Solutions Manual Typos

PAGE NUMBER	Exercise no.	MISPRINT→CORRECTION
1	1.2	$I \to M$
2	1.14	Insert at the beginning of the solution: By Exercise 1.87, $\mathcal{O}_F$ is an integral domain.
5	1.36	$m_\alpha(x) \to m_{\alpha,\mathbb{Q}}(x)$ (twice)
8	1.50	$= \beta(1-\zeta_p) \to = \beta(1-\zeta_p) \in \mathbb{Z}$
8	1.50	$= \gamma^{p-1} \to = \gamma^{p-1}$, since $\gamma \in \mathbb{Z}$
11	1.72	$= 0 = \to = -1 =$
11	1.72	$q_0 T_F(1-\zeta_p) = q_0 p \to q_0(T_F(1) - (-1)) = q_0 p$
13	1.88	delete: "on the preceding page" at the end of the solution.
20	-5	$\alpha^i \to \alpha\beta_i$
24–25	2.24	delete all subscripts on the "deg" notations (12 times)
25	2.24 (lines 4 and 6)	$m_{\alpha_2,F_2} \to m_{\alpha_2,\mathbb{Q}}$
25	17	$\theta_j(\alpha_i) = \to \theta(\alpha_i)$
30	3.4	of $M \mid (b) \to$ or $M \mid (b)$
31	3.12	Condition C→Condition A (twice)

My students in the Winter 2006 session of PMAT 603.49 observed that the solution of Exercise 1.70 on page 11 is inaccurate. Replace that solution with the following.

We have that

$$f(\alpha) = \alpha^d + \beta_1\alpha^{d-1} + \cdots + \beta_d = 0,$$

where $\beta_j \in \mathbb{A}$ for $j = 1, 2, \ldots, d$. Thus, by Theorem 1.51, $B = \mathbb{Z}[\beta_1, \ldots, \beta_d]$ is a finitely generated $\mathbb{Z}$-submodule of $\mathbb{A}$. Let M be the finitely generated B-submodule of $\mathbb{C}$ spanned by $1, \alpha, \ldots, \alpha^{d-1}$.

Claim: $\alpha^j \in M$ for all $j \in \mathbb{N}$.

By the displayed equation, $\alpha^d \in M$ and so it follows inductively that for any $n \geq d$, $\alpha^n \in M$ since:

$$\alpha^{n+1} = \alpha^{n+1-d}\alpha^d = \alpha^{n+1-d}(\alpha^d + \beta_1\alpha^{d-1} + \cdots + \beta_d) \in M$$

from which we have the claim.

Since $\alpha M \subseteq M$, then by Theorem 1.51, $\alpha \in \mathbb{A}$.

Don Kreher observed that there are some misleading aspects to the solution of Exercise 1.98 on page 16. Change the definition of γ to read:

$$\gamma = a + b\frac{\sigma - 1 + \sqrt{D}}{\sigma} \in \mathcal{O}_F;\ a, b \in \mathbb{Z},$$

where $\sigma = 1$ if $D \not\equiv 1 \pmod 4$ and $\sigma = 2$ otherwise.

Also, just before case 1, add the statement: "By Theorem 1.77 on pages 41–42, there are two cases to consider.

In the solution of Exercise 3.10 on page 30, the map is incorrect. It should be replaced by the map

$$\psi : F[x] \mapsto F$$

given by $f(x) \mapsto f(r)$. Then $\ker(\phi) = I$ and we have the result as cited in the last two lines of the solution to the Exercise. (Thanks go to one of my current students taking the graduate course from ANT, Collette Lemieux, for suggesting the correct mapping.)

Change "$\mathcal{G}$" to "Gal" on page 62, line 24; page 63, line 25; and on page 64, lines 2–4, 6, 23, and 25–27.