

CORRECTIONS TO J-P. SERRE'S BOOKS

Abelian ℓ -adic Representations and Elliptic Curves (second edition, AK Peters, 1988)

- p.I-26, line 3. Replace " $L_m(s - m/2)$ " by " $L_m(s + m/2)$ ".
- p.III-10, line 3. Replace "chap. II, 1.1" by "chap.II, 2.1".
- p.III-10. The Proposition should be labelled "Proposition 1".
- p.III-13, line 3. Replace "chap.II, 2.2" by "chap.II, 2.3".
- p.III-15, line 3. Replace "2.4" by "2.5".
- p.III-15, line -5,6. Replace "proposition" by "theorem".
- p.III-15, line -1. Replace "Remark 1" by "Remark 2".
- p.III-29, line 3. Replace "Here $K^* = (K \otimes R)^*$ " by "Here $K_\infty^* = (K \otimes R)^*$ ".
- p.III-39, line 1. Replace "Proposition 3" by "Proposition 4".
- p.III-39, line 6. Replace A1 by A2.
- p.III-41, line -5. Replace "Proposition 4" by "Proposition 5".
- p.III-48, line 3. Replace "Proposition 5" by "Proposition 6".
- p.III-49, line -3. Replace "Proposition 6" by "Proposition 7".
- p.III-50, lines 10-11. Replace "Prop.5" by "Prop.6" and replace "Prop.6" by "Prop.7".
- p.III-52, line 2 of th.3. Replace " G^{al} " by " G^{ab} ".
- p.III-53, line -1. Replace "Prop.6" by "Prop.7".
- p.IV-8, line 5. Replace " $u^{12}\Delta$ " by " $u_v^{12}\Delta$ ".
- p.IV-17, line -11. Replace "section 4" by "section 2.2".
- p.IV-19, part (c) of Main Lemma. Replace " G_ℓ " by " \tilde{G}_ℓ ".
- p.B-7. Reference [80]. Add "(=Oe.136)".

Algebraic Groups and Class Fields (Springer-Verlag, 1988)

- Contents, Chapter VI , §34. Replace "Map" by "Application".
- p.17, line -2. Replace "ample" by "very ample".
- p.18, line -8. Replace varieities by varieties.
- p.36, line 4. Replace $N_Q f$ by Nf .
- p.36, line 6. After "with g ", add "; here Nf means $N_{L/K} f$."
- p.36, line -9. In the displayed formula, replace $>$ by $<$.

- p.108, line -2. Replace Châtalet by Châtelet.
- p.117. The title of §2.7 of Chap.VI should be “Review of definitions about coverings”.
- p.122, Proposition 11. Replace an isogeny by a separable isogeny.
- p.124, Corollary. Replace isogenies by separable isogenies.
- p.154, line 9. Replace non-published by unpublished.
- p.157. The title of §34 should be “Application to the cycle class group”.
- p.158, line 5. Replace Frobeniuis by Frobenius.
- p.199, [27]. Replace “Tohoku” by “Tôhoku”.
- p.202, [86]. Replace *finis* by *fini*.
- p.202, [90]. Replace algébre by algèbre.

Local Fields (Springer-Verlag, third printing, 1979)

- p.14, line 18. Replace $\mathfrak{p}B = \prod_{\mathfrak{p}|\mathfrak{p}} \mathfrak{P}^{e_{\mathfrak{p}}}$ by $\mathfrak{p}B = \prod_{\mathfrak{p}|\mathfrak{p}} \mathfrak{P}^{e_{\mathfrak{p}}}$.
- p.15, last line. Replace $N : I_A \rightarrow I_B$ by $N : I_B \rightarrow I_A$.
- p.31, line 3. Replace K by \hat{K} .
- p.63, last line of prop.3. Replace $e_{L/K}$ by $e_{L/K'}$.
- p.63, fifth line of proof of prop.3. Replace *st* by *st*.
- p.74, line -7. Replace twice ϕ by φ .
- p.75, Lemma 5. Replace ϕ by φ .

