THEME 4
NUMBERS IN DIFFERENT LANGUAGES AND CULTURES.

THEME 4 INDEX

4,01

When analysing the numbers in the Bible, it is necessary to understand that the Bible's original text is very old, and part of the stories in the first books, correspond with older legends and stories than the Bible itself, and the numbers in old times were not as the ones we use today.

4,02

At the moment we use the system in base 10 as main numeric system, using 10 numeric characters, and different to the other characters of the alphabet, but it has not always been this way.

There is evidence that numeric systems have been used with base 2; with base 5; with base 7; with base 8, with base 10, with base12; with base 16, with base 20. And with base 60.

4,10 Base 2.

4,10

The system with base 2 is denominated **binary** system, it seems very simple and is perhaps one of the oldest. Now it is used for calculators and computers, Only 2 characters are used that can be 1 and 0; or yes and not; in tapes and perforated records, there is hole or there is not any, In a magnetic support, a point has a positive or negative position, in the electronic process, it happens electricity or not.

It is as the universal law that everything is dual, positive and negative; masculine and feminine etc.

4,11

With 2 characters like 1 and 0 we can write any figure no matter how long it is, as the following equivalences that I indicate, comparing a binary number with base 2 and their equivalent one numbers decimal with base 10.

4,12

In base 2 each figure multiplies or it divides its value for 2 as one runs its position toward the left or toward the right.

Base 10	0	1	2	3	4	5	6	7	8
Base 2	0	1	10	11	100	101	110	111	1000

4,13

111 in base 2 is equal to (1x4) + (1x2)+1 = 7 in base 10.

In computer science each digit in binary is denominated bit that he/she comes from the contracted form of binary and digit.

The following multiples of the bit are usually used:
4 bits forms a quartet or **nibble** (example 1010).
8 bits forms a byte or **byte** (example 10010010) .
1024 bytes =8192 bits form a **kilobyte KB.**
1024 kilobytes form a **megabyte MB.**
1024 megabytes form a **gigabyte GB.**

4,14

a kilobyte KB = 2x2x2x2x2x2x2x2x2x2=1024 bytes.
a megabyte MB = 1024 x 1024= 1.048.576 bytes.
a gigabyte GB=1.048.576 x 1.024 = 1.073.741.824 bytes.

k = 2^{10} = 1 024.
M = 2^{20} = 1 048 576.
G = 2^{30} = 1 073 741 824.
T = 2^{40} = 1 099 511 627 776.
P = 2^{50} = 1 125 899 906 842 624.

4,15

The International Electrotechnical Commission (IEC) chose new binary prefixes in 1998, which consist of placing a 'bi' after the first syllable of the decimal prefix (the binary symbol being the decimal plus an 'i'). So, now a kilobyte (1 kB) is 1000 byte, and a kibibyte = (1 KiB) = 210 bytes = 1024 bytes or bytes. In the same way, a mebibyte = MiB = 220bytes, a gibibyte = 1 GiB = 230bytes, tebi (Ti; 240), pebi (Pi; 250) and exbi (Ei; 260). Although the IEC standard says nothing about it, the following prefixes would reach zebi (Zi; 270) and yobi (Yi; 280). So far the use of the latter has been very scarce.

4,16

Múltiplos de bytes / Multiples of bytes			
Sistema Internacional (decimal) International System		ISO/IEC 80000-13 (binario)	
Múltiplo (símbolo) Multiple (symbol	SI	Múltiplo (símbolo) Multiple (symbol	ISO/IEC
kilobyte (kB)	103	kibibyte (KiB)	210
megabyte (MB)	10^6	mebibyte (MiB)	2^{20}
gigabyte (GB)	10^9	gibibyte (GiB)	2^{30}
terabyte (TB)	10^{12}	tebibyte (TiB)	2^{40}
petabyte (PB)	10^{15}	pebibyte (PiB)	2^{50}
exabyte (EB)	10^{18}	exbibyte (EiB)	2^{60}
zettabyte (ZB)	10^{21}	zebibyte (ZiB)	2^{70}

yottabyte (YB)	10^{24}	yobibyte (YiB)	2^{80}

4,20 Base 5.

