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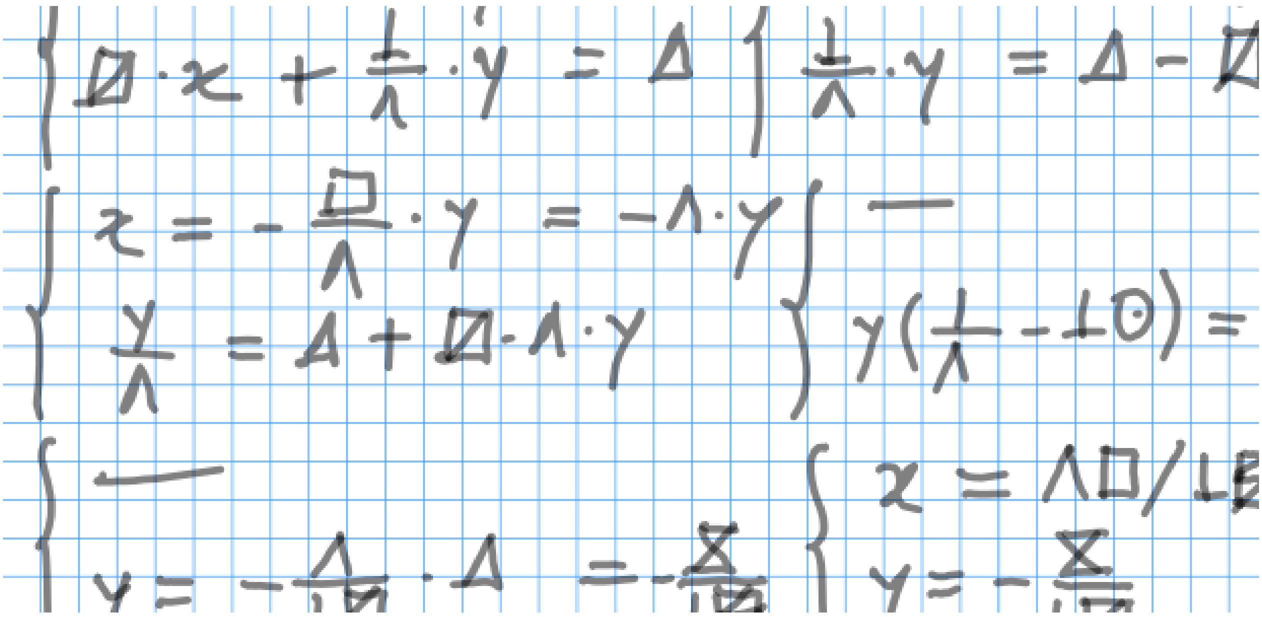
Hyper-numerals, for the Maths and the Sciences of the Future

A new set of symbols



Physics, Engineering, Modelling and Simulation

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ABSTRACT

The 10 based set of symbols presented in this article aims at solving two main challenges related to Maths: a true simplification on the representation and a better understanding of numerals. With this symbols, which I have called *hyper-numerals*, it is expected that not only kids will learn much faster how to represent and operate with numbers, but also our Maths and Sciences will be better understood

by any external civilization that may visit our planet in the future. The secret for such an advance is simple: *hyper-numerals* are symbols constructed based on an intuitive logic.

1. **Introduction**

The history of numbers and number systems is well known and documented. Any visit to the *Wikipedia* will give a fair level of information to anyone interested on the subject. From the ancient systems of numbers to the modern day Arabic-numerals, all that information is available. In each of those systems, however, the *symbols* and the *quantity* which each numeral represents are not obviously and visually correlated. The best approach into such a direction were perhaps the Brahmi-numerals and the Roman-numerals, while representing the first four numbers (1, 2, 3, 4). In general, however, the "*basic quantities*" and the "*symbols representing such quantities*" had nothing to do with each other. Therefore the only way to prepare to work with numbers is to *memorize* a table of *correspondences* between *quantities* and *symbols*, and in parallel to learn how to represent each of those symbols by hand. This frequently turns into a nightmare for certain kids at the first school, as we know, as it will also be a challenge for any civilization that will contact us in the future, and try to understand our Maths, Physics, and systems in general.