Galois Cohomology (Springer-Verlag, corrected second printing 2002)

- p.vii. The title of §1.5 should be Free pro- p -groups.
- p.7, line -5. Same correction as above.
- p.15, line 14. Replace $M' \in C_K$ by $M' \in C'_K$.
- p.36, line 15. Replace idèle classes by ideal classes.
- p.49, line 7. Replace (A', A'') -principal by (A, A'') -principal.
- p.129, line -1. Replace prop.36 by prop.37.
- p.134, last line of exerc.3. Replace “if the field k is (C_1) ” by “if the field k has the following property :
 (C'_1) Every finite family f_1, \dots, f_m of homogeneous polynomials in $k[x_1, \dots, x_n]$, of degrees d_1, \dots, d_m with $\sum d_i < n$, has a non trivial zero in k^n .”
 Note that (C'_1) implies (C_1) . Whether the converse is true seems to be an open question.
- p.194, line 20. Replace a SDNB by an SDNB .

Lie Algebras and Lie Groups (Springer-Verlag, LN 1000, corrected fifth printing, 2006)

p.23, line 16. Replace $H^2 = \{x, y\}$ by $H^2 = \{xy\}$.
 p.120, exerc. 2 b). In the denominator of the formula, $(i + j - k)$ should be $(i + j - k)!$.

Complex Semisimple Lie Algebras (Springer-Verlag, 1987)

p.ii. In the title of the book, replace algebras by algebras.
 p.iv, middle of page. Add the page number of the Bibliography, which is 72.
 p.4, line -1. Replace This implication by The implication.
 p.22, line -15. Add a closed parenthesis) after algebra".
 p.49, line 19. Replace shows by means.
 p.52, line -6. Add a reference to Chevalley's note "Sur la classification des algèbres de Lie simples et de leur représentations" (CRAS 227 (1948), 1136-1138), where the relations $(\theta_{ij}), (\theta_{ij}^-)$ are defined, and are used to prove results analogous to those given in the text (but somewhat weaker). Similar results were obtained slightly later by Harish-Chandra in his paper "On some applications of the universal enveloping algebra of a semisimple Lie algebra", TAMS 70 (1951), 28-96. These θ -relations should thus be called "Chevalley relations" or "Chevalley-Harish-Chandra relations" - but not "Serre relations", as some people do.
 p.54, line -1. Replace \mathfrak{g} by \mathfrak{g}^α .
 p.61, line 10. Replace E'_1 by E'_i .
 p.68, line 9. Replace g by \mathfrak{g} .
 p.68, line 17. Replace $\gamma \in P$ by $\gamma \in P_1$.

Local Algebra (Springer-Verlag, 2000)

p.9. Rewrite the Corollary to Proposition 8 as follows :
 Let $\mathfrak{p} \in \text{Spec}(A)$. Suppose $M \neq 0$. The following are equivalent :
 (1) $\text{Ass } M = \{\mathfrak{p}\}$.
 (2) x_M is nilpotent for every $x \in \mathfrak{p}$ and is injective for every $x \notin \mathfrak{p}$.
 p.92, line 3. Replace M if by M is.

A Course in Arithmetic (Springer-Verlag, corrected third printing, 1996)

p.83, line -13. Replace this line by : $\geq m^2 - |mn| + n^2 = |m\rho \pm n|^2$.
 p.91, Proposition 7. Add (Euler) after Proposition 7.

p.112, lines 7,8. Replace by : “G. Lejeune-Dirichlet - Beweis eines Satzes über die arithmetische Progression, 1837, *Werke* I, 307-312.

Trees (Springer-Verlag, corrected second printing, 2003)

p.19, line 6 (without counting the picture). The sentence “ The subtree generated by a set of vertices ” should be in italics (it is a subtitle).

p.63, line 7. Replace $m + 2s$ by $m + 2d$.

p.65, line -2. Replace prop.26 by prop.25.

p.68, line 12. The reference to Tits Comptes rendus note should be : “Systèmes générateurs de groupes de congruence”, CRAS 283 (1976), 693-695 = Collected Works vol.III, [100].

p.84, line 5. Replace (twice) L_V by L_v .

p.89, line -14. Replace $\mu = (G/\Gamma^0)$ by $\mu(G/\Gamma^0)$.

p.112, line -10. Replace *apartment* by *sector*.

