, u_s)$" should be "$h(\mathbf{c}, u_2, \ldots, u_s)$"

Page 164, lines 4 and 7: "$h(x_1, \mathbf{c}, u_2, \ldots, u_s)$" should be "$h(\mathbf{c}, u_2, \ldots, u_s)$"

Page 164, line 5: "equation (4)" should be "equation (3)"

Page 164, line 12: "combine (9) and (10)" should be "combine (8) and (10)"

Page 164, line -7: "$f_2 + x_1^N f_2$" should be "$f_2 + x_1^N f_1$"

Page 165, Exercise 1: "$g = x^3y - 4y^2 + y + x^3 - 4y + 1$" should be "$g = x^3y + x^3 - 4y^2 - 3y + 1$"

Page 166, part a of Exercise 6: "$a_0(x_2, \ldots, x_i, \mathbf{c}) \neq 0$ and $a_0(x_2, \ldots, x_i, \mathbf{c}) \neq 0$" should be "$a_0(x_2, \ldots, x_i, \mathbf{c}) \neq 0$ and $b_0(x_2, \ldots, x_i, \mathbf{c}) \neq 0$"

Page 166, part b of Exercise 6: "used the proof" should be "used in the proof"

Page 166, first sentence of Exercise 7: "what happens when to a" should be "what happens to a"

Page 168, line -5: "Proposition 11 of Chapter 2, §4" should be "Proposition 9 of Chapter 2, §5"

Page 170, line -5: "factors" should be "components"

Page 171, display near top of page: "$f_k = 0$" should be "$f_s = 0$"

Page 178, line -18: "dicussion" should be "discussion"

Page 178, line -15: "§6 of Chapter 3" should be "§5 of Chapter 3"

Page 178, line -7: "Theorem 2 of Chapter 3, §6" should be "Theorem 5 of Chapter 3, §5"

Page 180, line 1: "xz and dividing xz by xy gives 0 plus remainder xy" should be "xy and dividing xz by xy gives 0 plus remainder xz"

Page 180, line 18: "use to the product rule" should be "use the product rule"

Page 181, Exercise 10: "$\langle h \rangle \supset J$" should be "$\langle h \rangle \subset J$"

Page 183, line 5: "If I and J be ideals" should be "If I and J are ideals"

Page 186, line -5: "On other hand" should be "On the other hand"

Page 189, line 3 of the proof of Theorem 15: "$x \in V(I \cap J)$" should be "$x \in \mathbf{V}(I \cap J)$"

Page 189, line -1: Delete "of f and g" at the end of the sentence.

Page 190, second line of Exercise 13: "Exercise 4 of §2" should be "Exercise 9 of §1"

Page 191, line 1: "$f \in k[x_1, \dots, x_n]$" should be "$f \in I$"

Pages 191–193: "algebraic variety" should be "variety", and similarly "algebraic vareities" should be "varieties"

Page 192, statement of Theorem 3: "factors" should be "components"

Page 195, line 6: "$\langle h_1, \dots, h_p \rangle \in I \cap \langle g \rangle$" should be "$\langle h_1, \dots, h_p \rangle = I \cap \langle g \rangle$"

Page 195, display in Exercise 7: "$\dots, x_n]$" and "$\dots, y_m]$" should be "$\dots, x_m]$" and "$\dots, y_n]$"

Page 198, line 8: "$\dots f_n(t_1, \dots t_m)$" should be "$\dots, f_n(t_1, \dots, t_m)$"

Page 198, line -7: "$F(t_1, \dots t_m)$", "$g_1(t_1, \dots t_m)$" and "$f_n(t_1, \dots t_m)$" should be "$F(t_1, \dots, t_m)$", "$g_1(t_1, \dots, t_m)$" and "$f_n(t_1, \dots, t_m)$"

Page 198, line -1: "$g_1(t_1, \dots t_m)$" should be "$g_1(t_1, \dots, t_m)$"

Page 199, line 4: "$k[t_1, \dots t_m]$" should be "$k[t_1, \dots, t_m]$"

Page 199, line 5: "is the zero" should be "is zero"

Page 199, line 15: "a irreducible" should be "an irreducible"

Page 199, line -10: "$x_1 - a_1, \dots x_n - a_n$" should be "$x_1 - a_1, \dots, x_n - a_n$"

Page 200, line 16: "$x_1 - a_1, \dots x_n - a_n$" should be "$x_1 - a_1, \dots, x_n - a_n$"

