Using Algebraic Geometry, *second edition*

December 20, 2023

Errata:

Page 9, line 4: Replace "$\alpha \cdot \mathbf{w}_1$ and $\alpha \cdot \mathbf{w}_1$" with "$\alpha \cdot \mathbf{w}_1$ and $\beta \cdot \mathbf{w}_1$"

Page 18, line 6: "second polynomial" should be "first polynomial"

Page 28, line 4: Replace "last" with "first"

Page 39, line −7: Replace "$\mathbf{V}(I) \subset \mathbb{C}^n$" with "$\mathbf{V}(I) = \{a \in \mathbb{C}^n : f(a) = 0 \text{ for all } f \in I\}$"

Page 45, part c of Exercise 9: Delete and replace with "Show that $1 = \sum_j (1/p_j(a_j))p_j$."

Page 46, Exercise 11: Add a new part c of the exercise as follows:

c. For readers familiar with the Hermitian inner product $\langle z, w\rangle = \sum_{i=1}^n z_i \overline{w}_i$ for $z, w \in \mathbb{C}^n$, let
$$h_i(x) = \prod_{j \neq i} \langle x - p_i, p_i - p_j\rangle.$$
Show that $g_i(x) = h_i(x)/h_i(p_i)$ satisfies part b.

Page 54, line 5: Replace "$L(x - \sum_j c_j x^{\alpha(j)}) = 0$" with "$L(x^\alpha - \sum_j c_j x^{\alpha(j)}) = 0$"

Page 55, line 2 of Exercise 2: Replace "$x^\alpha > x_1^a$" with "$x^\alpha \geq x_1^a$"

Page 55, line 2 of Exercise 3: Replace "let x^α be" with "let $x^\alpha = x_1^{a_1} \cdots x_n^{a_n}$ be"

Page 65, line 7 after the second display: Replace "$i_1 > \cdots > i_l$" with "$i_1 < \cdots < i_l$"

Page 71, lines 4–8 of the proof of Theorem (5.2): Replace "Hence we will only ... invertible matrix" with "Hence we will only discuss the broad outline of the proof. In the case when I is radical, it is possible to turn the sketch that follows into a rigorous proof."

Page 75, line −3: Replace "$-\text{rem}(p_{i-1}(t), p_{i-2}(t), t)$" with "$-\text{rem}(p_{i-2}(t), p_{i-1}(t), t)$"

Page 75, line −2: Replace "division of p_{i-1} by p_{i-2}" with "division of p_{i-2} by p_{i-1}"

Page 82, line 2 of Exercise 7: Replace "$\deg(r) < \deg(g)$" with "$\deg(r) < \deg(f)$"

Page 92, line 8: Replace "degrees $d_1, \ldots, d_n$" with "$d_0, \ldots, d_n$"

Page 97, lines 21 and line 24: Replace "Theorem (2.6)" with "Proposition (4.7)"

Page 100, line −2: Replace"Theorem (2.6)" with "Proposition (4.7)"

Page 101, part b of Exercise 10, line 2: Replace "Theorem (2.6)" with "Proposition (4.7)"

Page 102, part c of Exercise 11, line 2: Replace "multiplication by $(-1)^n$" with "multiplication by $(-1)^{n-1}$"

Page 102, part d of Exercise 11: Replace "Theorem (3.5)" with "Theorem (3.4)"

Page 106, line 2 of Exercise 8: Replace "total degree 420" with "total degree 210"

Page 107, line 2 of the proof of Proposition (4.7): Replace "$(n-1)!$ ways" with "$n!$ ways"

Page 108, line 2 of Exercise 11: Replace "D_3' " with "D_2' "

Page 109, line 3: Replace "Exercise 10" with "Exercise 11"

Page 113, part d of Exercise 22: Replace part d with "Use part c to show that the determinant in (2.8) vanishes whenever $F_0 = F_1 = F_2 = 0$ has a nontrivial solution."

