

# Writing Greek with the **greek** option of the **babel** package

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## 1 Overview

The **greek** option of the **babel** package is an attempt to make it possible for someone to write Greek text with L<sup>A</sup>T<sub>E</sub>X. The current version of the **greek** option supports the πολυτονικό accentual system of the Greek language. Moreover, there is now support for Greek numerals. One can produce easily valid Greek numerals both in uppercase and lowercase forms, e.g., ,αϛιζ' and ,ΑϛιΖ'. The labels in second and fourth level enumerations are lowercase and uppercase Greek numerals correspondingly.

## 2 Typing Greek Text

T<sub>E</sub>X understands only the basic ASCII characters, so it is not possible to enter directly Greek letters. Instead, someone enters Latin letters which are mapped to their Greek “counterparts” by T<sub>E</sub>X. The following table shows the transliteration employed:

|   |   |   |   |   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| α | β | γ | δ | ε | ζ | η | θ | ι | κ | λ | μ | ν |
| a | b | g | d | e | z | h | j | i | k | l | m | n |
| ξ | ο | π | ρ | σ | τ | υ | φ | χ | ψ | ω | ς |   |
| x | o | p | r | s | t | u | f | q | y | w | c |   |

Please, note that in order to produce the letter σ in isolation one has to type sv. This feature is due to the strong ligature that T<sub>E</sub>X employs. In the “modern” μονοτονικό accentual system only one accent is used—οἷεῖα

(acute). In the traditional πολυτονικό accentual system we need more accents and breathing signs. We can produce an accented letter by prefixing the letter with the symbol that denotes the accent, e.g., >a'era produces the word ἄερας.<sup>1</sup> Here are the symbols that are recognized:

| Accent           | Symbol | Example     | Output   |
|------------------|--------|-------------|----------|
| acute            | '      | g'ata       | γάτα     |
| grave            | `      | dad'i       | δαδὶ     |
| circumflex       | ~      | ful~hc      | φουλῆς   |
| rough breathing  | <      | <'otan      | ὄταν     |
| smooth breathing | >      | >'aneu      | ἄνευ     |
| subscript        |        | >anate'ilh  | ἀνατεῖλῃ |
| dieresis         | "      | qa"ide'uh c | χαΐδεύῃς |

Note that the subscript symbol is placed **after** the letter. The last thing someone must know in order to be able to write normal Greek text is the punctuation marks used in the language:

| Punctuation Sign     | Symbol | Output |
|----------------------|--------|--------|
| period               | .      | .      |
| semicolon            | ;      | .      |
| exclamation mark     | !      | !      |
| comma                | ,      | ,      |
| colon                | :      | :      |
| question mark        | ?      | ;      |
| left apostrophe      | ‘      | ‘      |
| right apostrophe     | ’      | ’      |
| left quotation mark  | ((     | »      |
| right quotation mark | ))     | »      |

Using these conventions it is a straightforward exercise to write Greek πολυτονικό text. For example the following excerpt from Δύσκολος of Μένανδρος

Τί φής; Ἰδὼν ἐνθῆδε παῖδ' ἐλευθέραν  
τὰς πλησίον Νύμφας στεφανοῦσαν, Σώστρατε,  
ἔρῳ ἀπῆλθες εὐθύς;

can be produced by the following L<sup>A</sup>T<sub>E</sub>X code:

<sup>1</sup>For the technically inclined reader, we must say that T<sub>E</sub>X uses the ligature table of the font in order to determine the character that corresponds to the input character sequence.

T'i f'hic? <Id'wn >enj'ede pa~id'' >eleuj'eran  
t'ac plhs'ion N'umfac stefano~usan, S'wstrate,  
>er~wn 'ap~hljec e>uj'uc?

### 3 Producing Greek Text

Once the Greek language is selected with the command

`\selectlanguage{greek}`

whatever we type will be typeset with the Greek fonts. The command `\textlatin` can be used for short passages in some language that uses the Latin alphabet, while the the command `\latintext` changes the base fonts to the ones used by languages that use the Latin alphabet. However, all words will be hyphenated by following the Greek hyphenation rules! Similar commands are available once someone has selected some other language. The commands `\textgreek` and `\greektext` behave exactly like their “latin” counterparts. For example, the word Μίμης has been produced with the command `\textgreek{M'imhc}`. Please note that certain symbols cannot have their expected result for Greek text, unless someone has selected the Greek language, e.g., ~ is such a symbol.

As we have mentioned above this version of the `greek` option of the `babel` package supports the use of Greek numerals. The commands `\greeknumeral` and `\Greeknnumeral` produce the lowercase and the uppercase Greek numeral, e.g.,

| Command                           | Output |
|-----------------------------------|--------|
| <code>\Greeknnumeral{9999}</code> | ϠϠϠϠ   |
| <code>\greeknumeral{9999}</code>  | ϠϠϠϠ   |

In order to correctly typeset the greek numerals the greek option file provides the following commands:

| Command              | Output |
|----------------------|--------|
| <code>\qoppa</code>  | Ϡ      |
| <code>\sampi</code>  | Ϡ      |
| <code>\stigma</code> | Ϡ      |

In traditional Greek typography the first paragraph after a header is always indented, contrary to the habit of, say, American typography. This effect can be achieved by using the package `indentfirst`.

Additional greek symbols are available:

| Command                | Output |
|------------------------|--------|
| <code>\Digamma</code>  | Ɔ      |
| <code>\ddigamma</code> | Ɔ      |
| <code>\euro</code>     | €      |
| <code>\permill</code>  | ‰      |

The package `athnum` provides the command `\athnum`, with which one can produce the so called *Athenian numerals*:

| Command                    | Output         |
|----------------------------|----------------|
| <code>\athnum{1997}</code> | XϞHHHHϞΔΔΔΔΠΠΠ |

The package `grmath` renames the basic log-like functions with their greek counterparts:

| Command                               | Output                                    |
|---------------------------------------|---|
| <code>\$_sin^{2}x+cos^{2}x=1\$</code> | $\eta\mu^2 x + \sigma\upsilon\nu^2 y = 1$ |