On the other hand, *hyper-numerals* (or *h-numerals*) are symbols which include in themselves the idea of the correspondent *quantity*, therefore the previous issues suddenly vanish and both the understanding and the representation of numbers (using the present 10 base) become perfectly clear. I believe *h-numerals* will be the numerals of the future.

2. ***H-numerals*, 10 based.**

Our Maths is already well stabilized and more and more robust, thus the modern 10 base number system is what interests in this case. Here are presented the *h-numerals* corresponding to from 0 to 9 (Fig. 1):

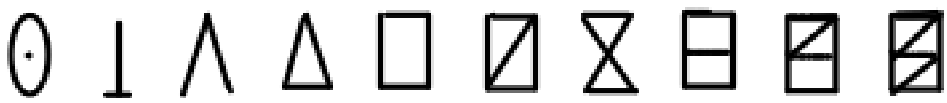


Fig. 1 The symbols of *h-numerals*, from 0 do 9. Notice that they are all created based on the "line" (1), the "triangle" (3) and the "rectangle" (4). The "zero" is maintained as in the Arabic numerals, but with a dot in the middle in order to obviously not to be confused with the letter "O". All the other *h-numerals* can be created by sticks, and the related *quantities* be known by simply counting those sticks. I expect kids to understand and memorizes this in a single day.

H-numeral(0): this symbol is the "*zero*" symbol of the Arabic numerals, but with a dot in its interior for that it will not be confused with the letter "*O*".

H-numeral(1): this symbol is a vertical *stick*. The little line bellow is to be understood as its support, and helps distinguishing it from the letters like "*L*" and "*I*".

H-numeral(2): this symbol is made of 2 sticks, and represents an unfinished triangle. It means 2 = 3 - 1.

H-numeral(3): this symbol is made of 3 sticks. It represents a triangle.

H-numeral(4): this symbol is made of 4 sticks. It represents a rectangle.

H-numeral(5): this symbol is made of 5 sticks. It is a triangle with 1 more diagonal stick. It means 5 = 4 + 1.

H-numeral(6): this symbol is made of 6 sticks. It represents 2 triangles touching each other by a common vertice. It means 6 = 3 + 3.

H-numeral(7): this symbol is made of 7 sticks. It represents a rectangle crossed horizontally by a new stick. Such divides each of the vertical sticks of the rectangle into 2 new sticks, therefore transforming the overall figure into a 7 sticks symbol.

H-numeral(8): this symbol is made of 8 sticks. The seven sticks of the previous *h-numeral(7)* plus a diagonal stick on the upper rectangle. It means 8 = 7 + 1.

H-numeral(9): this symbol is made of 9 sticks. The eight sticks of the previous *h-numeral(8)* plus a diagonal stick on the downer rectangle. It means 9 = 8 + 1 = 7 + 2.

3. **Some examples and exercises**

It is now only necessary to test this system. In this section some examples and exercises[1] are presented. Besides, I would like to challenge everyone to try using *h-numerals* and to add these symbols to the keyboards of their computers, mobile-phones, etc.

1) The example of some volumes:

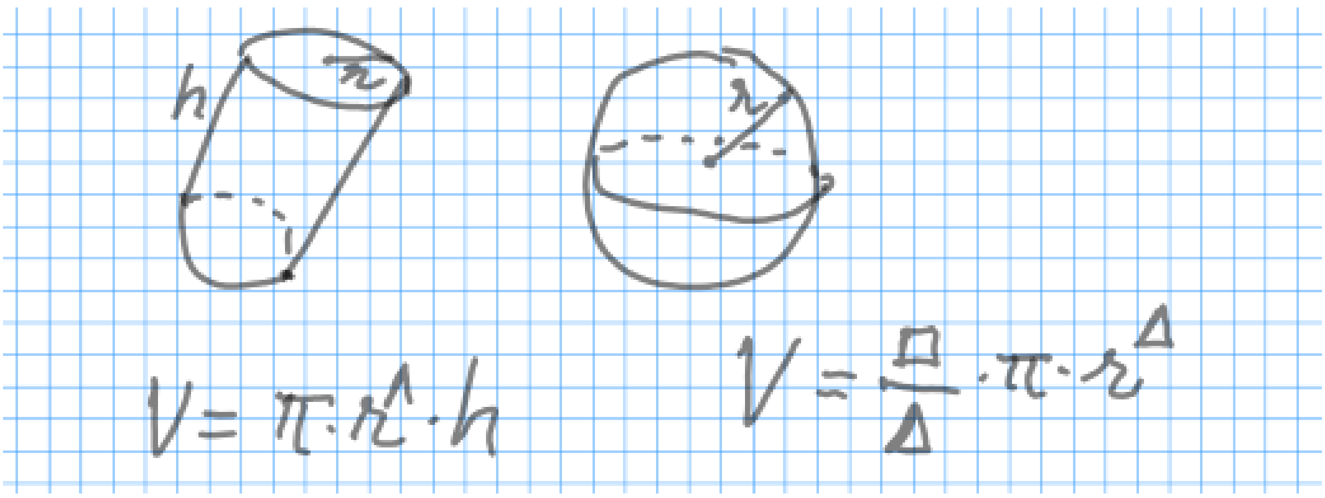


Fig. 2 Using *h-numerals* to express the volume of a cylinder and of a sphere.

[1] Notice that I always use the DOT as the symbol for the *scalar multiplication*, because it allows a very clear writing of equations and formula even when parameters are represented by several characters and numbers. The DOT must always be positioned at the middle level of the operation, of course.

2) About the quadratic equation and its roots:

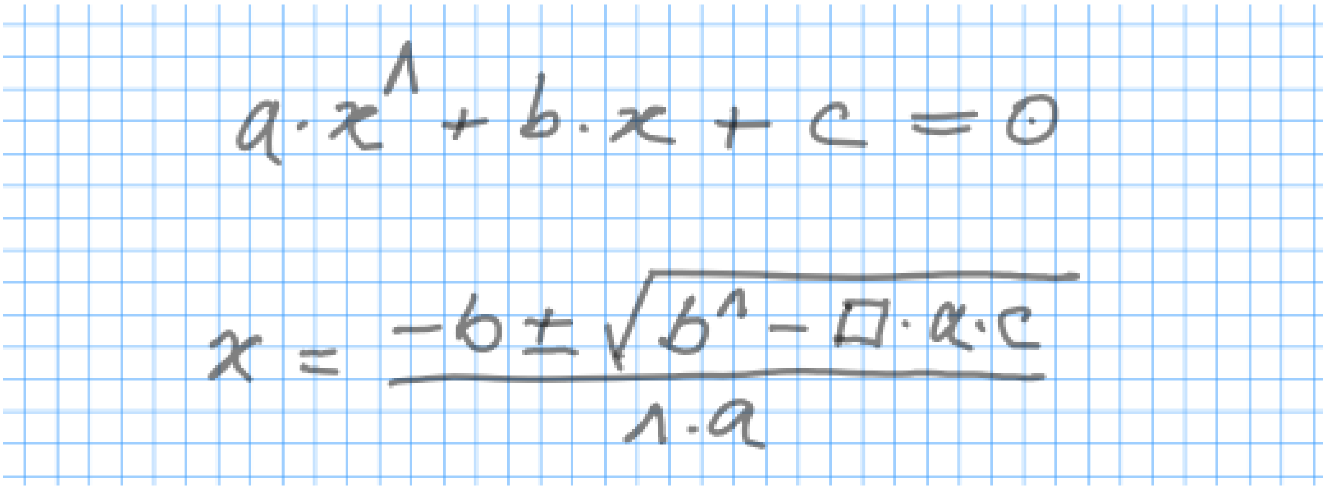
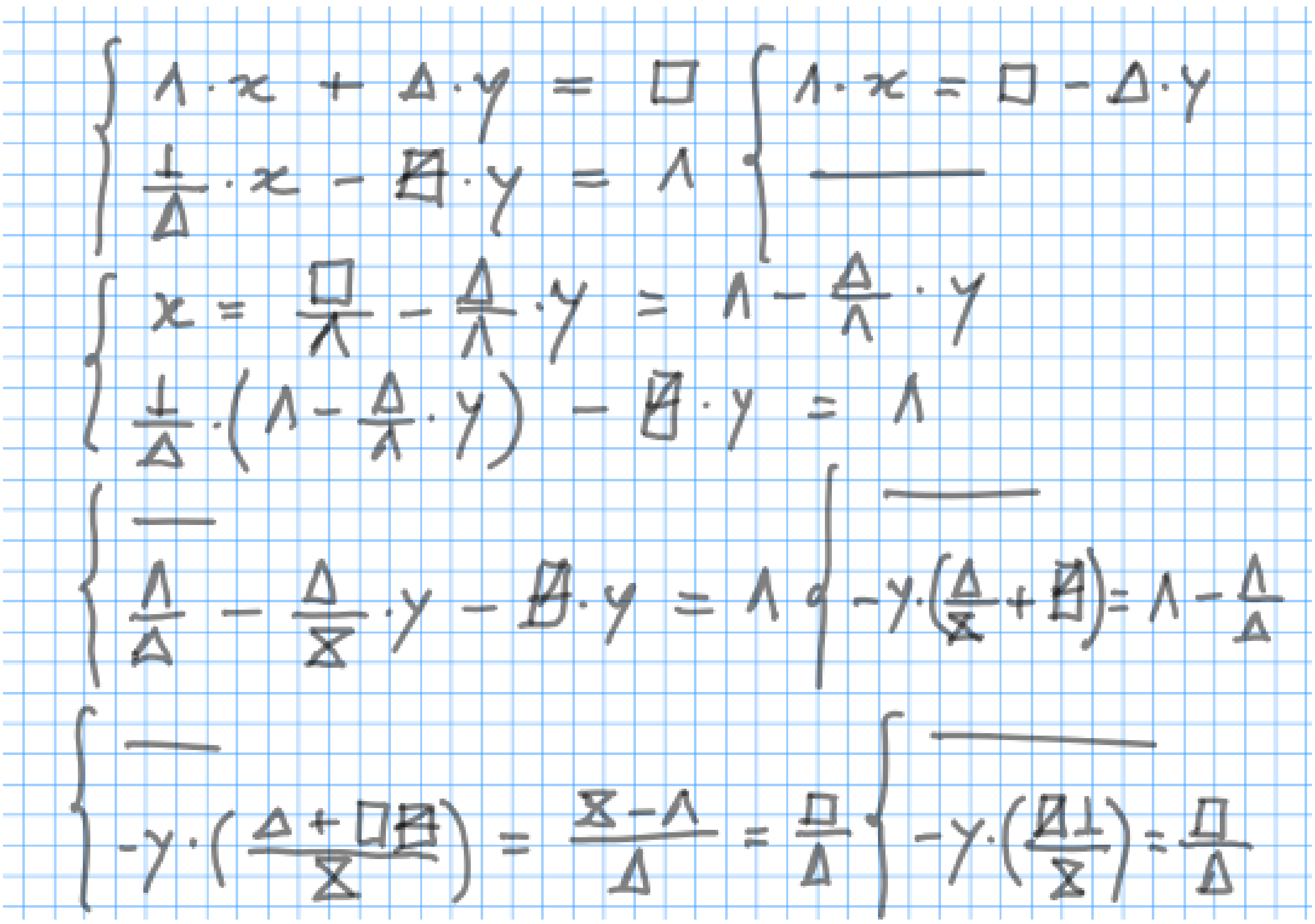


Fig. 3 Using *h-numerals* to represent a quadratic equation and the quadratic formula.