Lectures on the Mordell-Weil theorem (Vieweg, third edition, 1997)

p.67, exercise. Remove item e).

p.148, line 5. Remove the word “normal” in “closed normal subgroup H ”.

p.151, line 5. Replace “weakend” by “weakened”.

p.162, Questions 1) and 2). An elliptic curve over \mathbf{Q} of rank ≥ 28 has been constructed by N. Elkies in 2006. Over $\mathbf{Q}(\mathbf{T})$ (with non constant j invariant), the record is ≥ 18 , and it is also due to Elkies. See e.g. Elkies paper arXiv : 0709.2908.

p.162, line 12. No cap. in “variation”.

p.192, Table of the 13 values of j ... In the case $d = -3, f = 3$, the value of j is $2^{15}3.5^3$, and not $-2^{15}3.5^3$.

p.205, reference [12]. Replace “groupes” by “groupe”.

p.207, reference [Se1]. Replace “Quelque” by “Quelques”.

p.207, reference [Se2]. Replace “groups” by “groupes”.

Collected Works I (Springer Verlag, second printing, 2003)

p.vii. Add to the list of Academies : Russia (2003), Norway (2009), Taiwan (2010), Torino (2010).

Add to the list of doctorates : Oslo (2002), Oxford (2003), Bucharest (2004), Barcelona (2004), Madrid (2006), McGill (2008), TsingHua (2017).

In “Cours dans des universités étrangères”, add the year 2007 to the Harvard list, and also : E.P.F.L. Lausanne (2011), Hsinchu (2009, 2011, 2013), Pohang (2011).

p.xix. The list of “textes non reproduits dans les Oeuvres” should be enlarged, by mentioning the following books :

- (with P. Colmez) “Grothendieck-Serre Correspondence” (bilingual edition) ;
- “Cohomological invariants, Witt invariants and trace forms” ;
- “Exposés de Séminaires (1950-1999)” ;
- “Lectures on $N_X(p)$ ” ;
- (with P. Colmez) “Correspondance Serre-Tate” ;
- “Finite Groups : An Introduction”.

It should also mention the following papers :

L’histoire de la “modularity conjecture”, SMF Gazette 91 (2002), 55-57.
 (with M. Rost and J-P. Tignol) La forme trace d’une algèbre simple centrale de degré 4, CRAS 342 (2006), 83-87.

(with V. Chernousov) Estimating essential dimensions via orthogonal representations, J. Algebra 305 (2006), 1055-1070

Bounds for the orders of the finite subgroups of $G(k)$, in *Group Representation Theory* (M. Geck, D. Testerman & J Thévenaz, edit.), EPFL Press, 2007, 405-450.

Three letters to Walter Feit on group representations and quaternions, J. Algebra 319 (2008), 549-557.

How to use finite fields for problems concerning infinite fields, Contemp. Math. 487, AMS (2009), 183-193.

La vie et l’oeuvre scientifique d’Henri Cartan, Gazette des mathématiciens 121 (2009), 65-70.

A Minkowski-style bound for the order of the finite subgroups of the Cremona group of rank 2 over an arbitrary field, Moscow math. J. 9 (2009), 183-198.

(with J-L. Nicolas) Formes modulaires modulo 2, CRAS 350 (2012), 343-348 and 449-454.

(with E. Bayer-Fluckiger & R. Parimala) Hasse principle for G -trace forms, Izv. Math. 77 (2013), 5-28.

Un critère d’indépendance pour une famille de représentations ℓ -adiques, Comment. Math. Helv. 88 (2013), 541-554.

Bases normales autoduales et groupes unitaires en caractéristique 2, Transf. Groups 19 (2014), 643-698.

On the mod p reduction of orthogonal representations, in *Lie Groups, Geometry, and Representation Theory - a tribute to the life and work of Bertram Kostant* (V.G. Kac & V.L. Popov edit.), Birkhäuser (2018), 527-540.

p.xxii. Add to the list of the Bourbaki seminars :
 Complète Réductibilité, 2003/2004, n°**932**, 23 p.
 Le groupe de Cremona et ses sous-groupes finis, 2008/2009, n°**1000**, 26 p.
 Distribution asymptotique des valeurs propres des endomorphismes de Frobenius [d'après Abel, Chebyshev, Robinson,...], 2017/2018, n°**1146**, 43 p.

p.xxiii. Add a subsection named *Oberwolfach Reports* :
 On the values of the characters of compact Lie groups, 2004, 666-667.
 BL-bases and unitary groups in characteristic 2, 2005, 37-40.
 Coordonnées de Kac, 2006, 1787-1790.
 Le groupe quaquaversal, vu comme groupe S-arithmétique, 2009, 1421-1422.
 Some aspects of the Sato-Tate conjecture, 2011,
 Cohomological invariants mod 2 of Weyl groups, 2018.

p.594, lines 8-9. “on ignore si V est toujours simplement connexe”. This has been settled (positively) by J. Kollár, cf. Bourbaki seminar 905 (June 2002), cor. 3.6.

