

TYPOS IN THE NEW PRINTING OF MUMFORD'S "ABELIAN VARIETIES"

Below is a list of typographical errors which I found. I include punctuation errors which were introduced, but I do not attempt to list all of the original punctuation errors (misplaced commas, etc.) The page numbering and line numbering below refers to the new version of the book, not the older version from which it was created. A general comment is that there are quite a few unpleasant-looking line-breaks through mathematical expressions in the new version, but I won't comment on those below.

Also, there was a huge number of asterisks placed in the line of text which should have been superscripts or subscripts. I tried to find all of the mistakes with placement of asterisks, but I may have missed some; they were so frequent that perhaps all need to be double-checked (not sure by whom).

Feel free to consult with a local expert to confirm any suggested changes below.

page viii: On line 20, "section of line bundle" should be "sections of a line bundle"

In the Table of Contents, the Chapter headers should have periods after the Roman numerals (it looks especially bad for Chapters III and IV), as in the original version. Note also that the title of Chapter IV has the wrong font for the first letter: it should be "Hom" rather than "**H**om". Also, sections 13 and 14 have the wrong titles; compare with the actual sections in the text. For consistency with the title of section 6, in the title for section 10 "cube (II)" should be replaced with "cube: II." The same correction should be made in the actual section 10 header on page 85 (this was a typo in the original version).

page 1:

line 7: replace "every" with "*every*" (as in the original)

line -4: replace 1_v with 1_V (as in the original)

page 5:

line 8: replace $\Gamma(X, C)$ with $\Gamma(X, \mathcal{C})$.

line 15: A new paragraph should begin at this line ("Our aim is now ..."), as in the original.

page 9: In the big displayed expression in the middle of the page, the labels "first isom." and "second isom." are very poorly placed on the page. Compare with the original to see how it should look. Note also that the target of the map β is very poorly placed on the page; again, compare with the original to see the right thing to do. Please do not poorly place "third isom." when making this correction.

page 10: In the second rectangular diagram, the upper and lower leftmost horizontal arrows are wrong. There should be little hooks on the left ends of those arrows, but not the mini-parentheses that are there now. Compare with the original to see how it should look.

page 12: On line -7, replace \mathfrak{X} with χ . Compare with the original.

page 13:

line 2: remove the space at the left end, and this should then nicely bring up the equals sign from beginning of the next line to the end of line 2 (which is where it belongs).

line 6: Same error as mentioned on page 12

line 12: "coefficients" rather than "coefficient".

line 17: replace $\Gamma(U, \pi^* \mathcal{F})$ with $\Gamma(V, \pi^* \mathcal{F})$.

page 14: line -1: replace \mathcal{O}_x with \mathcal{O}_X .

page 17:

line 9: In the Corollary on this page, replace “*br-linearly*” with “**R-linearly**”. (This same error occurs in several other places, so may be due to a common cause.)

line 15: several boldface fonts are wrong. Replace **V** with V , and replace **T** (twice) with T .

page 19:

line 9: “exist” rather than “exists”

line -1: In the lower right part of the diagram at the bottom, some brackets are missing. It should read: $\text{Ker}[H^2(X, \mathbf{Z}) \rightarrow H^2(X, \mathcal{O}_X)]$.

page 20: In the big displayed diagram in the lower half of the page, the expression “ $= \text{Pic}^0(X)$ ” is very poorly placed! Please see the original for how it should look.

Also, on the line immediately below this big diagram, the first word on the line should be “where” rather than “Where”.

page 22:

line 9: In condition (c), the H^1 at the start should be H^i .

page 23:

In the statement and proof of the Lemma there are some math typos that were also in the original version. In this setup, Y is just a topological space, so there is no \mathcal{O}_Y in the picture. Hence, it should not be mentioned in the Lemma. That is, the statement of the Lemma should be: *If \mathcal{F} is an injective abelian sheaf on Y then $\pi^*\mathcal{F}$ is a flasque sheaf and $\Gamma(\pi^*\mathcal{F})$ an injective G -module.* Also, in the proof, the three appearances of $\text{Hom}_{\mathcal{O}_Y}$ should be replaced with Hom_Y .