4,21

In base 5 each figure multiplies or divides its value for 5 as one runs its position toward the left or toward the right.

Equivalence example among base numbers 10 and base numbers 5 using single 5 characters.

Base 10	0	1	2	3	4	5	6	7	8	9	10
Base 5	0	1	2	3	4	10	11	12	13	14	20

This system in base 5 with 5 characters, has not been used, in the languages and cultures that have used the base 5, they only used 2 characters, 1 and 5 and they repeated the 1 to form the numbers 2, 3 and 4

4,22

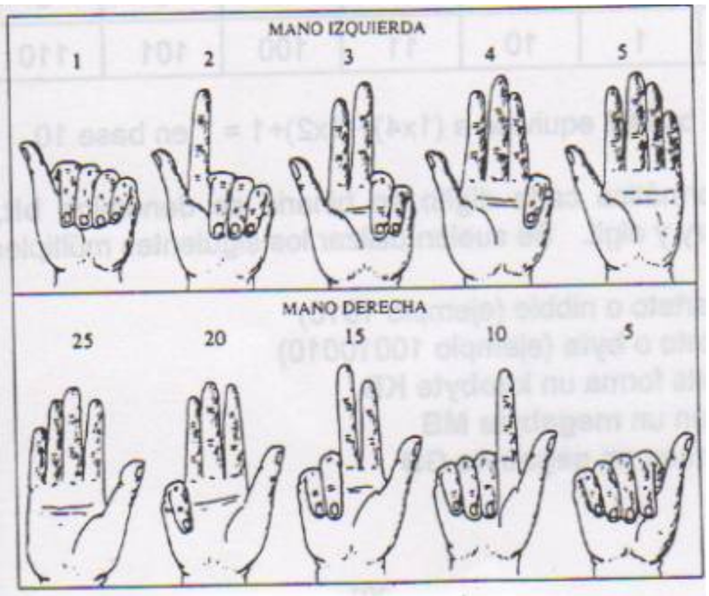
Example of the number 75:

II	IIII	$\overline{\text{IIII}}$		
(2x25)	+(4x5)	+5	=75	

The use of number 5 is formed in an elementary way having the fingers, pointing out with the finger of each hand, each one of the 5 fingers of the other hand.

4,23

Illustration of how we can count from 5 in 5 in base 5 with the fingers


MANO IZQUIERDA
1
2
3
4
5
MANO DERECHA
25
20
15
10
5

4,30 Base 7.

4,31

In base 7 each figure multiplies or divides its value for 7 as one runs its position toward the left or toward the right.

Examples with base 7, using 7 characters:

Base 10	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Base 7	0	1	2	3	4	5	6	10	11	12	13	14	15	16	20

10 in base 7 is equal to 7 in base 10.

4,32

This system in base 7 has not been finally used with 7 numeric characters, but words have been used to define each position in base 7 and at the same time, they used another numeric system.

Among the Indians, in India, they count that during some time, it is possible that they used something similar to base 7 to count the time, but perhaps it is an imaginary legend, because there is not proof that justifies it. As they say, the hour was the unit of time, dividing the day in 7 hours, 4 hours by day but 3 hours of vigil at night they form one day.

4,33

According to the text of Leviticus 23 and 25 the time utilajn the number is counted 7 forming a calendar.

7 days they form one week Leviticus 23:3.
7 weeks form a Pentecost. Leviticus 23:15-16 (7x7+1) = 50 days.
7 Pentecost forms one year.
7 years form a Sabbath year, Leviticus 25:1-7.
and 7 Sabbath years they form a jubilee. Leviticus 25:8-12 (7x7+1) =50 years.

For a schedule of eksa form would work well today, we should add one day every seven weeks, but that day is part of a week, which is not the case, because when the 7th of the 7th week ends, start the day 1 of the following week, on the other hand would need to add 15 holidays or school holidays, when finished 7th until Pentecost st begins the 1st of the new year, (7x7 + 1) x 7 = 350 days + 15 days holiday to complete 365 days, or 16 days of vacation every 4 years to get the leap year 366 days.

