Page 55, line 1 of paragraph beginning “To begin”: “sum of monomials” should be “sum of monomials times coefficients”

Page 57, line 2 of the proof of part (ii) of Proposition 4: delete the sentence “But . . . = x^{β+γ}.”

Page 62, line 11: “monomial” should be “monomial times coefficient”

Page 73, line 9: “⟨x^α : α ∈ A⟩” should be “⟨x^α | α ∈ A⟩”

Page 79, line 13: “⟨g_1, g_2⟩” should be “{g_1, g_2}”

Page 86, line 1: “a sum of S-polynomials” should be “a k-linear combination of S-polynomials”

Page 94, line −16: “Proposition 5” should be “Theorem 5”

Page 96, line 4 of part (b) of Exercise 10: “x^ℓ D – x^s D” should be “x^ℓ C – x^s D”

Page 108, line following the first display: “x^{γ_j} = lcm(LM(g_j), LM(g_i))” should be “x^{γ_j} = lcm(LM(g_i), LM(g_j))”

Page 115, line −8: “If follows” should be “It follows”

Page 134, line −2: “Lemma 1 of §2” should be “Lemma 1 of §2 (which holds for any infinite field k)”

Page 139, line 6: “f_1(a)/g_1(a)” should be “f_1(a)/g_1(a)”

Page 160, part (i) of Corollary 7: “k[x_1]” should be “C[x_1]”

Page 168, part (i) of Corollary 7: “k[x_1]” should be “C[x_1]”

Page 167, line following (7): “x_1-deg(f) = m and x_1-deg(g) = l” should be “deg(f, x_1) = m and deg(g, x_1) = l”

Page 186, third display: “(f_1 f_2 ··· f_r)^N” should be “c(f_1 f_2 ··· f_r)^N”

Page 191, first display: “V(f_i g_j, 1 ≤ i ≤ r, 1 ≤ j ≤ s)” should be “V(f_i g_j | 1 ≤ i ≤ r, 1 ≤ j ≤ s)”
Page 200, line 13: “is Thus” should be “Thus”

Page 234, line 5 of **Definition 1**: “n-tuple” should be “n-tuple”

Page 271, third line of first display: The comma at the end of the line should be a period.

Page 273, first line of first display: The period at the end of the line should be a comma.

Page 277, line 2 of part (a) of Exercise 14: “VW(a^2 - b^2 + 4)” should be “VW(y^2 - z^2 + 4)” (two errors)

Page 283, line 2: “x_1 > \ldots > x_n > y_1 > \ldots > y_m” should be “x_1 > \ldots > x_n > y_1 > \ldots > y_m”

Page 283, line −11: “V(I_j)” should be “V(I_i)”

Page 334, line 3 of Exercise 17: “C’” should be “C’”

Page 372, part (b) of Exercise 11: “x^2y - xy^3” should be “x^3y - xy^3”

Page 391, line 1: “canvas” should be “canvas”

Page 400, lines −4 and −3: “x_1, \ldots, x_n” should be “x_1, \ldots, x_n”

Page 411, first display: “k[x_1, \ldots, x_n]” should be “k[x_0, \ldots, x_n]”

Page 411, line 4 of second display: “k[x_1, \ldots, x_n]” should be “k[x_0, \ldots, x_n]”

Page 460, line −2: “l_{pg} = 0” should be “ℓ_{pg} = 0”

Page 473, line 11: “\langle m_i \rangle” should be “\langle m_1 \rangle”

Page 495, lines 13, 14 and 20: The subscript “I^h” should be “S/I^h”

Page 498, part (b) of Exercise 18: “HF_I” should be “HF_{S/I}”

Page 498, part (b) of Exercise 18: in two places, “HF_I” should be “HFS/I”

Page 502, line −2: “by Proposition 6” should be “By Proposition 6”

Page 502, line −1: deg(“HF_{I,I}”) should be deg(“HPR_{I,I}”)

Page 507, line 10: “as s gets” should be “as s gets”

Page 514, line 1 of part (a) of Exercise 10: “f, f_1, \ldots, f_s” should be “f, f_1, \ldots, f_r”

Page 517, line 11: “\frac{\partial f}{\partial x_1}” should be “\frac{\partial f}{\partial x_1}”

Page 518, line 2: “If follows” should be “It follows”
Page 522, line 9: $\mathbf{V}(f_i) \cup \mathbf{V}(f_i)$ should be $\mathbf{V}(f_i) \cup \mathbf{V}(f_j)$

Page 533, line 1: “$k \to \infty$” should be “$i \to \infty$”

Page 534, line 5 of Exercise 1: “where $\frac{\partial^m}{\partial x_i^{e_i}}$” should be “where $\frac{\partial^m}{\partial x_i^{e_i}}$”

Page 541, line 3 of paragraph beginning “Our next proposition”: “is used),” should be “are used),”

Page 541, line −8: Replace “So by the remark . . . in the second case,” with “In the second case, the remark following Definition 1 implies that”

Pages 545 and 546: Example 6 uses lex order with $x > y$. However, to be consistent with Theorem 5, we need to use a graded order. Fixing this requires several changes in the example as follows:

Line 1 of Example 6: “$I = (x^2 + y^2 - 1, x + y^2 - 2)$ in $\mathbb{Q}[x, y]$, using lex” should be “$I = (x^2 + 1, xy + 1)$ in $\mathbb{Q}[x, y]$, using grlex”

Line 3 of Example 6: “$J = (x^2 + y^2 - z^2, xz + y^2 - 2z^2)$” should be “$J = (x^2 + z^2, xy + z^2)$”

Lines 4 and 5 of Example 6: Delete the sentence “But . . . homogenizing variable.”