3) Resolving a simple system of linear equations:



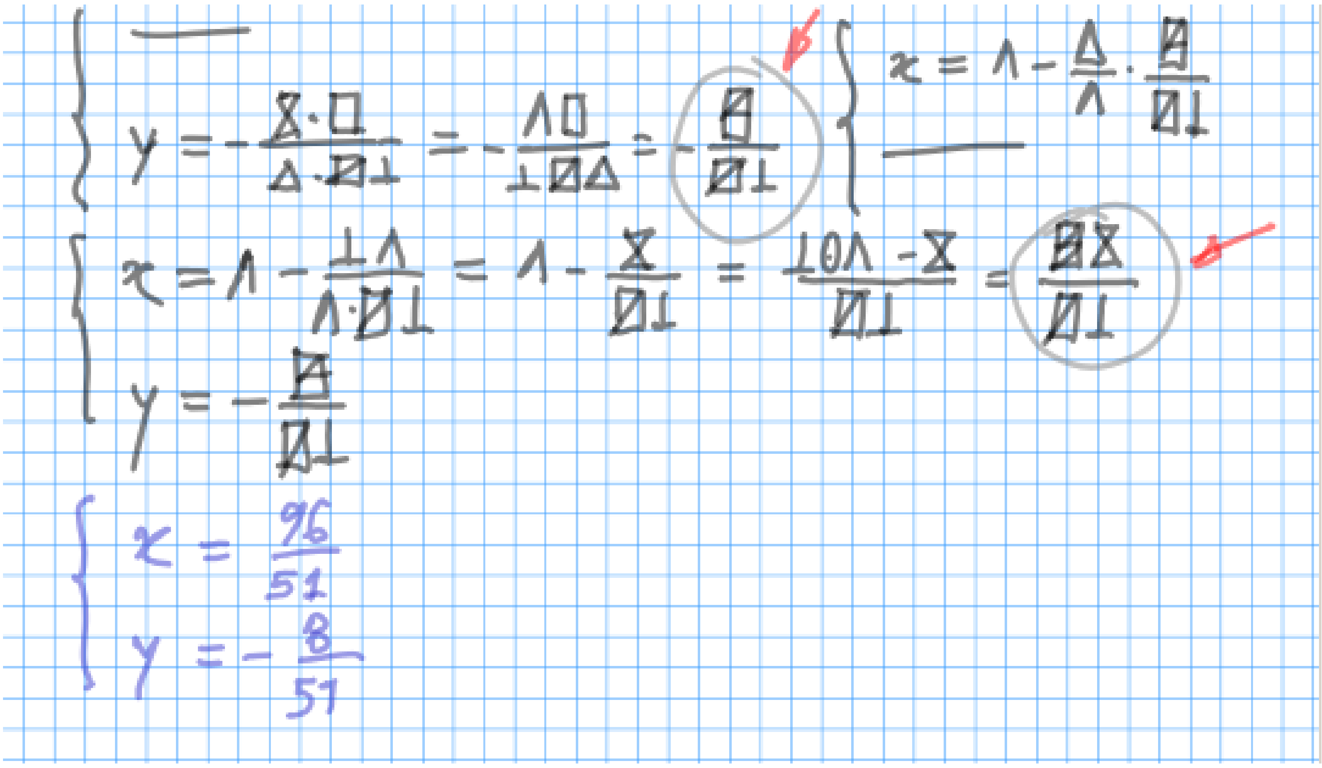


Fig. 4 Using *h-numerals* to resolve a simple system of linear equations.