Collected Works II (Springer Verlag, second printing, 2003)

p.3, line 6. Add “compactes ” before “connexes ” .
 p.467, line 14. Add an arrow \rightarrow in the formula. It should be $\varphi_2 : \Gamma_q(2) \rightarrow C$.
 p.508, line -6. Replace X^n by x^n .
 p.714, line 5. Replace 1964 by 1974 in the reference to Deligne’s paper.

Collected Works III (Springer Verlag, second printing, 2003)

p.265, line -13. Replace asymptotique by asymptotique.
 p.449, line 2. In formula (6), replace \sum by \prod .
 p.538, footnote. It seems that Brylinski’s proof needs some repair ; see J-L. Colliot-Thélène, Expo. Math. 23 (2005), 161-170.

Collected Works IV (Springer Verlag, second printing, 2003)

p.358, line -4. Replace facon by façon.
 p.389, line 8. Replace symétriqu by symétrique.
 p.389, line -9. Delete the middle parenthesis in $(\mathbf{F})_2)^r$.
 p.400, line -13. Replace certaine by certains.
 p.406, line -4. Replace 8.5.4 by 6.5.4.
 p.414, line 8. Replace $x, y \in V$ by $x \in P, y \in V$.
 p.446, line -7. Replace K_x by F_x .

p.527. About the canonical structures of the supersingular elliptic curves, see the comments given in *Correspondance Serre-Tate*, vol.II, p.727.
 p.566, formula (104). Replace T by T' .
 p.568, line 2. Replace formule (13) by prop.4.
 p.676, line 14. Replace Il reste à traiter le cas 2-adique by :
 Le cas $p = 2$ a été traité onze ans plus tard par les mêmes auteurs : Ann. Math. **172** (2010), 1391-1405.

Linear Representations of Finite Groups (Springer-Verlag, corrected third printing, 1986)

p.11, line 10. Add a period after class function.
 P.15, line 6. Replace χ by ψ .
 p.33, line -18. Delete the letter s at the end of representations.
 p.43. Exercises 5.4 and 5.5 should be labelled 5.5 and 5.6.
 p.50, last line of prop.12. Replace $\tilde{\rho}(u)$ by $\tilde{\rho}_i(u)$.
 p.63, line 18. Replace $W = \bigoplus_{\chi \in X} W$ by $W = \bigoplus_{\chi \in X} W_{\chi}$.
 p.76, line -1. Delete the extra parenthesis) after the first term.
 p.86, line -1. In the formula $P_{M,c_2} = P_{M,c_2}$, replace the first c_2 by c_1 .
 p.105, line 11. Replace reresentation by representation.
 p.106, line -7. Replace C by \mathbf{C} .
 p.110, line 4. Delete the parentheses around $\text{Cent}.R[G]$.
 p.110, line -3. Replace ex.12.9 by ex.13.9.
 p.125, line 11. Replace 15.1 by 15.2.
 p.125, line -5. Replace By (a) by By the first case.
 p.132, line 11. Replace $R_A(G)$ by $P_A(G)$ and replace $R_k(G)$ by $P_k(G)$.
 p.134, line 10. Replace $P_K^+(G)$ by $P_k^+(G)$.
 p.136, part (c) of Proposition 46. Replace $A[G]$ by $k[G]$.
 p.142, line -11. In the bottom line of the diagram, replace $P_k(G)$ by $R_k(G)$.
 p.143, line 13. Replace $R_{k'}(G)$ by $R_{K'}(G)$.
 p.143, line -9. Replace r_p by r_P .
 p.145, line -8. Add a parenthesis) after $b \in F$; delete the parenthesis) after of E .
 p.149, line 9. Replace $R_G(G)$ by $R_K(G)$.
 p.159, line -8. Replace ν_F by a_G .
 p.162, line -7. In the formula, replace $i \geq \ell$ by $i \geq 1$.
 p.163, line -1. Permute E and E' .

p.164, line -10. The letter Z should be in boldface : **Z**.

p.168, line 8. Replace $F_{C(G):9.1}$ by $F_{C(G)} : 9.1$.