Page 120, line 6 after display (5.12): Replace "$u_1 = \cdots = u_n = 0$" with "$u_1 = \cdots = u_{n-1} = 0$"

Page 123, line 11: Replace "$A = \mathbb{C}(u)[x_1, \ldots, x_n]/\langle u - x_n, f_1, \ldots, f_n\rangle$" with "$A = \mathbb{C}(u_0)[x_1, \ldots, x_n]/\langle u - x_n, f_1, \ldots, f_{n-1}\rangle$"

Page 123, line 19: Replace "$\widehat{A} = \mathbb{C}(u_0)[x_1, \ldots, x_{n-1}]/\langle \hat{f}_1, \ldots, \hat{f}_n\rangle$" with "$\widehat{A} = \mathbb{C}(u_0)[x_1, \ldots, x_{n-1}]/\langle \hat{f}_1, \ldots, \hat{f}_{n-1}\rangle$"

Page 125, last display: Replace "$F_0 = \cdots = F_n = 0$" with "$F_1 = \cdots = F_n = 0$"

Page 126, line 8: Replace "$f_0 = \cdots = f_n = 0$" with "$f_1 = \cdots = f_n = 0$"

Page 129, line −2: Replace "$x^\alpha/x_i^{d_i}$ has degree $\leq d - d_i$" with "$x^\beta/x_i^{d_i}$ has degree $\leq d - d_i$"

Page 131, lines 1 and 2 following second-to-last display: Replace "Exercise 12 of Chapter 2, §4" with "Exercise 12 of Chapter 2, §2"

Page 134, line 2 of Exercise 3: Replace "$(u_0, u_1, u_2, u_3) = (0, 1, 0, 0)$" with "$(u_0, u_1, u_2) = (0, 1, 0)$"

Page 137, line 14: Replace "both these types" with "both types"

Page 138, line −12: Replace "if $N \neq M$ is an ideal in R with $M \subset N \subset R$," with "if $N \not\subset M$ is an ideal in R,"

Page 138, lines −10 to −8: Replace "Therefore M ... contained in M." with "Therefore, every proper ideal of R is contained in M. Hence M is maximal and is the only maximal ideal of R."

Page 142, line 3: Replace "$\sum_{n\geq 0} f_n(x)$" with "$\sum_{m\geq 0} f_m(x)$"

Page 143, line 4: Replace "$f_n(x) = \displaystyle\sum_{\substack{\alpha\in\mathbb{Z}^n_{\geq 0}\\ |\alpha|=n}} c_\alpha x^\alpha$" with "$f_m(x) = \displaystyle\sum_{\substack{\alpha\in\mathbb{Z}^n_{\geq 0}\\ |\alpha|=m}} c_\alpha x^\alpha$"

Page 143, line 5: Replace the display with "$h_m = f_m g_0 + f_{m-1} g_1 + \cdots + f_0 g_m$."

Page 143, line 7: Replace "n" with "m"

Page 147, part c of Exercise 1: Delete "uniquely"

Page 147, part a of Exercise 2: Replace "$\mathbf{V}(x^2 - 2x + y^2, x^2 - 4x + 4y^4)$" with "$\mathbf{V}(x^2 - 2x + y^2, x^2 - 4x + 4y^2)$"

Page 147, part b of Exercise 2: Replace "$\langle x^2 - 2x + y^2, x^2 - 4x + 4y^4\rangle$" with "$\langle x^2 - 2x + y^2, x^2 - 4x + 4y^2\rangle$"

Page 149, line −18: Replace "note that that" with "note that the"

Page 152, line 6: Replace "Proposition (5.9)" with "Proposition (5.15)"

Page 152, line 3 of Exercise 3: Replace "$f_2 = 6y - x^3 + 9x$," with "$f_2 = 6y - x^3 + 9x = 0$,"

Page 152, line 1 of part e of Exercise 3: Replace "$\mathrm{Res}(f_1, f_2, y)$" with "$\mathrm{Res}^y(f_1, f_2)$ as defined in (5.14) of Chapter 3"

