

*Hello, I'd
like you
to meet*

Gina

GINA IS A TYPEFACE with a robust texture and an extensive set of glyphs that have a distinct, legible appearance.

The Gina family includes Greek and accented characters, mathematical symbols, alternate forms, italic and small cap styles, and more.

Gina and Gina Italic are available as
PostScript-based OpenType fonts.

Gina

A SERIF TYPEFACE FOR BOOKS AND MORE

Although many kinds of material may benefit from Gina's features, it was designed for technical and academic publications that call for immersive reading as well as clarity of complex texts. The fine details in Gina and Gina Italic reveal an interplay of forms that swell gently in some places and crisply intersect in others, creating a rhythm between its gentler and its more assertive shapes.

Gina has a sturdy weight that produces a strong text colour, even at small sizes. It includes real superiors, inferiors, and small caps adjusted to work with the main text size.

Individual characters fit together easily to promote overall ease of reading, but they can also combine in equations, formulae, foreign terms, or precise technical language without ambiguity. Latin and Greek characters, numerals, and mathematical symbols all work in harmony as well as on their own. OpenType features allow access to alternate forms and styles for some characters to further enhance their clarity.

A b ç δ

m m m

5 f g H i

DISTINCT FORMS

Gina makes it easy to distinguish between forms that might be confused for one another. This is always a benefit for the reader, but it is crucial for mathematical and scientific texts that may mix roman, italic, and Greek characters in unfamiliar sequences. Since any ambiguity about which character is which may change the meaning of the equation, it is essential that all characters can be recognized at a glance.

Below: the alternate lowercase a, italic a, and Greek alpha. Bottom: the lining figure one, the uppercase I, the lowercase l and i, and the oldstyle figure one.

a a a

1 1 1 i i 1

v v v

*Above: the lowercase v, italic v, and Greek nu.
Below: the lowercase p, italic p, and Greek rho.
Bottom: the lowercase u, italic u, and
Greek upsilon.*

p p p

u u u

NUMERALS

Gina contains four sets of full-size numerals to meet a variety of typesetting needs. The default style is lining figures with proportional spacing, but you can also set lining figures with tabular spacing or oldstyle figures with either proportional or tabular spacing. (Inferior and superior styles use lining figures spaced proportionally, and small caps use proportional oldstyle figures by default.)

1234567890

01234567890

1234567890

01234567890

1 2 3 4

Proportional lining figures

GBP (£)1=	EUR (€)1=	YEN (¥)100=	USD (\$)1=
EUR 1.47667	USD 1.37760	EUR 0.59581	EUR 0.72590
USD 2.03426	GBP 0.67720	USD 0.82078	GBP 0.49158
YEN 247.84369	YEN 167.83992	GBP 0.40348	YEN 121.83500

Tabular lining figures

GBP (£)1=	EUR (€)1=	YEN (¥)100=	USD (\$)1=
EUR 1.47667	USD 1.37760	EUR 0.59581	EUR 0.72590
USD 2.03426	GBP 0.67720	USD 0.82078	GBP 0.49158
YEN 247.84369	YEN 167.83992	GBP 0.40348	YEN 121.83500

Proportional oldstyle figures (with small caps)

GBP (£)1=	EUR (€)1=	YEN (¥)100=	USD (\$)1=
EUR 1.47667	USD 1.37760	EUR 0.59581	EUR 0.72590
USD 2.03426	GBP 0.67720	USD 0.82078	GBP 0.49158
YEN 247.84369	YEN 167.83992	GBP 0.40348	YEN 121.83500

Tabular oldstyle figures (with small caps)

GBP (£)1=	EUR (€)1=	YEN (¥)100=	USD (\$)1=
EUR 1.47667	USD 1.37760	EUR 0.59581	EUR 0.72590
USD 2.03426	GBP 0.67720	USD 0.82078	GBP 0.49158
YEN 247.84369	YEN 167.83992	GBP 0.40348	YEN 121.83500