Exposés de Séminaires 1950-1999 (deuxième édition, augmentée, SMF, 2008)

p.136, line -6. Replace “ne s’étend par” by “ne s’étend pas”.

p.146, line -8. Replace “mas” by “mais”.

p.253, line 10. Replace “fixed point of G ” by “fixed point of g ” .

Cohomological invariants, Witt invariants, and trace forms (p.1-100 of AMS ULS28, 2004)

p.46, line -8. Replace “Choose α ” by “Choose $\alpha \neq 0$ ”.

p.60, Lemma 25.12. Replace $n \equiv i \pmod{2}$ by $n \not\equiv i \pmod{2}$, and vice-versa.

p.62, Theorem 26.3 (1). Replace “is 0” by “is negligible”.

p.70, line 7. Replace “Th.27.14” by “Th.27.15”.

p.78, line -15. Add “with $A, B, A^2 - B \neq 0$ ” after “ $\langle A, A^2 - B, (AB(A^2 - B)) \rangle$ ”.

Grothendieck-Serre Correspondence (Bilingual edition, SMF-AMS, 2004)

p.137. In conditions C_n and C'_n , replace “ i ” by “ q ”.

p.168, line -10, French side. Replace “où il est ” by “où 11 est ”.

p.239. Replace the date of the letter by “1.15.1964” (this mistake was pointed out by R. Steinberg).

p.288, English side. Replace the first two lines by : “Representations over **Z**, 235-238”.

Lectures on $N_X(p)$ (CRC Press, 2012)

[Many of these corrections were communicated to me by Francesc Fité.]

p.16, line 13. Replace Σ_K by V_K .

p.18, line 15. Replace Exerc.2 by Exerc.1.

p.19, line -3. In the second term of the formula, add the letter m in front of t^{m-1} , as in the first term.

p.21, line 14. Replace When is the by In that .

p.25, line 1. Replace §3.3.3.3 by §3.3.3.4.

- p.25, line -1. Replace §3.3.2.2 by §3.3.3.2.
- p.35, line -3. Replace th.4.5 by th.4.6.
- p.36, line -7. Replace cf. [Se 84, p.81] by cf. §4.6.2.
- p.46, line 18. Replace $\Psi^{k+k'}$ by $\Psi^{kk'}$.
- p.57, line 21. Replace 5.2.1. Densities by 5.2.2. Densities.
- p.58, line -8. Replace 5.2.2 by 5.2.3.
- p.60, line -4. Replace twice Aut by Out .
- p.68, line 8. Replace §3.3.2.2 by §3.3.3.2.
- p.68, line 10. Replace §3.3.2.2 by §3.3.3.2.
- p.68, line 13. Replace §3.3.2.3 by §3.3.3.3.
- p.69, line 1. Replace This shows that by Hence.
After the image , add $(g_{p,i,n})$. The modified line should then be :
Hence $N_X(p)$ mod ℓ^n depends only on the image $(g_{p,i,n})$ of g_p in the
- p.69, line 2. Replace §3.3.2 by §3.3.3.
- p.70, line 5. Replace §3.3.2.2 by §3.3.2.
- p.70, line 7. Replace th.6.2 by th.6.3.
- p.71, line 20. Replace th.6.2 a) by th.6.3.
- p.71, line 22. Replace §3.3.2.1 by §3.3.2. Replace th.6.2 d) by th.6.3 d).
- p.71, line 27. Replace th.6.15 by th.6.17.
- p.80, line 18. Replace §6.1.2 by §6.2.1.
- p.86, lines 16, 18, 20, 24. In each of these four lines there occurs a minus sign which should be replaced by a boldface minus sign “ **−** ”, similar to the one which appears on line 21.
- p.86, line -2. Replace is smooth by is proper and smooth.
- p.92, lines 3, 5, 17. Replace (three times) $N_p(X)$ by $N_X(p)$.
- p.98, line 7. Replace Proposition 7.9 by Proposition 7.10.
- p.119, line 15. Replace Proof of 8.1.4.2 by Proof of 8.1.4.1.
- p.119, line 17. Replace the minus sign by a boldface minus sign “ **−** ”.
- p.119, line 21. Replace uppe by upper.
- p.121, line -11. Replace X by X_1 .
- p.121, line -10. Replace Y by X_2 .
- p.121, line -5. Replace §8.5.4 by §8.5.5.
- p.121, line -1. The letter Q in Γ_Q should be boldface.
- p.122, line 1. The letter Q in Γ_Q should be boldface.
- p.122, line 4. Replace G by G_X .
- p.123, line -9. Insert a blank space before Other axioms.
- p.124, line 16. Replace totaly by totally.
- p.129, line -1. Replace [SS 12] by [Sa 12].