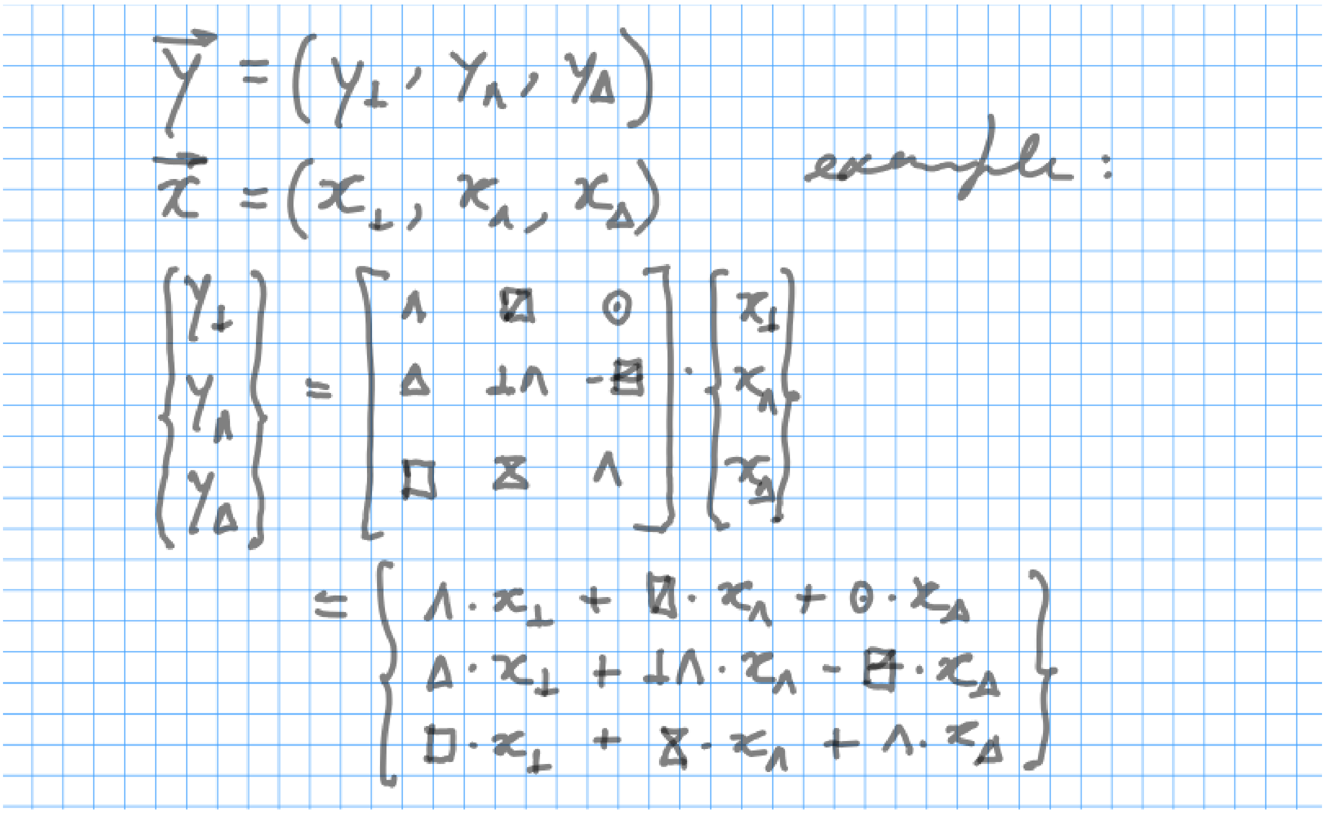


Fig. 5 Example of multiplying a matrix for a vector.

4. **Some conclusions**

As shown in the article, *hyper-numerals* are symbols created based on a very simple logic, what makes them very easy to represent and very easy to understand. These two aspects allows me to suggest they could replace the Arabic numerals, therefore introducing much higher efficiency into our present number system. They will turn the lecturing and the learning of numbers very easy, which is good news for kids in the primary school and for any possible extraterrestrial visitors interested on communicating with us and on understanding our Maths and our Scientific models.

I dedicate this to my father.

Author's Biography:

J. Manuel Feliz-Teixeira, graduated in Physics, Masters in Mechanical Engineering and Doctorate in Sciences of Engineering from the University of Porto. He has been dedicated to various fields of knowledge and several industrial projects. More recently, he became mainly interested in lecturing Physics and studying mainly *electromagnetism* and *gravitation* by means of rethinking classical principles.