Page 152, line 4 of part e of Exercise 3: Replace "$\mathrm{Res}(f_1, f_2, x)$" with "$\mathrm{Res}^x(f_1, f_2)$"

Page 156, part c of Exercise 10, line 4: Replace "$A_i \Leftrightarrow f(p) = \lambda$" with "$A_i \Leftrightarrow f(p_i) = \lambda$"

Page 160, line −2: Replace "$\ker(M) \cap \mathbb{Z}^n_{\geq 0}$" with "$\ker(M) \cap \mathbb{Z}^n$"

Page 161, line −3: Replace "$S = \{1 + g \ : \ \mathrm{LT}(g) < 1\}$" with "$S = \{1 + g \ : \ g = 0 \text{ or } \mathrm{LT}(g) < 1\}$"

Page 163, line 1 of part a of Exercise 5: Replace "let $h \in A$" with "let $h \in \mathrm{Loc}_>(A)$"

Page 163, line 1 of part b of Exercise 5: Replace "Let $r \in R$" with "Let $r \in \mathrm{Loc}_>(A)$"

Page 166, lines −20 and −18: Replace "$t^a > t^{a'} x^\beta$" with "$t^a >' t^{a'} x^\beta$" (twice)

Page 171, line 3 of part c of Exercise 8: Replace "$1/(1 + h)$" with "$1/(1 + g)$"

Page 172, line 2 of Exercise 11: Replace "(for local orders)" with "(for degree-anticompatible orders)"

Page 172, line 1 of part a of Exercise 11: Replace "Let $>$ be a local order" with "Let $>$ be a degree-anticompatible order"

Page 193, line −2: Replace "When M and N are free modules," with "When $M = R^l$ and $N = R^m$,"

Page 197, line −10: Besides the 1994 paper [PW] by Park and Woodburn, we should also mention two other papers that deal with algorithmic aspects of the Quillen-Suslin result:

L. Caniglia, G. Cortiñas, S. Danón, J. Heintz, T. Krick and P. Solernó (working group N. Fitchas), *Algorithmic aspects of Suslin's proof of Serre's conjecture*, Comput. Complexity **3** (1993), 31–55

N. Fitchas and A. Galligo, *Nullstellensatz effectif et conjecture de Serre (théorème de Quillen-Suslin) pour le calcul formel*, Math. Nachr. **149** (1990), 231–253.

Page 199, line 4: "Equivalently. we think" should be "Equivalently, we think"

Page 200, line 18: Replace "one-one" with "one-to-one"

Page 201, line −2 of proof of Proposition (1.11): Replace "$\sum c_i m_i$" with "$\sum c_i f_i$"

Page 203, line 1: Replace "Let $\varphi : M \to N$." with "Let $\varphi : M \to N$ be an R-module homomorphism."

Page 203, line 2 of part a of Exercise 23: Replace "$\{af : a \in I, f \in M\}$" with "$\{\sum_{i=i}^{\ell} a_i f_i : a_i \in I, f_i \in M \text{ for } i = 1, \ldots, \ell\}$".

Page 203, line −16: Replace "We let $R = k[x, y]$" with "Let $R = k[x, y]$, where k is a field of characteristic different from 2,"

Page 203, lines −9 to −1: Delete and replace with the following:

a. Verify that $\mathbf{f} = (f_1, f_2, f_3)^T = (1, -x/2, -1/2)^T \in R^3$ satisfies $(1+x)f_1 + (1-y)f_2 + (x+xy)f_3 = 1$.

b. Let I be the 3×3 identity matrix. Verify that the columns $\mathbf{g}_1, \mathbf{g}_2, \mathbf{g}_3$ of the matrix $I - \mathbf{f} \cdot A$ span $\ker A$. Hint: If $A\tilde{\mathbf{f}} = 0$, then $\tilde{\mathbf{f}} = (I - \mathbf{f} \cdot A)\tilde{\mathbf{f}}$ is a linear combination of the columns of $I - \mathbf{f} \cdot A$.

c. Show that $\{\mathbf{g}_1, \mathbf{g}_2\}$ is a basis of $\ker A$. (Unfortunately, the result of part c is special to the choice of $\mathbf{f}$ made in part a. If $\mathbf{f}$ is an arbitrary solution of $A\mathbf{f} = 1$, then the first two columns of $I - \mathbf{f} \cdot A$ need not give a basis of the kernel.)