- p.133, line 13. Replace Corollary 7.1.3 by Corollary 7.13.
- p.134, line 2. Add a dot after cf .
- p.136, line 9. Replace there exists $t \in$ by there exists $t' \in$.
- p.140, line -9. Replace §9.4.3 by §9.4.2.
- p.141, line 7. Replace It will be then by It will then.
- p.141, line 11. Replace restrited by restricted.
- p.141, line 20. The letter A is lacking in front of the formula. The left side of it should be $A_T^1(f, x) =$.
- p.142, line 4. Replace φ by ψ .
- p.143, line -1. Delete the vertical bar on the left, just after $\frac{1}{|G|}$. The formula should be $\frac{1}{|G|} \sum_{g \in G} \dots$
- p.149, reference [EJ 10]. Replace arXiv : 1006.0721 by Geom. Dedicata 159 (2012), 29-40.
- p.149, reference [FKRS 11]. Replace in preparation by Compos. Math.148 (2012), 1390-1442.
- p.151, reference [KP 99]. Replace Jaczorowki by Jaczowski .
- p.152, reference [SS 12]. Replace by :
[Sa 12] T. Saito, *The discriminant and the determinant of a hypersurface of even dimension*, Math. Research Letters 12 (2012), 855-871.
- p.159, line -5. Replace 3.3.2 by 3.3.3.
- p.161, line 9. Replace 3.3.3.2 by 3.4.1.2.
- p.162, line -1. Replace 3.3.2 by 3.3.3.2.

Finite Groups - an Introduction (International Press, 2016)

Corrections taken from the home page of Bjorn Poonen.

Besides B. Poonen and myself, the following people have contributed to this list : Anlong Chua, Peter Mizes, Timothy Ngotiaoco, Ahaan Rungta, Adam Theriault-Shay, Chase Vogeli.

- p.2, lines 4-5. Definition 1.5 : faithful, free, torsor should be boldface (not just their first letters).
- p.2, line 27. Replace “We have” (before (1.2)) by “By (1.1), we have” .
- p.10, exerc.5. Replace $(H : H') = 3$ by $(H : H') = 2$.
- p.10, exerc.7(a). Replace x/h by h/x .
- p.11, exerc.11(i). Replace “ $gx_i = y_i$ for $i = 1, 2$ ” by “ $gx_1 = x_2$ and $gy_1 = y_2$ ” .
- p.13, exerc.21. In the final sentence, replace \mathcal{S}_q by C_q (cyclic group of order q).

- p.18, proof of prop.2.11(2). Replace $(G : H)$ by $(G : S)$.
- p.19, line 7. Replace H by S in the first sentence of §2.4.
- p.24, exerc.3(b), middle of the Hint. Replace “ordre” by “order”.
- p.25, exerc.7(b). The last displayed line should be

$$x_m \mapsto x_m + a_m(x_1, \dots, x_{m-1}),$$

with m instead of n each time it occurs.