page 24: line 2: replace “section” with “sections”.

page 25: 2 lines above the Proposition, replace “always” with “as always” (as in the original).

page 26, line 6: replace $\text{Hom}_{\mathbf{Z}}(\widehat{U}', \mathbf{Z})$ with “ $\text{Hom}_{\mathbf{Z}}(U, \mathbf{Z}) = \widehat{U}'$ ” (as in the original).

page 30: line -14: replace a' with A' (as in the original) on the right side of the equation.

page 35: On the third line below the big displayed expression, there is an incorrect use of bold font: replace $\Lambda_{\mathbf{C}}^2 \mathbf{T}$ with $\Lambda_{\mathbf{C}}^2 T$. (Only **C** should be in bold font.) Also, two lines below this, the notation $\text{Im}(\text{Hom}(U, \mathbf{Z}))$ (which is as in the original) is unfortunate since here “Im” means “Image” whereas in the preceding discussion it is frequently used to denote “imaginary part”. So replace this “Im” with “Image”.

page 40, line -9: the symbols for “divides” (\mid) and “does not divide” (\nmid) are very poorly generated in this version. On line -9 we see a very poor rendition of what should say “ $p \nmid n$ ”. Please universally fix this kind of appearance of that symbol (which occurs in many places).

page 44, line 3: replace *flatover* with “*flat over*”.

page 45:

line -14: at the end of the line it should read “ $K^{nm} \xrightarrow{\lambda} H^m(C^\bullet)$ ”, with the arrow raised to the middle of the line.

line -4: there is a very bad line break; at least replace “ $\ker \partial^0 \cap \ker \phi_0$ ” with “ $(\ker \partial^0 \cap \ker \phi_0)$ ” if you are going to maintain that line break.

page 46, line -2: replace ∂^P with ∂^p .

page 47:

line 10: replace $\otimes_{\mathcal{O}_y}$ with $\otimes_{\mathcal{O}_Y}$ (as in the original).

line 12: The Corollary should be labelled as Corollary 1 (to which it is referred to as such in the proof of Lemma 2 on page 49!). This was an error in the original as well.

line -6: replace “be a free” with “to be a free”

line -4: replace $K(y)$ with $k(y)$.

page 50: In the first line of Corollary 3, replace “*fand*” with “*f and*”.

page 51: In the statement of Corollary 5, the same correction as on page 50. In the statement of Corollary 6, in the displayed expression defining T_1 , the fonts are wrong at the right side: both X and t should be in italics. So it should read “ $X \times \{t\}$ ” at the end. (Clearly whomever typed “is trivial on” forgot to end the un-italicizing command after the text ended.)

page 52:

line 12: replace $X\{t\}$ with $X \times \{t\}$ in the middle of the line

line 14: in the displayed expression replace $(k(t))$ with $k(t)$ to conform with Mumford’s running notational convention for fibers of sheaves.

line -2: replace $\widehat{X}_i \times X_n$ on the left side with $\widehat{X}_i \times \cdots \times X_n$ (as in the original)

page 55:

line 9: replace P_{23}^{-1} with p_{23}^{-1} on the right side of the line

line 11: replace $D_{U'}$ with $\widehat{D}_{U'}$ on the right side of the equation.

line -11: there is a missing comma that should appear at the very end of the line (beyond the right parenthesis).

page 56: In the statement of Corollary 3, on the right side of the displayed expression the asterisk is misplaced. It should read “ $\otimes(-1_X)^* L^{\frac{(n^2-n)}{2}}$.”

page 60:

line 4: insert a comma before “we see” so it reads as: $y \in Y$, we see”.

line 5: Near the end of the displayed expression labelled (*) on line 5, there is poor spacing. Compare with the original.

line 13: there is poor spacing before the † symbol (twice!)

line -9: poor spacing around the | symbol (too much space); compare with the original.