1 2 3 4

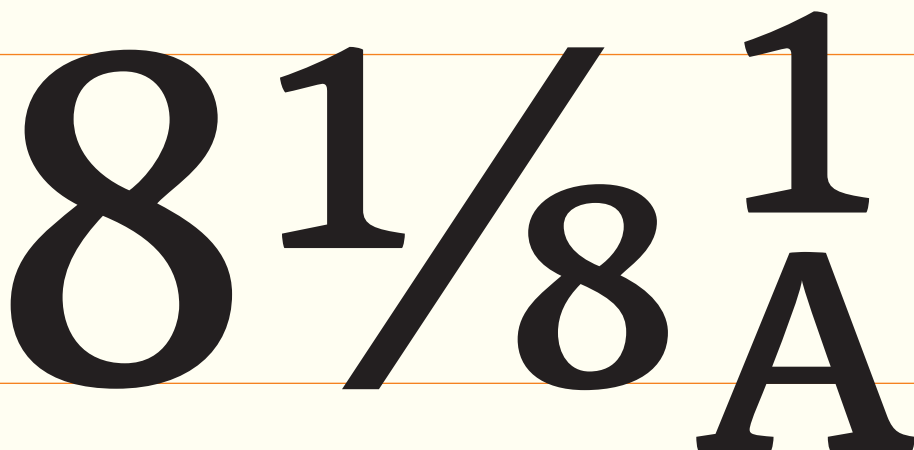
OPTICAL SIZES

Gina and Gina Italic contain superior and inferior forms for numerals and the basic Latin alphabet. In addition, Gina's roman style includes small caps for the Latin and Greek alphabets, including some accented characters and punctuation adjusted for use with the smaller forms.

Numerals drawn for use at smaller optical sizes can be positioned for use as numerators and denominators in case fractions. (Some precomposed fractions are also available). Superior and inferior characters are positioned so that they can be stacked on top of one another.

The small caps and superior/inferior glyphs have all been modified so that they relate properly to their full-size counterparts. Details such as counters and stroke weights, for instance, are larger in proportion to the overall size to maintain the overall colour of the text.

A full-size numeral is shown beside a fraction using the numerator and denominator figures, and a superior figure stacked above an inferior letter. These forms are available in both the roman and the italic styles of Gina.





Two large, bold, black serif capital letters 'M' and 'M' are displayed side-by-side. The first 'M' is significantly larger than the second 'M'.

Superior, inferior, and small cap forms in Gina are more than just small copies of their full-size counterparts. Rather, they are optimized to blend easily with them.



A large serif capital 'M' is followed by a smaller serif capital 'M'. The smaller 'M' is positioned to the right and slightly below the larger one, demonstrating how the design maintains proportionality.

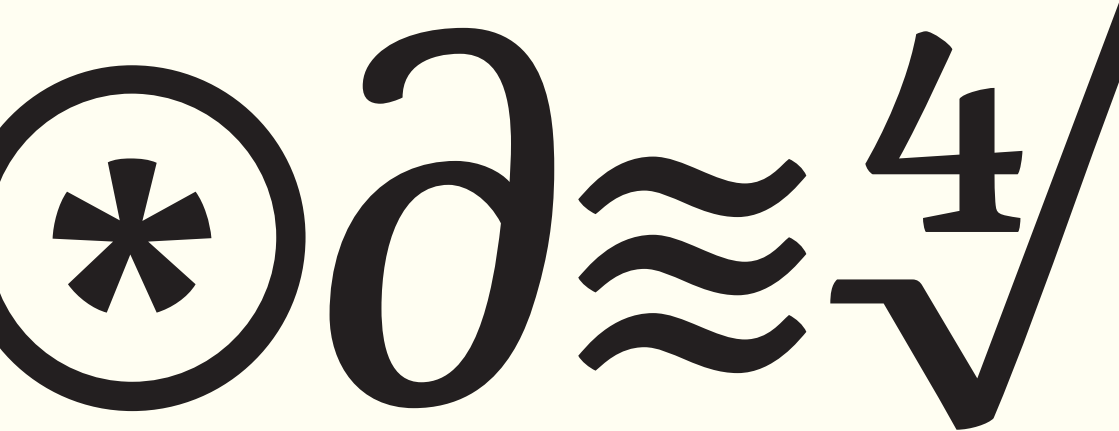


Two identical large serif capital 'M' letters are displayed side-by-side, separated by a thin horizontal line above and below them.

MATHEMATICS

Equations, chemical formulae, tables, and other combinations of text, numerals, and symbols need glyphs with enough individual clarity that they can be easily read when appearing outside of typical word shapes, or when shown in very small sizes. Equations, for example, may feature a mix of italic characters, Greek characters, and mathematical symbols, any of which may be shown at a typical text size or smaller.

