Errata for Advanced Modern Algebra, 2d Ed.

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Here are all the errata that I know. If you have found any errors not listed below, please send them to me at

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page 22 line −12 Change "$m(na) = (mn)a$" to "$n(ma) = (nma)a$"

page 32 line 16 Should read

$$H \vee K = H + K = \{h + k : h \in H, k \in K\}$$

page 36 line −19 Should read: If $(r, m) = 1$, then $[r][x] = [1]$.

page 57 line −17 Should read

Hence, $s = a^k = a^{mq}a^r$, so that $a^r = a^{-mq}s \in S$.

page 59 Exercise 1.76 Change "every GL(V)" to "GL(V)"

page 61 Change all occurrences of "1_G" and "$1_{G/H}$" to "1_{S_G}" and "$1_{S_{G/H}}$"

page 82 line −7 Delete extra "$(-1)(-a)$"

page 95 Ex.2.29(iii) Change exponent to $i+1$ in the sum. On next line, change 1 to $1_{\mathbb{C}}$.

page 106 line 15 Add "for all i and"

page 108 statement of Gauss's Lemma Change all "g, h" to "g^*, h^*"

page 126 line 2 Change "$= pa =$" to "$= a =$"

page 130 line −6 Delete:

Euclid's Lemma now gives $p \mid (a^2 + b^2)$ (or $p \mid (c^2 + d^2)$);

page 131 line −9 Change "case (i)" to "case (ii)"

page 149 line 16 Change "e_i" to "e_i'"

page 149 line −6 Change "$\sum_i$" to "$\sum_j$"

page 149 line −5 Change "w_j" to "w_i"

page 155 Exercise 2.88 Change "above" to "below"

page 160 line 17 Change "β^{n-1}" to "β^{d-1}"

page 176 line −6 Change "coefficient" to "term"

page 176 line −14 Delete "either α is transcendental over k or"

page 199 Delete footnote

page 311 line 2 Change "Corollary 5.31." to
Proposition 5.30 (for $1 - y^2 - z^2$ is not a square in $R[y, z]$).

page 341 Change second line of Exercise 5.47 to
algebraically dependent over $\mathbb{Q}$ and $\operatorname{trdeg}(E/\mathbb{Q}) = 1$.

page 342 line 8 Should read:

over k, where E/k is an algebraic extension, if $\operatorname{irr}(\alpha, k)$

page 363 footnote Should read: 1894–1921

page 369 line 6 Change (x^2, y) to (x^2, xy)

page 467 line -9 Add sentence at end:
Therefore, h is well-defined and the second square commutes.

page 479 footnote Should read: 1894–1921

page 533 line -7 Should read:

$$xy = yx + 1.$$

page 550 Ex. 7.23 Change "linear" to "irreducible"

page 704 line -5 Should read:
that is, A^p is the submodule generated by all monomials of total degree p.

page 794 Add new exercise.

(**Cartier–Weil**) If $f\colon A \to B$ and $g\colon B \to C$ are homomorphisms, prove that there is an exact sequence

$$0 \to \ker f \to \ker(gf) \to \ker g \to \operatorname{coker} f \to \operatorname{coker}(gf) \to \operatorname{coker} g \to 0.$$

Hint. There is a commutative diagram with exact rows

$$\begin{array}{ccccccccc} 0 & \longrightarrow & A & \longrightarrow & A \oplus B & \longrightarrow & B & \longrightarrow & 0 \\ & & \downarrow{\scriptstyle f} & & \downarrow{\scriptstyle h} & & \downarrow{\scriptstyle g} & & \\ 0 & \longrightarrow & B & \longrightarrow & B \oplus C & \longrightarrow & C & \longrightarrow & 0; \end{array}$$

the maps in the rows are the usual injections and projections of direct sums, while $h(a, b) = (fa - b, gb)$. The Snake Lemma gives exactness of

$$0 \to \ker f \to \ker h \to \ker g \to \operatorname{coker} f \to \operatorname{coker} h \to \operatorname{coker} g \to 0,$$

and it is easy to see that $\ker h \cong \ker(gf)$ and $\operatorname{coker} h \cong \operatorname{coker}(gf)$.

page 910 lines -5 to -3 Replace "Suppose ... $S = \{u^n : n \geq 1\}$ is" by
If $u \notin \operatorname{nil}(R)$, then $u^n \neq 0$ for all $n \geq 1$ and the subset $S = \{u^n : n \geq 1\}$ is

At end of proof, on page 911, write: Therefore, $u \notin \bigcap_{\mathfrak{p}=G\text{-ideal}} \mathfrak{p}$.

page 911 lines 16, 17 Replace "$u \in \operatorname{Frac}(R/I)$" by "$u \in R/I$"

page 913 line 5 Replace "$J(R)$" by "$J(R/I)$"

page 913 line 11 Change hypothesis:

"*A domain R is a Jacobson ring ...*"

page 913 line 18 Replace "$v \in K$" by "$v \in R[u]$"

page 914 line 5 Replace "Theorem 5.98" by "Theorem 10.77"

page 914 line −6 In statement of Theorem 10.79, change

$\mathrm{Id}(\mathrm{Var}(I)) = \sqrt{I}$ to $\mathrm{Id}(\mathrm{Var}(I)) \subseteq \sqrt{I}$

page 977 line −19 Insert "="

$$\mathrm{pd}(R/Ra) = \mathrm{pd}(Ra) + 1 =$$

page 1006 Insert new index entry: Snake Lemma 792