First display of Example 6: Replace with “$G = \{x^2 + z^2, xy + z^2, y^2 z^2 + z^4, xz^2 - yz^2\}$”

Second display of Example 6: Replace with “$G^d = \{x^2 + 1, xy + 1, y^2 + 1, x - y\}$”

Line −2 of Example 6: “third and fourth polynomials are divisible by $\text{LT}(x + y^2 - 2) = x$” should be “first and second polynomials are divisible by $\text{LT}(x - y) = x$”

Line −1 of Example 6: “reduced lex Gröbner basis for $I$ is $\{y^4 - 3y^2 + 3, x + y^2 - 2\}$” should be “reduced grlex Gröbner basis for $I$ is $\{y^2 + 1, x - y\}$”

Page 548, line 2 of Exercise 3: “for all $g$” should be “for all $g \in G$”

Page 551, line −17: “studied in §2 of” should be “studied in §8 of”

Page 553, line 3 of Example 3: “$m \geq 0$” should be “$m \geq 2$”

Page 563, line 3: “$\xi_{d+r}$” should be “$\xi_{d+r}$”

Page 563, line −2: “the initial terms” should be “The initial terms”

Page 564, line 1: “$\Delta = 4 - 3 = 1$” should be “$\Delta = 13 - 12 = 1$”

Page 570, lines 2 and 3 of part (ii) of procedure ComputeM: “contains a product $x^\alpha f_\ell$ whose leading monomial equals $x^\beta$” should be “contains a product $x^\alpha f_\ell$ whose leading monomial divides $x^\beta$”

Page 571, line 12: “according the monomial” should be “according to the monomial”
Page 573, line 12: “an standard” should be “a standard”

Page 573, line 13: “$G_{new}$” should be “$G_{new}$”

Page 573, lines 10 and 11 of Example 3: “monomials in $\text{Mon}(H)$ whose leading terms are” should be “monomials in $\text{Mon}(H)$ which are”

Page 576, line 3: “$G_{old}$” should be “$G_{old}$”

Page 576, line 6: “$G_{new}$” should be “$G_{new}$”

Page 578, line −7: “in (5)” should be “in (4)”

Page 579, line 3: “$(xy + z, x^2)$” should be “$(-xy + z, x^2)$”

Page 579, line 5 of Example 2: “include $f_3$” should be “include $f_3 = S(f_1, f_2)$”

Page 579, line 7 of Example 2: “the $-e_2$” should be “$-e_2$”

Page 579, line −5: “the $xe_2$” should be “$xe_2$”

Page 583, line −11: “same leading term” should be “same signature”

Page 585, line 2: “$s(x^\gamma k) = s(h)$” should be “$s(cx^\gamma k) = s(h)$ for suitable $c$ and $x^\gamma$”

Page 585, lines 3 and 4: In two places, “$h - x^\gamma k$” should be “$h - cx^\gamma k$”

Page 585, line 7: “$f_2 = xy - z.$ and” should be “$f_2 = xy - z$, and”

Page 585, line 2 of the proof of Proposition 15: “is smaller” should be “is smaller than $s(h)$”

Page 587, second paragraph: Replace the third sentence and fourth sentences with the sentences below:

We will follow the discussion from section 7.1 of EDER and FAUGÈRE (2014). If $f \in G \cup S$ and $a$ is a monomial in $R$, then $af$ is said to be a rewriter in signature $M$ if $s(af)$ divides $M$. A rewriter in signature $M$ of maximal signature is called a canonical rewriter in signature $M$. An element $af$ with $f \in G \cup S$ and $a$ a monomial in $R$ is re writable if $f$ is not a canonical rewriter in signature $M = s(af)$. That is, $af$ is re writable if there is some $f' \in G \cup S$ such that $s(f')$ divides $s(af)$, but $s(f') > s(f)$. Assuming the signature of $g$ comes from a term $af$ as here, the Criterion function tests for the existence of such an $f'$ and returns true if there is one, so that $af$ is re writable. It is not necessary to compute the reduction of $g$ in this case, by the two propositions. Our Criterion is a simplified version of the Rewritable function (Algorithm 4) in EDER and FAUGÈRE (2014). That actually goes farther and tests both “halves” of an $S$-pair for re writable, based on further optimizations of this approach (see their Lemma 7.6).

Page 587, third line of second display: “$e_2$” should be “$e_2$”

Page 588, after first sentence at top of page: Add:
At this point, $G \cup S$, which consists of $e_1, e_2$ and the original Koszul syzygies, contains no $f'$ such that $s(f')$ divides $s(g) = -ye_2$, but for which $s(f') > -ye_2$. So the Criterion function returns the value \texttt{false}.

Page 590, \textbf{Exercise 3}: “Definition 10” should be “Definition 9”

Page 596, line $-3$: At the end of the display, “$+a_{13}a_{22}a_{31}$” should be “$-a_{13}a_{22}a_{31}$”

Page 632, reference “D. Mumford”: “cCorrrected” should be “Corrected”