Page 204, part b of Exercise 27, line 2: Replace "of f is a nonzero element of R" with "of $\mathbf{f}$ is a nonzero element of k"

Page 205, line 5: Replace "show that M" with "then M"

Page 205, line 6: Replace "R^l to R^m" with "R^m to R^l"

Page 206, line 1: Replace "(compare Exercise 6 and the discussion preceding Exercise 7)" with "(compare Exercise 11 and the discussion preceding Proposition (1.10))?

Page 206, line 3, Replace "column e_2" with "column e_1"

Page 206, line 5, Replace "row 2 column 1" with "row 1 column 2"

Page 210, lines −9 and −8: Replace "(see Exercise 5 below)" with "(see Exercise 11 of §3)"

Page 211, Exercise 1: Replace "Show" with "Assuming conditions a and b, show"

Page 215, line 10: Replace "$M_{M+\ell}$" with "$M_{N+\ell}$"

Page 215, bottome line: Replace "(1.6)" with "(1.5)"

Page 219, part a of Exercise 2, line 2: Replace "`(dp,C)`" with "`(dp,c)`"

Page 219, line −5: Replace "letter `C`" with "letter `c`"

Page 219, line −3: Replace "lower-case `c`" with "upper-case `C`"

Page 219, lines −2 and −1: Replace "`(dp,C)`" with "`(dp,c)`"

Page 223, line −5: Replace "$\sum_{k=1}^{s} a_{ijk}\mathbf{g}_k$" with "$\sum_{\ell=1}^{s} a_{ij\ell}\mathbf{g}_\ell$"

Page 223, line −4: Replace "$a_{ijk} \in R$, and $\text{LT}(a_{ijk}\mathbf{g}_k) \leq \text{LT}(S(\mathbf{g}_i, \mathbf{g}_j)$ for all i, j, k" with "$a_{ij\ell} \in R$, and $\text{LT}(a_{ij\ell}\mathbf{g}_\ell) \leq \text{LT}(S(\mathbf{g}_i, \mathbf{g}_j)$ for all i, j, ℓ"

Page 224, line 12: Replace "Exercise 1" with "Exercise 2"

Page 227, line −2: Replace "$(AG \;\; I_t - AB)$" with "$(AD \;\; I_t - AB)$".

Page 229, line 16: Replace "the t vectors" with "the s vectors"

Page 229, line 18: Replace "$1 \leq k \leq t$" with "$1 \leq k \leq s$"

Page 231, line 2: Replace "R^{n+t+s}" with "R^{m+t+s}"

Page 232, line 4 of Exercise 9: Replace "$(\mathbf{a}_1, \ldots, \mathbf{a}_s) \in R^s$ such that $\mathbf{a}_1, \ldots, \mathbf{a}_s$" with "$(a_1, \ldots, a_s) \in R^s$ such that $a_1, \ldots, a_s$"

Page 237, line -6: Replace "Hence" with "If $s > 1$, then"

Page 237, line -2: Add the sentence "If $s = 1$, then $(1 - a_1)f_1 = 0$. This implies $f_1 = 0$, which contradicts $M \neq 0$.

Page 239, line 1: Replace "matrix of $M/\mathfrak{m}M$." with "matrix of $M/\mathfrak{m}M$?"