line -1: same comment as for line 13.

page 61: On line 1, again poor spacing before †.

page 62:

line 3: should be H^{p+q} rather than H^n (i.e., $H^{p+q}(Y, f^*(\underline{L}^n))$).

line -7: the subscripts x and y should be in italics, not Roman font. That is: $\widehat{\mathcal{O}}_x$ and $\widehat{\mathcal{O}}_y$ (compare with subscript fonts on the next line).

page 63: On line -4, the range for the subscript i should read as $1 \leq i \leq \nu$, not $1 \leq i \leq v$. That is, use the Greek letter ν rather than the Roman letter v ; compare with the final line on this page (or line -6).

page 64: On line 13, the right half should read “ $\phi_g(f) = gf - f, g \in G$ ” (subtraction sign was mistyped).

page 65: On line -3, italicize the word “quotient” (as in the original)

page 66: 3 lines above Proposition 2, replace “ G -sheaf” with “ G -sheaf” (italicize as in the original)

page 70: In the displayed triangle of arrows at the top, the arrow labeled g is pointing the wrong way (it should go from X to X/K). The original had it correctly.

page 71, line -2: the expression “ $s \in S$ ” should be “ $s \in S$ ” (note the fonts), as in the original

page 73, line -6: at the end of the line, replace the colon with a period (as in the original)

page 74, line -3: misplaces asterisk. Should read as $(1_X \times \pi)^*P$.

page 76: In the footnote at the bottom, replace “char, = 0” with “char. = 0” (as in the original)

page 81: On line -11, the exponent is wrong. Should be $-\pi B(u_1, a_2)$ (the typo was also in the original)

page 82:

line 2: italicize “and vice versa” as the end (as in the original)

line 7: replace X with \widehat{X} on the left side.

page 83, line -7: the overline is too short: should be $2\pi i \overline{\overline{z}}$ rather than $2\pi i \overline{z}$.

page 85, line -13: replace “Künneth” with “Künneth” (remove italics)

page 86, line -13: replace “here” with “where” (as in original)

page 88: line -6, replace “ $H^1(X \times Y, \mathcal{O}_{X \times Y} \rightarrow$ ” with “ $H^1(X \times Y, \mathcal{O}_{X \times Y}) \rightarrow$ ”.

page 89: line 9: “is fixed” rather than “if fixed”.

page 91, line -5: italicization is needed. Replace “vector field” with “*vector field*” as in the original.

page 97, line -5: replace \mathbf{G}_m with \mathbf{G}_m ; note the unbold subscript. This specific mistake (with \mathbf{G}_m rather than \mathbf{G}_m) happens a lot! So I assume it was some error in a global definition of some TeX command. Please fix them all.

page 100:

line 2: “schemes” rather than “scheme”

line 11: “ $x \in X$ ” rather than “ $x = \in X$ ”

line 16: missing period at the end of the displayed expression.

page 103, line 8: should read “then $T_x \circ T_y = T_{xy}$,” (as in the original).

page 106, line -8: should read “ $\det(a - \mu^*(a)) = \chi_a(a)$ ” (the thing inside of the determinant is off by a minus sign). The reason this is correct is due to how $\mu^*(a)$ appears on line -10.

page 107: In the big displayed diagram, the bottom arrow should be labelled $\lambda_{g \circ f, h}$, not $\lambda_{g \circ f \circ h}$, as in the original.

page 112: in the displayed expression 5 lines above Corollary 2, replace $\otimes_{\mathcal{O}_y}$ with $\otimes_{\mathcal{O}_Y}$ (typo in the original too)

page 113, line 17–18: a lot of repeated text was inserted. Remove “ $U = (X \times F)/G$ exists ... natural morphism”. Compare with the original.

page 114, line -1: replace X_n with x_n (as in the original).

page 116:

line 13: replace “definite” with “define”

line -6: replace $T_{(x,o)}^*$ with $T_{(x,0)}^*$ (compare with the original: o versus 0).