Although Gina was primarily designed for text, its design accommodates the demands of mathematical material. It includes a large set of symbols that enable the setting of a wide variety of basic equations.



$$x'_t = h(z)F_2 - g(y)F_3, \quad y'_t = f(x)F_3 - h(z)F_1, \quad z'_t = g(y)F_1 - f(x)F_2$$

Here, $F_n = F_n(x, y, z, t)$ are arbitrary functions. First integral:

$$\int f(x)dx + \int g(y)dy + \int h(z)dz = C_1$$

where C is an arbitrary constant. If the function F_n is independent of t , then, by eliminating t and z from the first two equations of the system (with the above integral), one arrives at a first-order equation.

4.4 FACTORIAL FACTORS

Now let's take a look at the factorization of some interesting highly composite numbers, the factorials:

$$n! = 1 \cdot 2 \cdot \dots \cdot n = \prod_{k=1}^n k, \quad \text{integer } n \geq 0. \tag{4.21}$$

According to our convention for an empty product, this defines $0!$ to be 1. Thus $n! = (n-1)n!$ for every positive integer n . This is the number of permutations of n distinct objects. That is, it's the number of ways to arrange n things in a row: There are n choices for the first thing; for each choice of first thing, there are $n-1$ choices for the second; for each of these $n(n-1)$ choices, there are $n-2$ for the third; and so on, giving $n(n-1)(n-2)\dots(1)$ arrangements in all. Here are the first few values of the factorial function.

n	0	1	2	3	4	5	6	7	8	9	10
$n!$	1	1	2	6	24	120	720	5040	40320	362880	3628800

It's useful to know a few factorial facts, like the first six values, and the fact that $10!$ is about $3\frac{1}{2}$ million plus change; another interesting fact is that the number of digits in $n!$ exceeds n when $n \geq 25$.

We can prove that $n!$ is plenty big by using something like Gauss's trick of Chapter 1:

$$n!^2 = (1 \cdot 2 \cdot \dots \cdot n) (n \cdot \dots \cdot 2 \cdot 1) = \prod_{k=1}^n k(n+1-k).$$

*Two excerpts from Concrete Mathematics
(Graham, Knuth, Patashnik, 1994):*

9 PT. TEXT WITH 13 PT. LEADING

LANGUAGE SUPPORT

Gina can be used to set text in many languages that use the Latin and Greek alphabets, including Afrikaans, Albanian, Azeri, Bari, Basque, Belarusian Łacinka, Breton, Catalan, Cornish, Creole, Croatian, Czech, Danish, Dutch, English, Esperanto, Estonian, Faroese, Filipino, Finnish, French, Frisian languages, Friulian, Galician, German, Greek, Guaraní, Hungarian, Icelandic, Irish, Italian, Kabyle, Kalaallisut, Kashubian, Kurmanji Kurdish, Latin, Latvian, Lithuanian, Luganda, Luxembourgish, Malay, Maltese, Latin-based Mandinka, Manx, Norwegian, Pársik (Persian), Polish, Portuguese, Romanian, Romansh, some Sami languages, Scots Gaelic, Serbian, Shelta, Slovak, Slovenian, Sorbian, Spanish, Swedish, Turkish, Vietnamese, Walloon, Welsh, and Wolof.

Gina also contains a wide variety of accent marks that can be combined with the Latin and Greek glyphs to set even more characters than the ones already supplied.



OpenType features assist with some aspects of linguistic support, such as the removal of the Greek *tonos* from text set with capitals and the substitution of the *kreska* for the acute accent in Polish.

Όταν δε τρία μεγέθη ανάλογον η, το πρώτον προς το τρίτον διπλασίονα λόγον έχειν λέγεται ήπερ προς το δεύτερον.

GREEK TEXT WITH UPPER- AND LOWERCASE

ΌΤΑΝ ΔΕ ΤΡΙΑ ΜΕΓΕΘΗ ΑΝΑΛΟΓΟΝ Η, ΤΟ ΠΡΩΤΟΝ ΠΡΟΣ ΤΟ ΤΡΙΤΟΝ ΔΙΠΛΑΣΙΟΝΑ ΛΟΓΟΝ ΕΧΕΙΝ ΛΕΓΕΤΑΙ ΗΠΕΡ ΠΡΟΣ ΤΟ ΔΕΥΤΕΡΟΝ.