4,34

The Hebrew calendar is similar to the one that the Babylonians used, it consists of 12 months, 6 months with 29 days and other 6 with 30 days in an inserted way, in total 354 days, and each two or three years they add one month number 13 with 30 days, in a 19 year-old cycle they have 7 leap years of 13 months that are the years 1 3, 5, 8, 11, 14,16 and 18.

A year has 13 months, call, fraught year.

4,35

In the lunar translational motion, the Moon moves eastward from Earth.
The fact that the moon comes out about 51 minutes later each day knowing explains the orbit of the Moon around the Earth.

The Moon completes one revolution around the Earth approximately in about 28 days. If the Earth did not rotate on its axis, and the moon will continue circling the Earth at the same speed and direction, which would be the moon crossing from west to east for two weeks and then be absent two weeks during Moon which would be visible on the opposite side of the Earth.

4,36

The direction of rotation of the Earth is also east). From the point of view of the Earth's surface, it seems that the moon moves westward.

The lunar month is the time it takes the moon to move from one phase to another similar New Moon New Moon, lasts 29 days, 12 hours, 44 minutes and 2.81 seconds, = (29.53 days). 12 lunar months = approximately 354.40 days.

4,37

For more information it has more than enough Hebraic calendar or Jewish calendar, pages web can be consulted, I eat the following ones for example:

http://es.wikipedia.org/wiki/calendarioebreo

http://www.libreriahebraica.com/catalog/infover.php

http://www.es.chabad.org/

http://www.chabad.org/calendar/

http://www.hebcal.com/

4,38

A Buddhist legend in India tells that they used something similar to the base 7 like a longitude measure unit, taking a grain of powder of elementary atom as a unit.

7 grains of powder of atom simple = a grain of very fine powder .
7 grains of very fine powder = a grain of fine powder.
7 grains of fine powder = a powder grain moved by the wind.
7 powder grains moved by the wind, = a powder grain lifted by a hare.
7 powder grains lifted by a hare, = a powder grain lifted by a ram.
7 powder grains lifted by a ram = a powder grain lifted by a cow.
7 powder grains lifted by a cow = a grain of Poppy.
7 poppy grains = a grain of mustard.
7 grains of mustard = a barley grain.
7 barley grains = a finger phalange.

Starting from the finger they already leave number 7.

12 fingers = a span, 2 spans = an elbow. and they continue lengthening the measure units without using the 7.

Finger	Barley	mustard	poppy	Powder cow	Powder ram	Powder hare	Powder wind	Powder thin	Powder thin	Powder atom
=	7 x	7 x	7 x	7 x	7 x	7 x	7 x	7 x	7 x	7 x

Finger= = 282.475.249 grains of powder of atom simple.

4,40 **base** 8.

4,41

It is denominated **octal** system, it uses 8 symbols to represent any quantity. These symbols are:
0 1 2 3 4 5 6 7.

It is used for the programming of the computers. Each **octal** figure is equal to 3 binary digits, as the following example:

Octal	0	1	2	3	4	5	6	7
Binary	000	001	010	011	100	101	110	111

4,42

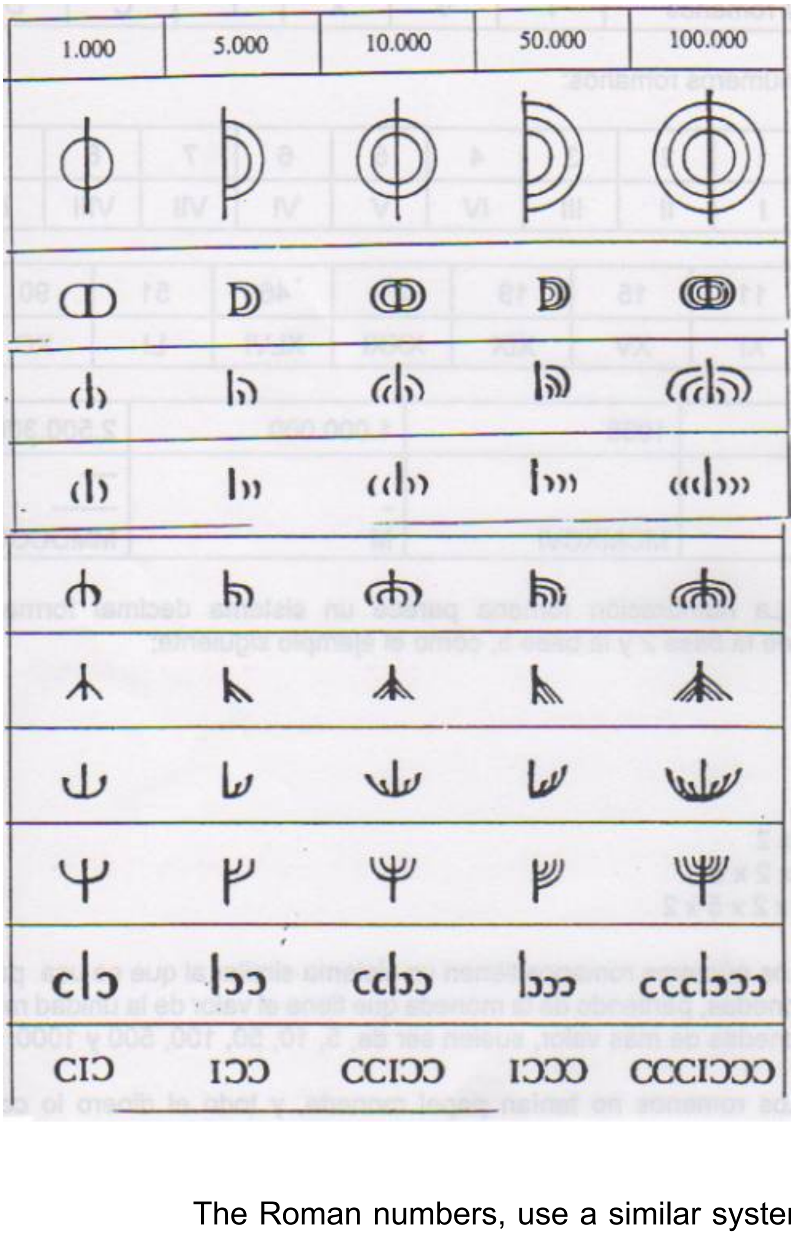
Greek numbers.

The Greek numbers have been formed among the years 500 to 1 a.e.c. in a similar way to the Roman numbers, as we can see in the following illustrations:

4,50 Roman numbers.

4,51

Evolution of the graphic representation of old Roman numbers for 1000, 5000, 10.000, 50.000, and 100.000



The Roman numbers, use a similar system to base 10, it is not base 10, and it is not a positional system, but we could tell base 10 in a period of formation of the base, they use as characters 7 letters of the alphabet and a horizontal line for the thousands above the letters, each line added multiplies again for 1000, 2 lines are millions etc.

4,52

The Romans didn't use the 0.

Equivalence among Arab and Roman numbers:

Current Arab numbers	1	5	10	50	100	500	1000
Roman Numbers	I	V	X	L	C	D	M

Examples of Roman numbers:

Arab	1	2	3	4	5	6	7	8	9	10
Roman	I	II	III	IV	V	VI	VII	VIII	IX	X

Arab	11	15	19	31	46	51	90	106
Roman	XI	XV	XIX	XXXI	XLVI	LI	XC	CVI

Arab	1996	1.000.000	2.500.300
Roman	MCMXCVI	- M	------- MMDCCC

4,53

The Roman numeration seems a decimal system formed by the combination of the base 2 and the base 5, as the following example:

I = 1.
V = 5.
X = 5 x 2.
L = 5 x 2 x 5.
C = 5 x 2 x 5 x 2.
D = 5 x 2 x 5 x 2 x 5.
M = 5 x 2 x 5 x 2 x 5 x 2.