- p.25, exerc.8(b). Replace “The of G ” by “The conjugation action of G ”.
- p.26, exerc.9. Rewrite that exercise as follows :
Let J be the set of 5-Sylow subgroups of \mathcal{S}_5 . We have $|J| = 6$.
 - a) Use the action of \mathcal{S}_5 on J to show that \mathcal{S}_5 is isomorphic to a transitive subgroup H of \mathcal{S}_6 .
 - b) Use the action of \mathcal{S}_6 on \mathcal{S}_6/H to define an automorphism of \mathcal{S}_6 which is not inner¹.
- p.26, footnote 3. Replace the letters c, s by x, y , in order to avoid a conflict with the use of “ c ” in exerc. 15(a).
- p.27, exerc.15(b), line 2. Delete one of the two commas after c .
- p.27, exerc.15(e). In the Hint, replace twice a_1 by a_0 .
- p.27, exerc.2.16(b). Replace $q \equiv 3 \pmod{16}$ by $q \equiv \pm 3 \pmod{8}$.
- p.28, line 3. Replace “prop.2.4” by “cor.2.15”.
- p.30, line 5. Replace $|K| \leq 3$ by $|K| = 2$.
- p.31, Corollary 3.3. Rewrite the proof of(i) as follows :
Choose an abelian subgroup A of G having property (3) of prop.3.2, and take for N the set of $a \in A$ with $a^p = 1$, where p is a prime divisor of $|A|$.
- p.32, th.3.18 (3). Remove the word “proper”.
- p.32, line -8. Replace “condition (2)” by “condition (2)’”.
- p.38. Rewrite the proof of th.3.18 as follows :
Proof. (1) follows from the fact that G is nilpotent, cf. cor.3.12; it implies (2). For (3), it is enough to prove the existence of H_2 with $H \subset H_2 \subset G$ and $(G_2 : H) = p$. To do so, use induction on $|G|$. If $N_G(H) \neq G$, apply the induction assumption to $N_G(H)$. If $N_G(H) = G$, choose a subgroup of G/H of order p and take for H_2 its inverse image in G .
- p.38, th.3.20 (5). Replace “Two elements” by “Any two elements”.
- p.39, line -2. Replace “cor.3.18” by “part (3) of th.3.18”.
- p.42, proof of th.3.23. Replace (12 times) “ $i(g)$ ” by “ $i(s)$ ”.
- p.43, proof of th.3.27. Replace “the theorem above” by “th.3.26”.
- p.44, line 4. Replace “assume” by “Assume now”.

- p.44, line 11, proof of prop.3.29. Replace $t(g)e(g)t(g')e(g') = t(gg').e(g)e(g')$ by $g.e(g)g'.e(g') = gg'.e(gg')$.
- p.46. Remove exerc.1, since it has already been done in cor.3.3 (ii).
- p.46, exerc.2 (iii). Replace “exists” by “exist”.
- p.47, lines 1 and 2. Replace “ x, y ” by “ u, v ”.
- p.47, line 5. Replace “ b_1 ” by “ b_2 ”.
- p.47, line 7 of exerc. 7. Replace “ $\lambda \in k$ ” by “ $\lambda \in K$ ”.
- p.47, line 8 of exerc. 7. Replace “of U ; this proves a). As for e)” by “of \tilde{U} ; this proves e). As for a)” .
- p.47, exerc. 8 a). Delete the hypothesis that the A_i/A_{i+1} are abelian. Add : [Hint : Let $g \in G_n$. Show that g acts on A_i/A_{i+n+1} by $x \mapsto xz$, for some $z \in A_{i+n}/A_{i+n+1}$. If $h \in G_1$, show that hgh^{-1} acts on A_i/A_{i+n+1} by $x \mapsto xh(z)$. Since h acts trivially on A_{i+n}/A_{i+n+1} , conclude that $g^{-1} \cdot hgh^{-1}$ acts trivially on A_i/A_{i+n+1} , hence belongs to G_{n+1} .]
- p.59, line 5 of §4.5.1. Replace “composition” by “composition”.
- p.59, line 4 of §4.5.2. Replace $\text{Out}(G)$ by $\text{Out}(A)$, and $\text{Aut}(G)$ by $\text{Aut}(A)$.
- p.59, th.4.16. Replace “is and only if” by “if and only if”.
- p.60, formula (4.10). Replace “ $e \bullet_f e'$ ” by “ $e *_f e'$ ”.
- p.61, lines 2-4 of the proof of th.4.20, part II. After “ $E = A.E'$.”, add “Hence the homomorphism $E' \rightarrow G$ is surjective; its kernel A' is equal to $E' \cap A$ and we have the exact sequence $1 \rightarrow A' \rightarrow E' \rightarrow G \rightarrow 1$.”
- p.62, proof of th.4.20, part III, lines 3-4. Replace “Let p ... its inverse image” by : “We may assume that $G \neq 1$. Then, by cor.3.3(i), G has a nontrivial abelian normal p -subgroup I for some prime p . Let \tilde{I} be its inverse image”.
- p.62, proof of th.4.20, part III, line 7. Replace “ I_1 by aI_1a^{-1} ” by “ G_1 by aG_1a^{-1} ”.
- p.62, proof of th.4.20, part III, line 10. After “ G_1 and G_2 are conjugate”, add “by an element of $A \cap N$ ”.
- p.65, exerc.2(b). The identity should be “ $\partial_i \partial_j F = \partial_j \partial_{i-1} F$ if $i > j$ ”.
- p.66, exerc.5, case (ii) : Replace “agument” by “argument”, “same image” by “same images”, and “than” by “as”.
- p.66, exerc.7(b), Hint. Replace H by A .
- p.67, exerc.8. Replace $(1, z)$ by $(1, nz)$.
- p.67, exerc.8(a). Replace (g, z) by $(g, 0)$.
- p.69, exerc.16(c), Hint. Replace “prop.4.22” by “cor.4.22”.
- p.71, just before th.5.4. Replace “ th.8.21” by “th.8.62”.