GREEK TEXT WITH CAPITALS

Andrzej Tadeusz Bonawentura Kościuszko, herbu Roch III (ur. 4 lutego 1746, zm. 15 października 1817) — generał polski i amerykański, inżynier fortyfikator, walczył o niepodległość Polski i USA, Najwyższy Naczelnik Siły Zbrojnej Narodowej w insurekcji 1794.

POLISH TEXT WITH DEFAULT ACCENTS

Andrzej Tadeusz Bonawentura Kościuszko, herbu Roch III (ur. 4 lutego 1746, zm. 15 października 1817) — generał polski i amerykański, inżynier fortyfikator, walczył o niepodległość Polski i USA, Najwyższy Naczelnik Siły Zbrojnej Narodowej w insurekcji 1794.

POLISH TEXT WITH CORRECT ACCENTS

η ü e ó

SETTING TEXT WITH GINA

THE WORD “MATHEMATICS” (Greek: μαθηματικά or *mathēmatiká*) comes from the Greek μάθημα (*máthēma*), which means *learning, study, science*, and additionally came to have the narrower and more technical meaning “mathematical study”, even in Classical times. Its adjective is μαθηματικός (*mathēmatikós*), related to learning, or studious, which likewise further came to mean mathematical. In particular, μαθηματικά τέχνη (*mathēmatiké tékhnē*), in Latin *ars mathematica*, meant the mathematical art. The apparent plural form in English, like the French plural form *les mathématiques* (and the less commonly used singular derivative *la mathématique*), goes back to the Latin neuter plural *mathematica* (Cicero), based on the Greek plural τα μαθηματικά (*ta mathēmatiká*), used by Aristotle, and meaning roughly “all things mathematical”. In English, however, *mathematics* is a singular noun, often shortened to *math* in English speaking North America and *maths* elsewhere.

Excerpt from the Wikipedia entry for
“mathematics”

14 PT. TEXT WITH 20 PT. LEADING

THE WORD “MATHEMATICS” (Greek: μαθηματικά or *mathēmatiká*) comes from the Greek μάθημα (*máthēma*), which means *learning, study, science*, and additionally came to have the narrower and more technical meaning “mathematical study”, even in Classical times. Its adjective is μαθηματικός (*mathēmatikós*), related to learning, or studious, which likewise further came to mean mathematical. In particular, μαθηματικά τέχνη (*mathēmatiké tékhnē*), in Latin *ars mathematica*, meant the mathematical art. The apparent plural form in English, like the French plural form *les mathématiques* (and the less commonly used singular derivative *la mathématique*), goes back to the Latin neuter plural *mathematica* (Cicero), based on the Greek plural τα μαθηματικά (*ta mathēmatiká*), used by Aristotle, and meaning roughly “all things mathematical”. In English, however, *mathematics* is a singular noun, often shortened to *math* in English speaking North America and *maths* elsewhere.

10 PT. TEXT WITH 15 PT. LEADING

THE WORD “MATHEMATICS” (Greek: μαθηματικά or *mathēmatiká*) comes from the Greek μάθημα (*máthēma*), which means *learning, study, science*, and additionally came to have the narrower and more technical meaning “mathematical study”, even in Classical times. Its adjective is μαθηματικός (*mathēmatikós*), related to learning, or studious, which likewise further came to mean mathematical. In particular, μαθηματικά τέχνη (*mathēmatiké tékhnē*), in Latin *ars mathematica*, meant the mathematical art. The apparent plural form in English, like the French plural form *les mathématiques* (and the less commonly used singular derivative *la mathématique*), goes back to the Latin neuter plural *mathematica* (Cicero), based on the Greek plural τα μαθηματικά (*ta mathēmatiká*), used by Aristotle, and meaning roughly “all things mathematical”. In English, however, *mathematics* is a singular noun, often shortened to *math* in English speaking North America and *maths* elsewhere.

8 PT. TEXT WITH 13 PT. LEADING

A mole is the amount of a substance that contains as many elementary entities (atoms, molecules or ions) as there are atoms in 0.012 kilogram (or 12 grams) of carbon-12, where the carbon-12 atoms are unbound, at rest and in their ground state. The number of atoms in 0.012 kilogram of carbon-12 is known as the Avogadro constant, and is determined empirically. The currently accepted value is $6.02214179(30) \times 10^{23} \text{ mol}^{-1}$.