Page 239, line 10: Replace "columns of M" with "columns of A"

Page 239, line 13: Replace "in P/IP" with "in M/IM"

Page 240, line 4: Replace "have have" with "have"

Page 242, line 14: Replace "$m \times 1$ matrix" with "$r \times 1$ matrix"

Page 242, Proposition (4.11): Replace "Q be a local ring, M a finitely generated Q-" with "R be a local ring, M a finitely generated R-"

Page 243, line -16: Replace "$M/\mathfrak{m}M$ Since" with "$M/\mathfrak{m}M$. Since"

Page 245, part c of Exercise 10: Replace "$0 = F_0(M) \subset F_1(M) \subset \cdots \subset F_{s+1} = R$" with "$0 = F_{-1}(M) \subset F_0(M) \subset \cdots \subset F_s = R$"

Page 248, line -9: Replace "*Exercise 12*" with "*Exercise 28*"

Page 253, line -6: Replace with "$M = \langle yz - xw, y^3 - x^2z, xz^2 - y^2w, z^3 - yw^2 \rangle$"

Page 254, line 1: Replace with "`M = ideal(y*z-x*w,y^3-x^2*z,x*z^2-y^2*w,z^3-y*w^2)`"

Page 260, line after second display: Replace "$\mathrm{im}(\varphi_2) = \mathrm{Syz}(G_1)$" with "$\mathrm{im}(\varphi_2) = \mathrm{Syz}(G_0) = \ker(\varphi_1)$ in F_1"

Page 260, lines 1 and 2 after second display: Replace "obtain $\varphi_i : F_i \to F_{i-1}$, where $\mathrm{im}(\varphi_i) = \mathrm{Syz}(G_{i-1})$ and $\mathcal{G}_i \subset R^{r_i}$ is a Gröbner" with "obtain $\varphi_{i+1} : F_{i+1} \to F_i$, where $\mathrm{im}(\varphi_{i+1}) = \mathrm{Syz}(G_{i-1}) = \ker(\varphi_i)$ in F_i and $\mathcal{G}_i \subset F_i = R^{r_i}$ is a reduced Gröbner"

Page 260, lines 2 and 3 above display (2.5): Replace "the leading terms of the reduced Gröbner basis $\mathcal{G}_\ell$" with "the reduced Gröbner basis $\mathcal{G}_\ell$ of $\mathrm{Syz}(G_{\ell-1}) \subset F_\ell$ is either empty or its leading terms"

Page 260, display (2.5): Add $\varphi_{\ell-1}$ above the second arrow and put a period at the end of the display.

Page 260, line after display (2.5): Replace "and the leading" with "When $\mathcal{G}_\ell = \emptyset$, $\ker(\varphi_\ell) = \{0\}$ and φ_ℓ is injective. Thus we can extend (2.5) to a free resolution of length $\ell \leq n$ by adding a zero at the left. Otherwise, the leading"

Page 260, three lines below display (2.5): Replace "$\mathrm{Syz}(G_{\ell-1})$ is a free module" with "$R^t/\ker(\varphi_\ell) \simeq \mathrm{im}(\varphi_\ell) = \ker(\varphi_{\ell-1})$ is a free module"

Page 260, four lines below display (2.5): Replace "we can extend (2.5)" should be "we can replace F_ℓ with the free module $\ker(\varphi_{\ell-1})$ and extend (2.5)"

Page 263, line 1: Replace "from (1.8)" with "from (1.7)"

Page 263, line 6: Replace "see (1.16)" with "(see (1.14))"

Page 264, Exercise 8: Add the following new part d:

d. Show that R^t/M is also a free module. Hint: Let $N \subset R^t$ be the free submodule generated by the standard basis vectors that are not leading terms of elements of $\mathcal{G}$. Use the division algorithm with respect to $\mathcal{G}$ to show that the induced map $N \to R^t/M$ is an isomorphism.