p.73, proof of th.5.9. In the sentence after the display, replace “th.4.6” by “th.4.20(1)”.

p.74, proof of prop.5.11(1). Replace p -Sylow by π -Sylow.

p.75, proof of th.5.13. Replace “lemma 5.8” by “cor.5.8”.

p.79, th.6.6. In (1’), “after “such that”, replace “ $\mathfrak{q}O_K$ is the p -th power of an ideal of O_K ” by “ p divides the residue field degree $[O_K/\mathfrak{q}_K : O_k/\mathfrak{q}]$ for every prime ideal \mathfrak{q}_K of O_K lying above \mathfrak{q} .”

p.84, proof of th.6.13 (1) \Rightarrow (2). Replace “If p a prime factor...” by “If p is a prime factor...”.

p.85, comment after the proof of cor.6.14. Replace “property 6.14” by “property \mathcal{F} ”.

p.86, exerc.3. Add “, except 18, ” after “in this list”. Rewrite the next sentence as “Show that there are two non isomorphic Frobenius groups of order 18; same question for the orders 42 and 48.”

p.86, exerc.4. Replace “as” by “has”.

p.94, proof of prop.7.18. On the first line, add “of minimal order” after “odd order $N < 2000$ ”. On the sixth line, replace “number” by “numbers”.

p.96, lines 16 and 22. Replace P by \mathbf{P} .

p.96, line 18. Replace “th.7.15” by “Th.7.15”.

p.96, line 27. Replace “ $w(2\lambda) = 4\lambda$ ” by “ $w(2\lambda) = 4$ ”, and replace “ $w(4\lambda) = 2\lambda$ ” by “ $w(4\lambda) = 2$ ”.

p.101, exerc.9(b), Hint. Replace “transfert” by “transfer”.

p.102, exerc.17 b). Delete the sentence “Hence the action of B/U on $\mathbf{P} - \{\infty\}$ is faithful.”

p.102, exerc.17 d). Replace the second sentence by “ Use th.7.5 to prove the existence of $w \in G$ such that $t.wtw^{-1} \in D(B) = U$; by replacing w by uw with a suitable $u \in U$, show that one can achieve $t.wtw^{-1} = 1$.”

p.132, exerc.6(c). Replace by “Construct an example of b) such that G acts transitively both on X and on Y ”.

p.142. Remove the stray symbols +.. after th.9.1.

p.144, second sentence of §9.1.3. Replace “if x in a non-zero integer” by “if x is a non-zero integer”.

p.152, §9.2.7, complement 2. Delete “the” in “the Lefschetz’s principle” .

p.152, §9.2.7, end of complement 2. Add : “ See also M.J. Larsen & R. Pink, Finite subgroups of algebraic groups, *J. Amer. Math. Soc.* **24** (2011), 1105-1158.”

p.154, line -6. Replace “wigth” by “with”.

p.164, line -2. Replace “J.W.C. Cassels” by “J.W.S. Cassels”.

J-P. Serre, March 2020