Page 201, line 5: "maximum ideal" should be "maximal ideal"

Page 202, line -1: "below" should be "on the next page"

Page 208, line -12: "Theorem 2 of §2" should be "Theorem 2 of §6"

Page 209, line 9: "Noether–Lasker" should be "Lasker–Noether"

Page 209, line 20: "minimal decomposition" should be "minimal primary decomposition"

Page 211, Exercise 10: "Propostion 16" should be "Proposition 16"

Page 214, line -15: "(x_2, x_3)" should be "(y, z)"

Page 227, Exercise 12: "the to mappings" should be "the two mappings"

Page 239, line -9: "$\alpha \circ \phi$" should be "$\phi \circ \alpha$"

Page 240, line -12: "some polyonomial" should be "some polynomial"

Page 247, line 11: "y/x^2" should be "x/y^2"

Page 247, line 18: "$f(y/x^2)$" should be "$f(x/y^2)$"

Page 247, line -9: "$a((y/x^2)^2) + (y/x^2)^5 b((y/x^2)^2)$" should be "$a((x/y^2)^2) + (x/y^2)^5 b((x/y^2)^2)$"

Page 247, line -8: "$a(y^2/x^4) + (y^5/x^{10}) b(y^2/x^4)$" should be "$a(x^2/y^4) + (x^5/y^{10}) b(x^2/y^4)$"

Page 247, line -7: "$y^2 = x^5$, so $y^2/x^4 = x$ and $y^5/x^{10} = yx^{10}/x^{10} = y$" should be "$x^2 = y^5$, so $x^2/y^4 = y$ and $x^5/y^{10} = xy^{10}/y^{10} = x$"

Page 248, line 11: "From (2), if" should be "From (2), it"

Page 254, part a of Exercise 13: "$\psi \circ \psi$" should be "$\psi \circ \phi$"

Page 301, part ii of Theorem 4: "$\mathbf{V}(d_1, \ldots, d_n)$" should be "$\mathbf{V}(d_1 d_2 \cdots d_n)$"

Page 306, line 1: "affect" should be "effect"

Page 311, line 3: "down Groebner" should be "down a Groebner"

Page 322, part c of Exercise 4: "$M_{\tau\nu}$, where $\tau\nu$ is the permutation taking i to $\tau(\nu(i))$" should be "$M_{\nu\tau}$, where $\nu\tau$ is the permutation taking i to $\nu(\tau(i))$"

Page 323, part d of Exercise 6: "I_2" should be "I_3"

Page 341, line -14: "whereas V_F depends" should be "whereas I_F depends"

Page 346, line 3: "that the we" should be "that we"

Page 352, line -2: "look by like" should be "look like"

Page 358, line 6: "$8 - 2^2 = 4 \neq 0$ should be "$8 - 4^2 = -8 \neq 0$"

Page 363, Exercise 3: "how a lines" should be "how lines"

Page 364, Exercise 11: "$f(1, x_1, \ldots, x_n)$" should be "$f(x_1, \ldots, x_n)$"

Page 364, part c of Exercise 15: "vareities" should be "varieties"

Page 381, line 12: "by the equations" should be "by the equation"

Page 428, line 1: "a ideal" should be "an ideal"

Page 432, line -5: "$k[x_1, \ldots, x_n]_s$" should be "$k[x_0, \ldots, x_n]_s$"

Page 438, parts a and b of Exercise 18: "${}^aHF_I(s) - {}^aHF_I(s)$" should be "${}^aHF_I(s) - {}^aHF_I(s-1)$"

Page 448, line 12: "$n - (d+1)$" should be "$n - d$"

Page 454, line 3: "$m \geq \dim V$," should be "$m \geq \dim V$."

Page 459, line 2: "z-axis" should be "y-axis"

Page 464, line 4: "charactersitic" should be "characteristic"

Page 466, line 1: "as the nonzero" should be "is the nonzero"

Page 466, line -9: "as defined in Definition 1" should be "as defined in Definition 1 of the previous section"

Page 488, line 19: "$x^2 + 2y^2$" should be "$x^2 + 3y^2$"

Page 492, line 15: "$x^2 + 2y^2$" should be "$x^2 + 3y^2$"

Page 495, line -2: "such a Maple" should be "such as Maple"

Page 500, line -15: "C. Hoffman" should be "C. Hoffmann"

Page 504, index entry for *curve, twisted cubic*: "363" should be "362", and "375, 376, 378" should be "366, 375, 376, 377f"