Page 265, part a of Exericse 11: Replace "of the the" with "of the"

Page 265, part b of Exercise 11, line 2: Replace "$(-1)\det(A_i)$, where A_i" with "$(-1)\det(\mathcal{A}_i)$, where $\mathcal{A}_i$"

Page 265, part d of Exercise 11, line -1: Replace "$= pB$ for some $B \in R^m$" with "$= pC$ for some $C \in R^m$"

Page 267, line 1 of **(3.3) Proposition**: Replace "be submodule" with "be a submodule"

Page 269, line 1 of Exercise 3: Replace "finitely generated" with "finitely generated graded"

Page 270, line 6: Replace with "$M = \langle yz - xw, y^3 - x^2z, xz^2 - y^2w, z^3 - yw^2 \rangle$"

Page 270, line 9: Replace with "$R(-2) \oplus R(-3)^3 \to R$"

Page 275, line 2: Replace "$F_{\ell+2} \stackrel{\varphi_{\ell+1}}{\to} F_{\ell+1}$" with "$F_{\ell+2} \stackrel{\varphi_{\ell+2}}{\to} F_{\ell+1}$"

Page 275, line 7: Replace "$+ c_2\varphi_{\ell-1}(u_m)$" with "$+ c_t\varphi_{\ell-1}(u_t)$"

Page 275, line 9: Replace "$i = 2, \ldots, m$" with "$i = 2, \ldots, t$"

Page 279, line 2 of Exercise 14: Replace "$\psi : G_\ell \to G_{\ell-1}$" with "$\psi_\ell : G_\ell \to G_{\ell-1}$"

Page 279, lines 6-7 of Exercise 14: Replace "$A_{01} = (c_2, \ldots, c_t)$ as in (3.16), and $A_{10} = (d_2, \ldots, d_m)^T$" with "$A_{10} = (c_2, \ldots, c_t)^T$ as in (3.16), and $A_{01} = (d_2, \ldots, d_m)$"

Page 279, line 10 of Exercise 14: Replace "$B_\ell = A_{00} - A_{01}A_{11}^{-1}A_{10}$" with "$B_\ell = A_{11} - A_{10}A_{00}^{-1}A_{01}$"

Page 279, line 11 of Exercise 14: Replace "What's remarkable is that this formula is identical to" with "This formula is a slight variation of the formula in"

Page 289, line 3 of Definition (4.16): "to the minimal" should be "to be the minimal"

Page 290, line 12: Replace "for S/J to" with "for R/J to"

Page 293, line 3: Replace "$\tilde{c} = p_1q_2 - p_1q_2$" with "$\tilde{c} = p_1q_2 - p_2q_1$"

Page 293, line -19: Replace "$\mathrm{GCD}(a_1, \ldots, a_m) = 1$" with "$\mathrm{GCD}(a_1, \ldots, a_m, c) = 1$"

Page 297, part a of Exercise 12, line 3: Replace "R^G" with "S^G"

Page 297, line -3: Replace "R^G" with "S^G"

Page 303, part d of Exercise 25: Replace "parts b, c and d" with "parts b and d"

Page 308, line before Exercise 4: Add a new sentence "We also regard Q as a face of itself."

Page 308, line following Exercise 4: Replace "Every face" with "Every proper face"

Page 314, line 3 of Exercise 1: Replace "You already did a special case of this in Exercise 2 of Chapter 3, §2" with "This is a special case of Exercise 2 of Chapter 3, §2"

Page 314, the last row of the matrix in display (2.4): Replace "$c_0 - x$" with "$c_0 - z$"

Page 314, part a of Exercise 2, line 4: Replace "st^2" with "s^2t"

Page 319, line 1 of Exercise 6: Replace "Then" with "Use the bracket notation introduced in Theorem (3.5) of Chapter 3, §3 to"

Page 325, display (3.9): Replace "$F(x_1, \ldots, x_n)$" with "$F(x_1, \ldots, x_N)$"

Page 325, line 1 of proof of Lemma (3.10): Replace "$m = \sum_{i=1}^n a_i e_i$" with "$m = \sum_{i=1}^n b_i e_i$"

Page 325, line 2 of Exercise 4: Replace "Exercise 3" with "Exercise 7 of §1"

Page 327, line 9: In the statement of Theorem (3.13), replace "$\mathcal{A} = \{m_1, \ldots, m_l\} \subset \mathbb{Z}^n_{\geq 0}$" with "$\mathcal{A} = \{m_1, \ldots, m_l\} \subset \mathbb{Z}^n$"