page 117:

line -12: replace $S \times X$ with $S \times \widehat{X}$

line -8: replace $S_0 \times X$ with $S_0 \times \widehat{X}$

page 119:

line 1: replace $\mathcal{O}_{0,\widehat{x}}$ with $\mathcal{O}_{0,\widehat{X}}$ (compare with the original)

line -12: replace “ $\mathfrak{A} \cdot N \geq 0$ ” with “ $\mathfrak{A} \cdot N = 0$ ”.

page 120:

On third line below top displayed expression, replace “ $H^0(\Gamma_S, \mathcal{O}_{\Gamma_S} =$ ” with “ $H^0(\Gamma_S, \mathcal{O}_{\Gamma_S}) =$ ” (i.e., reinsert missing right parenthesis).

line -6: in the displayed expression, \widehat{K}_{g-1} rather than \widehat{k}_{g-1} .

page 125, line -19: replace “by, \widehat{G} ” with “by \widehat{G} ” (i.e., remove stray comma)

page 128, line -11: replace \mathbf{G}_m with \mathbf{G}_m

page 129, line 6: in the displayed expression, on the right replace R^* with R^* .

page 136, line -11: replace $\mathfrak{M}_{X,o}^{(p)}$ with $\mathfrak{M}_{X,0}^{(p)}$ (i.e., o versus 0).

page 137:

line 1: replace “Let x ” with “Let X ”

line -11: some missing commas from the original: “, that is, p^{nrx} ” (two commas missing)

page 138: on line -2, s_2^p should be s_p^2 (compare with the original)

page 139: on line -7 (in the displayed expression), replace $G(M')$ with $\underline{G}(M')$ (this typo was in the original), and likewise on line 6 of this final paragraph replace $G(M)$ with $\underline{G}(M)$ (this was correct in the original).

page 140: on line 2, “represented by the 1-cocycle” (the word “the” is missing)

page 143:

line 1: should have $R^g p'_{2,*}$ rather than $R^g p'_{2,*}$ (wrong exponent), as in the original.

line 10: in the big displayed sum near the middle of the page, replace $h_i(L)h^{q-i}(L^{-1})$ with $h^i(L)h^{q-i}(L^{-1})$ (i.e., a subscript should be a superscript, as in the original)

page 144, line -5: “**R**-basis” rather than “ br -basis”.

page 146, line -4: missing comma: “ $T_x^*(L)$, hence” (compare with the original)

page 147:

line 4: $P(1, t)$ rather than $P(l, t)$

On third line of Step B, “ $F(t, 1 - t) \neq 0$ ” rather than “ $F(t, 1 - t) = 0$ ” (compare with the original)

page 148: On line -11, $R^j \nu_*(L)$ rather than $R^j \nu(L)$ (i.e., missing asterisk subscript).

page 149:

line -8: missing right parenthesis: $H^p(L_1^k \otimes L_2^l|_{H^\alpha})$ in the middle of the line (compare with the original).

line -1: on the right side of the arrow, H^{i_1} rather than H^i ; compare with the original.

page 151: In the big displayed expression for g four lines above the Corollary, in the first two terms contained in big parentheses, the r 's should both be in italics (compare with the original)

page 152: In the big matrix at the top of the page, some vertical lines are missing parts; compare with the original.

page 154, line -10: missing comma at end of line (compare with original): “ D' ,” rather than “ D' ”

page 155: on line -6, there is a stray comma. Should read “ $\sigma_2(Y)$ is a bijection”.

page 157:

line 15: colon rather than period before “consider” (compare with original)

In the bottom big displayed expression, at the top should say $y'_0 \in Y'$ and at the bottom it should say $y''_0 \in Y''$ (compare with original)

page 158: On line 13, replace “by” with “By”.

page 159:

In the diagram at the top of the page, the arrow π_n is pointing the wrong way (compare with original)

line -2: bad positioning of the letter U : should read $\varprojlim U/l^n U$ (compare with original)

line -1: the label for the arrow should be 1 rather than l (see original).