12 PT. TEXT WITH 16 PT. LEADING

A mole is the amount of a substance that contains as many elementary entities (atoms, molecules or ions) as there are atoms in 0.012 kilogram (or 12 grams) of carbon-12, where the carbon-12 atoms are unbound, at rest and in their ground state. The number of atoms in 0.012 kilogram of carbon-12 is known as the Avogadro constant, and is determined empirically. The currently accepted value is $6.02214179(30) \times 10^{23} \text{ mol}^{-1}$.

10 PT. TEXT WITH 14 PT. LEADING

A mole is the amount of a substance that contains as many elementary entities (atoms, molecules or ions) as there are atoms in 0.012 kilogram (or 12 grams) of carbon-12, where the carbon-12 atoms are unbound, at rest and in their ground state. The number of atoms in 0.012 kilogram of carbon-12 is known as the Avogadro constant, and is determined empirically. The currently accepted value is $6.02214179(30) \times 10^{23} \text{ mol}^{-1}$.

9 PT. TEXT WITH 12 PT. LEADING

A mole is the amount of a substance that contains as many elementary entities (atoms, molecules or ions) as there are atoms in 0.012 kilogram (or 12 grams) of carbon-12, where the carbon-12 atoms are unbound, at rest and in their ground state. The number of atoms in 0.012 kilogram of carbon-12 is known as the Avogadro constant, and is determined empirically. The currently accepted value is $6.02214179(30) \times 10^{23} \text{ mol}^{-1}$.

8 PT. TEXT WITH 11 PT. LEADING

A mole is the amount of a substance that contains as many elementary entities (atoms, molecules or ions) as there are atoms in 0.012 kilogram (or 12 grams) of carbon-12, where the carbon-12 atoms are unbound, at rest and in their ground state. The number of atoms in 0.012 kilogram of carbon-12 is known as the Avogadro constant, and is determined empirically. The currently accepted value is $6.02214179(30) \times 10^{23} \text{ mol}^{-1}$.

12 PT. TEXT WITH 16 PT. LEADING

A mole is the amount of a substance that contains as many elementary entities (atoms, molecules or ions) as there are atoms in 0.012 kilogram (or 12 grams) of carbon-12, where the carbon-12 atoms are unbound, at rest and in their ground state. The number of atoms in 0.012 kilogram of carbon-12 is known as the Avogadro constant, and is determined empirically. The currently accepted value is $6.02214179(30) \times 10^{23} \text{ mol}^{-1}$.

10 PT. TEXT WITH 14 PT. LEADING

A mole is the amount of a substance that contains as many elementary entities (atoms, molecules or ions) as there are atoms in 0.012 kilogram (or 12 grams) of carbon-12, where the carbon-12 atoms are unbound, at rest and in their ground state. The number of atoms in 0.012 kilogram of carbon-12 is known as the Avogadro constant, and is determined empirically. The currently accepted value is $6.02214179(30) \times 10^{23} \text{ mol}^{-1}$.

9 PT. TEXT WITH 12 PT. LEADING

A mole is the amount of a substance that contains as many elementary entities (atoms, molecules or ions) as there are atoms in 0.012 kilogram (or 12 grams) of carbon-12, where the carbon-12 atoms are unbound, at rest and in their ground state. The number of atoms in 0.012 kilogram of carbon-12 is known as the Avogadro constant, and is determined empirically. The currently accepted value is $6.02214179(30) \times 10^{23} \text{ mol}^{-1}$.

8 PT. TEXT WITH 11 PT. LEADING

Velocity Criterion

This Appendix describes a method for establishing a velocity criterion for screening piping systems. Using these procedures, piping systems requiring further analysis can be determined. This Appendix is to be used in conjunction with Part 3, para. 5.1.2.4.

D1. VELOCITY CRITERION

The expression for allowable peak velocity from Part 3, para. 5.1.2.4 is

$$V_{\text{allow}} = \frac{C_1 C_4}{C_3 C_5} \times \frac{\beta(S_{e1})}{\alpha C_2 K_2}$$

where

C_1 = correction factor that compensates for the effect of concentrated weights. If concentrated weight is less than 17 times the weight of the span for straight beams, L-bends, U-bends, and Z-bends, a conservative value of 0.15 can be used for screening purposes.