Roman numbers have a similar system to which is used to count the money currencies, taking the currency that has the value of the monetary unit, the following currencies of higher value are usually of, 5, 10, 50, 100, 500 and 1000.

4,54

The Romans didn't have paper currency, and all the money they count were metallic currencies. Still at the present time, most of the calculations are made to count money preferably.

The Romans didn't use the 0, because zero means nothing, and if there is not anything to count, a character like that is not needed, and we begin to count starting from one. But in other parts, like in Babylon, it is already known the use of the 0 by the century IV a.e.c. In India and China for the century I a.e.c.

When using 7 letters to write a numeric system in base 10, it is necessary to use several letters to represent some of the figures, repeating a letter, or adding or subtracting to a letter, another of less value, up to three times like maximum. It is as if a figure was formed by several bits, like in the binary system, to form a byte, and to facilitate the reading it would be more comfortable to separate with each group of letters with a dash, although that rule does not exist. As the following example, to write the date of the year 1996.

4,55

1 9 9 6 M-CM-XC-VI					

MCMXCVI is equal at 1000+900+90+6 and it is almost like in base 10 (1x1000)+(9x100)+(9x10)+6.

Roman numbers are still used for some things, for example, to indicate the ordinal number of a king, for example, XII Alfonso. And also in clocks of 12 hours with handcuffs, to conserve the old style of the clocks. In some clocks the I number are written with 4 letters IIII, in an exceptional way to the general norm that is IV.

4,56

Comparing o'clock, Roman numerals between 12 hour and Arabic numerals with 24-hour clock.

In the morning

XII	I	II	III	IV	V	VI	VII	VIII	IX	X	XI
00	01	02	03	04	05	06	07	08	09	10	11

In the evening

XII	I	II	III	IV	V	VI	VII	VIII	IX	X	XI

12	13	14	15	16	17	18	19	20	21	22	23

The minute Roman numerals to indicate multiplicand for 5 minutes with current numbers. For example:

When the long handle of the clock pointed to (I) in Roman numerals, equivalent to 5 minutes. When the long handle pointing to (IX) in Roman numerals, is 45 minutes.

When the long handle points to the number (IX) in Roman numerals, it equals 45 minutes.

In the morning, hours and minutes, in the second row the minutes are indicated, multiplying by 5 the number that marks the long handle of the minute hand.

4,57

In the morning, hours and minutes

XII:I	I:III	II:VI	III;IX	IV:X	V:XI	VI:II	VII:III	VIII:IV	IX:V	X:IV	XI:VIII
XII:V	I:XV	II:XXX	III:XLV	IV:L	V:LV	VI:X	VII:XV	VIII:XX	IX:XXV	X:XX	XI:XL
00:05	01:15	02:30	03:45	04:50	05:55	06:10	07:15	08:20	09:25	10:20	11:40

In the afternoon, hours and minutes

XII:I	I:II	II:III	III:IV	IV:V	V:VI	VI:VII	VII:VIIII	VIII:IX	IX;X	X:XI	XI:II
XII:V	I:X	II:XV	III:XX	IV:XXV	V:XXX	VI:XXXV	VII:XL	VIII:XLV	IX:L	X:LV	XI:X
12:05	13:10	14:15	15:20	16:25	17:30	18:35	19:40	20:45	21:50	22:55	23:10

In some Bibles, like in recent translations of the Greek version of the LXX, the Roman numbers are used to indicate the number of the chapter, and the number of verse is written with Arab numbers. And it is also written with Roman numbers.

The number of order of the books, for instance: II Kings.

The numbers in the text of the Bible always appear written in letter, in all the languages.
The statement of a text can be this way: for Kings 6:1 it is written III Kings VI:1. Keeping in mind that 1º and 2º of Samuel, in that Bible they are I and II of Kings and 11 and 21 of Kings are III and IV of Kings

4,58

Negative numbers, are more modern. If zero is nothing, less than zero is less than nothing; And to still complicate it more, if we multiply two negative numbers, instead of resulting a negative number but bigger, gives a positive result.