page 160:

line 9: should read $\mathbf{Q} \otimes_{\mathbf{Z}} \text{Hom}(X, Y)$ (missing \mathbf{Z} ; compare with original)

line 12: missing comma before “so that” (compare with original)

Just above Theorem 1, in the displayed expression, the positioning of the direct limit symbol and the stuff below it is really bad. Compare with the original to see how it should look. Also, there is a typo within this: should say “ $X' \rightarrow X$ ” rather than “ $X \rightarrow X$ ”.

page 161: “positive definite” rather than “positive finite”

page 162:

line 5: There should be a clear empty line right after line 5, as in the original text, to make it clear that the proof has just ended.

line -3: Just above this line there should again be a clear empty line, as in the original text, to make it clear that the proof has just ended.

page 167: line just below top displayed expression: there is a stray comma. Should say “isomorphism of” (as in original text).

page 170: on line 10 there is a stray comma (just before “with”); compare with original.

page 173:

lines 13 and 15: $T_{(i+1)b}^{-1}$ rather than $T_{(i+1)^b}^{-1}$ (compare with original)

line -1: the left term superscript should be f^*L rather than $f * L$ (i.e., E^{f^*L}). Compare with original.

page 174:

line 2: same superscript error as at end of page 173; compare with original.

line 12: stray comma. Should be “ $X \times (0)$ in” at beginning of line (see original)

line -9: in displayed expression there is a missing left parenthesis in the subscript on the left: should be $T_{(x, \hat{x})}^*$ rather than $T_{x, \hat{x}}^*$.

page 175:

line 11: On second line of Remark, should say “ $\phi = \phi_{L'}$ ” rather than $\phi = \phi_L$ (compare with original).

line -3: missing comma: should say “ E^L , that” (compare with original)

page 176: On line 15 the spacing is truly horrible!! Please fix it up; compare with original.

page 177: on line -5, some missing notation. Should read $\psi|_{\widehat{X}_{l^n}} : \widehat{X}_{l^n} \rightarrow X_{l^n}$ (i.e., \widehat{X} in place of X twice); the original had this typo too.

page 178:

line 11: there is a double period (before “Thus”). Only one is needed, so remove the other.

lines -3, -5: In the two bottom-most displayed expressions, twice $[E^L]^{Ag-1}$ should be replaced with $[E^L]^{\Lambda(g-1)}$ (i.e. missing pairs of parentheses) to make the notation clearer. (These typos were also in the original.)

page 179:

line 1: Same error as at bottom of page 178

line 7: in the huge displayed string of equalities, line up the equals signs (as in the original)!! It looks totally bizarre now.

page 181: line -5: “but the transpose” (compare with original)

page 183:

line 21, line 22: $(\overline{A}^t)^{-1}$ rather than \overline{A}^{t-1} (once per line)

page 184:

line 1: this is the first place I noticed of a truly huge number of occurrences of the non-word “upto” (which of course should be “up to”). Strangely, the many occurrences of this were all in the original; I have no idea why Mumford did this. Should all be fixed via global search and replace. I won’t mention all of the places where this occurs, as there are quite a lot.

lines 2 and 4: on each line, same error as at mentioned for lines 21 and 22 on page 183 (once on line 2, twice on line 4).

line 5: at the end should be $A\widehat{\beta}\beta A^{-1}$ (this typo also occurs in the original!)

page 189:

lines 7 and 8: missing commas (before “permutes” and “the involution”); compare with original.

line 10: replace $> .0$ with > 0 (i.e., stray period)

page 191: in the statement of Theorem 4, for the displayed expression defining N_n , the product symbol should have $2g$ rather than n on top; compare with original.

page 193: in line 7 of the proof of Theorem 6, there is a missing semi-colon (compare with original): “case $K = \mathbf{C}$; the other”.

page 194: on line 13, \mathcal{H}_t rather than \mathfrak{h}_t (compare with original).

page 197: on line 10, in the string of displayed equalities (the second line of this), should say $\alpha x \bar{y}$ rather than αxy . (This typo was in the original too.)