$C_2 K_2$ = stress indices as defined in the ASME Code; $C_2 K_2 \leq 4$ for most piping systems

C_3 = correction factor accounting for pipe contents and insulation; for contents and insulation equal to the weight of the pipe, the value would be 1.414; in most cases it is less than 1.5

C_4 = correction factor for end conditions different from fixed ends and for configurations different from straight spans
= 1.33 for cantilever and simply supported beam

= 0.74 for equal leg z-bend

= 0.83 for equal leg U-bend

C_5 = correction factor that is used when measured frequency differs from the first natural frequency of the piping span; for frequency ratios less than 1.0, the value is 1.0

Sel, α = see Part 3, para. 3.2.1.2

β = see Part 3, para. 5.1.2.4

D2. SCREENING VELOCITY CRITERION

If conservative values of the correction factors are combined, a criterion can be derived that should indicate safe levels of vibration for any type of piping configuration. Using this criterion, piping systems can be checked and those with vibration velocity levels lower than the screening value would require no further analysis. Piping systems that have vibration velocity levels higher than the screening value do not necessarily have excessive stresses, but further analysis is necessary to establish their acceptability.

The following correction factors are considered to be conservative values and should be applicable to most piping configurations; however, the conservatism for extremely complex piping configurations cannot be attested.

$$C_1 = 0.15$$

$$C_2 K_2 = 4$$

$$C_3 = 1.5$$

$$C_4 = 0.7$$

$$C_5 = 1.0$$

$$\text{Sel}/\alpha = 7,690 \text{ psi (53 MPa)}$$

$$V_{\text{allow}} = \frac{(0.15)(0.7)(0.00364)(7,690)}{(1.5)(1.0)(4)}$$

$$V_{\text{allow}} = 0.5 \text{ in./sec (12.7 mm/s)} \text{—screening vibration velocity value}$$

An excerpt from the ASME Code for Operation and Maintenance of Nuclear Power Plants

8 PT. TEXT WITH 10 PT. LEADING

ΣΤΟΙΧΕΙΩΝ Ε΄

ΟΡΟΙ

- α΄ Μέρος εστί μέγεθος μεγέθους το έλασσον του μείζονος, όταν καταμετρή το μείζον.
- β΄ Πολλαπλάσιον δε το μείζον του ελάττονος, όταν καταμετρήται υπό του ελάττονος.
- γ΄ Λόγος εστί δυο μεγεθών ομογενών η κατά ηλικιότητα ποιά σχέσις.
- δ΄ Λόγον έχειν προς άλληλα μεγέθη λέγεται, α δύναται πολλαπλασιαζόμενα αλλήλων υπερέρχειν.
- ε΄ Εν τω αυτώ λόγω μεγέθη λέγεται είναι πρώτον προς δεύτερον και τρίτον προς τέταρτον, όταν τα του πρώτου και τρίτου ισάκεις πολλαπλάσια των του δευτέρου και τετάρτου ισάκεις πολλαπλασιών καθ' οποιονούν πολλαπλασιασμόν εκάτερον εκατέρου ή άμα υπερέρχη ή άμα ίσα η ή άμα ελλείπη ληφθέντα κατάλληλα.
- ς΄ Τα δε τον αυτών έχαντα λόγον μεγέθη ανάλογον καλείσθω.
- ζ΄ Όταν δε των ισάκεις πολλαπλασιών το μεν του πρώτον πολλαπλάσιον υπερέρχη του του δευτέρου πολλαπλασίου, το δε του τρίτου πολλαπλάσιον μη υπερέρχη του του τετάρτου πολλαπλασίου, τότε το πρώτον προς το δεύτερον μείζονα λόγον έχειν λέγεται, ήπερ το τρίτον προς το τεταρτον.
- η΄ Αναλογία δε εν τρισέν όροις ελαχίστη εστί.
- θ΄ Όταν δε τρία μεγέθη ανάλογον η, το πρώτον προς το τρίτον διπλασίονα λόγον έχειν λέγεται ήπερ προς το δεύτερον.
- ι΄ Όταν δε τέσσαρα μεγέθη ανάλογον η, το πρώτον προς το τέταρτον τριπλασίονα λόγον έχειν λέγεται ήπερ προς το δεύτερον, και αι εξής ομοίως, ως αν η αναλογία υπάρχη.

An excerpt from Euclid's Elements, defining concepts of proportion.

10 PT. TEXT WITH 15 PT. LEADING

DANIEL RHATIGAN

*Submitted in partial fulfilment
of the requirements for the
Master of Arts in Typeface Design,
University of Reading, 2007*