Example:

-2 for -2 = +4	-4 / -2 = +2	with spreadsheet	=-2*-2 gives 4
+2 por +2 = +4	+4 / +2 = +2		= -4/-2 gives 2

In real practice, to multiply two negative numbers is rarely given; For example nobody has two negative bills in the bank, with debts. The number of bills is any or some in positive. Because if there were negative bills we would say: -2 bills for -2 in each bill = +4 pts

We cannot multiply or divide for zero, because it is equal to multiply or to divide for anything, and however it can multiply and divide for less than zero that is equal to multiply and to divide for less than anything. If we try to make an operation of dividing for zero with the computer, it gives us an error message. And a wrong desire for another person is to tell him; multiply yourself for zero that is equal to tell him, become nothing.

The zero was brought to Spain by the Arab, which were in Spain among the years 711 at the 1492, e.c. and they copied the zero from other countries, it is said that from India they brought the zero to Spain in the century X. For the Hindu the zero meant hole, or vacuity, being able to use in the numbers to occupy vacant spaces, to know the position that the other figures occupy, in such a way that for example one followed by four zeros, has a superior value to one, because the one occupies the quarter position, counting from the right, 1000.

The value of each figure due to the position that occupies, discovered it in different places of the planet and in different dates, without one can know with certainty who has copied to one another. The Indians from India and Chinese already used a bit earlier our era.

For the Mayan among the centuries IV and IX e.c.

In India and China the numbers were already used from the 1 to the 9 and the 0 in the century IV e.c. in what we call base 10. In the century X e.c. it was introduced in Spain the base system 10 with 10 numeric characters, and previously it was used in Spain the similar Roman system to base 10 using 7 letters of the alphabet and a line for the thousands.

The Romans already used partially the base 10, when making many operations related with groupings of 10, multiples and dividing of 10. He exercises the they had divided in military groups of 100 with a century boss, each 10 centuries formed a thousand, a legion used to have 1000 military, or multiple of 1000, as 2000 or 3000 up to 60 centuries = 6.000 soldiers.

4,59

The Roman calendar consisted on dividing the year in 10 months. 4 months with 31 days and the other ones 6 with 30 days

The current months of September, October, November, and December correspond with the months 7º,8º,9º, and 10º.

The king Numa added 2 months but, the current January with 29 days and February with 28 days.

After several reformations, during Julio's Cesar command and Augusto Cesar, we arrived to the current calendar of 12 months with 365 days among the years 48 a.e.c. to the 14 e.c. Julio's months and August have the names of the emperors Julio Cesar and Augusto Cesar when being distributed the 365 days of the year, and 366 the leap years every 4 years, among 12 months, they correspond in an alternative way a month of 31 days, followed by another of 30, if you begin with 31 days the first month, the odd months they would have 31 days and the couples 30 days.

As the month of Julio is odd, it corresponds it 31 days and 30 days to the month of August, but the emperor Augusto, said that the month that takes his name couldn't have less days than the one that it takes Julio's Cesar name, and they set 31 days, changing the order so that starting from August the odd months they have 30 days, and the couples 31 days, having more than enough one day that they took off to the month of February, leaving it in 29 days the years leap, and only 28 days the other years.

The Pope XIII Gregorio made another reformation, advancing 10 days the date of the calendar, so that the day October of 1582 becomes 5 the day October 15 1582. Later on this calendar for the French republican government in the year 1793 adapting it a little to the decimal system, so that the weeks had 10 days, the days had 10 hours, every hour 100 minutes and every minute 100 seconds, but hard little this reformation, with government's change one returns again to the previous calendar.

The Roman system is a continuation of the Greek system, which was evolving from the century V to the I a.e.c. The graphic form of the Greek characters is different from the Roman numbers, and the Greeks used the addition system, forming each I number with the sum of several figures, and some figures, formed with the sum of several characters, but they didn't form a figure subtracting a character of other, like in the Roman system.

The graphic form of the Roman characters, is also an evolution in the graphic way of the oldest characters that with the time, they were equaled to the form of the Latin letters.