page 198: on line 5 (third line of big displayed string of equalities), x^{p-1} should be replaced with $x^{(p-1)/2}$ (as in the original).

page 202:

line 17: replace X_{lm} with X_{ln} (as in the original)

line -16: at the start of the line, replace “ $\text{Nm}_{\mathbf{K}/\mathbf{Q}}$ ” with “ $\text{Nm}_{K/\mathbf{Q}}$ ” (i.e., K instead of \mathbf{K}); compare with the original.

line -15: replace N_α with $N\alpha$. (Compare with original.)

page 204: Replace “this” with “This”

page 206:

line -9: replace “ K if finite γ ” with “ K is finite, γ ” (two typos)

line -4: stray comma near the left end: replace “ $1 \Leftrightarrow$, for some k , $\langle k \rangle$ ” with “ $1 \Leftrightarrow$ for some k , $\langle k \rangle$ ”

page 207: on line 2, \mathbf{G}_m rather than \mathbf{G}_m at the far right. (Subscript font error.)

page 209:

line 10: replace $\beta \circ \alpha^{-1}$ with $\beta^{-1} \circ \alpha$ (error in the original too)

lines -4 and -3: missing commas. Insert commas after $U_i \cap U_j$ on line -4 and before “so there” on line -3.

page 210: on line -6, should be a colon right after the D (as in the original)

page 213: on lines 13, 20, 23, and -9 the “ e_n ” should be “ \bar{e}_n ” in all places. (Some of these typos were in the original.)

page 217: line 14: missing right parenthesis: should say $(\widehat{H/D})$ on the far left.

page 219: On the first line below the big commutative square diagram in the middle, replace “ $\tilde{\mathcal{G}} \rightarrow$ ” with “ $\tilde{\mathcal{G}}_0 \rightarrow$ ” (missing subscript). Also, in the big displayed diagram a couple of lines below this, the big vertical equals sign linking the two appearances of \mathbf{C}^* is missing! Compare with the original to see how it should look.

page 223: on line -3, replace $h\phi$ with $h\varphi$ (wrong Greek style letter)

page 225: in the second line of the statement of Step III, at the end there is the wrong font: use k rather than \mathfrak{k} .

page 227:

line 1: $T_l(X)$ rather than $T_n(X)$.

line -3: at the left end of the line, replace $a_i \otimes \theta - i$ with $a_i \otimes \theta_i$ (compare with original).

page 229: on line 5 there is an extra right parenthesis: should say $\sigma(L_n^{p^N})^{l^n}$ rather than $\sigma(L_n^{p^N}))^{l^n}$.

page 231: on line 9, replace $\deg \lambda_n^*(L)$ with $\deg \phi_{\lambda_n^*(L)}$.

page 233: on line -16, replace $\text{End}_{\mathbf{Q}_l} V_l^{(G)}$ with $\text{End}_{\mathbf{Q}_l} V_l^{(G)}$.

page 237: on line -11, there is a misplaced set bracket and missing comma, so should read as: “ $T_z^*(L) \otimes L^{-1}|_Y$ is trivial },”

page 240:

line 3: replace “ $v \in I_i$ ” in summation subscript with “ $\nu \in I_i$ ” (i.e., replace v with ν)

line -16: replace “over \mathbf{Q} ” with “over \mathbf{Q} ” (missing space)

page 241:

line 1: replace “dividing l ” with “dividing p ”.

line 7: replace $\text{End}_{K_1}(X)$ with $\text{End}_{k_1}(X)$.

line 15: missing period before “This completes”

page 247: line -2: bad spacing before \dagger .

page 248: line 3: same error as for page 247.

page 251:

line 8: in summation index, replace w/v with $w|v$.

line -9: replace $k(x)$ with $K(x)$.

page 252:

line 3: on right side of displayed equation, replace v with v' in both places.

line -8: there is a subscript problem in the left side of the inequality. It should read as $\log |x_i''|_v$; compare with original.

page 255: on line 13, replace H_L with h_L .