Page 328, line 11: In two places, replace "$x_0, \ldots, x_N$" with "$x_1, \ldots, x_N$"

Page 331, part d of Exercise 11, line 2: Replace "$x_1, \ldots, x_n$" with "$x_1, \ldots, x_N$"

Page 331, part d of Exercise 11, line 3: Replace "$x_1, \ldots, x_n$" with "$x_1, \ldots, x_N$"

Page 334, line −11: Replace "which is the called" with "which is called"

Page 334, line −10: Replace "If S is subset of" with "If S is a subset of"

Page 339, line 12: Replace "part b" with "part c"

Page 339, line 18: Replace "Exercise 5" with "Exercise 6"

Page 342, line 1: Replace "$\mu \cdot a_Q(\nu) \geq 0$" with "$\mu \cdot a_Q(\nu)/\|\nu\| \geq 0$"

Page 343, 7 lines below display (5.2): Replace "equivalent" with "equivalent to"

Page 352, part e of Exercise 4, line 1: Replace "$d \mapsto d/t$" with "$d \mapsto d/t^8$"

Page 359, line -7: Replace "polyedral" with "polyhedral"

Page 359, line 4 of Definition (6.4): Replace "is a face" with "is either empty or a face"

Page 365, Figure 7.9: The figure is wrong. Here is the correct figure.

Page 373, line 3: Replace "Chapter 2" with "Chapter 3"

Page 416, part b of Exercise 4, line 6: Replace "$g_3 = (2xy^2 + y^3, 0, 0, y, -y, 0, -2x - y)$" with "$g_3 = (2xy^2 + y^3, x^2y + 2xy^2 + y^3, 0, 0, y, -y, 0, -2x - y)$"

Page 417, part c of Exercise 5, last line: Replace "if $k \geq 3$" with "if $k \geq 4$"

Page 422, part d of Exercise 8: Replace "$M(\Delta', r)$" with "$M(\overline{\Delta}, r)$"

Page 423, line 7: Replace "expression (3.19)" with "expression (3.18)"

Page 425, Exercise 14, line 2: Replace "hereditary complex" with "hereditary simplicial complex"

Page 431, line −6: The left-hand side of the equation should be "$\{\underline{x^2} - y, \underline{yz} + xz - y^2\}$"

Page 433, line 1: Replace "that w" with "that $\mathbf{w}$"

Page 438, line −18: Replace "is the positive orthant" with "in the positive orthant"

Page 440, third display: Replace "$\langle \text{in}_{\mathbf{w}_{new}}(G_{old})\rangle$" with "$\langle \text{LT}_{>_{new}}(\langle \text{in}_{\mathbf{w}_{new}}(G_{old})\rangle)\rangle$"

Page 440, line −9: In two places, replace "$q_{j,g}$" with "$p_{j,g}$"

Page 444, line 10: "$\mathbf{w}_t \cdot v_1 = 6$" should be "$\mathbf{w}_t \cdot v_1 = 11$"

Page 444, line 14: "$v_2 = (0, -, -1)$" should be "$v_3 = (0, 1, -1)$"

Page 473, line −3: Replace "$\langle x_1^{n_1-1} - 1, \ldots, x_m^{n_m-1} - 1\rangle$" with "$\langle x_1^{n_1} - 1, \ldots, x_m^{n_m} - 1\rangle$"

Page 474, line 6: Replace "$\langle x_1^{n_1-1} - 1, \ldots, x_m^{n_m-1} - 1\rangle$" with "$\langle x_1^{n_1} - 1, \ldots, x_m^{n_m} - 1\rangle$"

Page 496, line 7: Replace "of elements" with "of nonzero elements"

Page 496, line −3: Replace "are verified" with "are satisfied"

Page 502, line 10: Replace "$x_1x_2^4$" with "$x_1x_2^3$"

Page 553, first column, line −14: Replace "Faugère, C." with "Faugère, J.-C."