4,60 ABACUS.

4,61

The abacus is an instrument of calculation of Chinese origin, the first instrument was first used toward the year 2.637 a.e.c. AND with the course of the time its use extended to other parts of the world, changing model and the name, in Greek is called ábax, in Latin it is called abácus of where the name Spanish abacus proceeds. In Greece and in Egypt it was already used in the century I SAW a.e.c.

The following is an example I give similar abacus to which the Romans used toward the century II e.c.

4,62

O	O	O	O	O	O	O		O	O	O	O			
							V					**O**	**O**	**O**
-	-	-						-	-	-				
M	C	X	M	C	X	I		M	C	X	M	C	X	I
								O	**O**	**O**	**O**		**O**	**O**
O	O	O	O	O	O	O	I		**O**	**O**	**O**	O		**O**
O	O	O	O	O	O	O		O		**O**	**O**	O	O	
O	O	O	O	O	O	O		O	O		**O**	O	O	O
O	O	O	O	O	O	O		O	O	O		O	O	O

Position initial	**Number**	**1**	**2**	**3**	**4**	**5**	**6**	**7**

The records above are worth 5 and those below are worth 1 each one.

4,70 base 10.

4,71

The base 10 is the one that we use the most nowadays, it is called decimal system. 10 numeric characters are used, the punctuation signs and mathematical symbols. For many people it is the only numeric system that exists, because they don't know another system.

For those who don't know other numeric bases, the numeric system with base 10 is the only one that exists, and the numeric systems with a different base to 10, are nonsense.

The value of each figure is positional, increasing or diminishing for 10 the value of each figure as one runs the position of the decimal comma toward the left or toward the right.

Example:
1996 = (1x1000)+(9x100)+(9x10)+6.

It is possible that the decimal system has its origin in India.
In the different regions of India, they draw the numbers with a different graph, the graphic form that we have in Spain is the one that the Arab brought, and they are called Arab numbers.

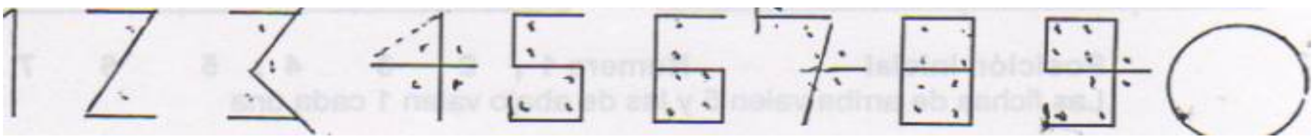
The negative numbers were used in India and China from the century V, e.c. and to western Europe they arrived toward the year 1484 e.c.

Different European mathematicians have written ideas about the origin the graphic shape of the Arab numbers. These theories, are not in other countries occupied by the Arab, which seems characteristic of the European authors. One of these theories is the following one:

4,72

Each number 1 to 9 is formed by angles. The 1 has an angle, the 2 have 2 angles, the 3 have three angles and this way up to 9, and the 0 doesn't have angles, in the following way.

1	2	3	4	5	6	7	8	9	0



Imaginational can make us think many causes which motivated the graphic formation of the numbers, it should be also taken into account that the shape is changing as the time goes by, and to see its origin, a historic research must be done on how the graphic shape of numbers has evolutioned.

4,73

Absolute value	1	2	3	4	5	,	6	7	8	9	0
	1	2	3	4	5	,	6	7	8	9	0
Relative value	10000	2.000	300	40	5		0,6	0,07	0,008	0,0009	0

In the English system, instead of writing coma “,” for the decimals, they write point”.” and for the separation of the thousands instead of writing a point ”.” they write a coma “, ” and that's how the numbers result in the computers and calculators, with the English system.

To multiply a number for the base, one runs the comma one position to the right, in the example number, multiplying for 10 the comma is placed between the 6 and the 7, and if there are not any numbers left to the right a zero every time is placed that multiplies for the base 10.

To divide one number for the base, one runs the comma one position to the left, in the number of the example, when dividing for 10 the comma is placed between the 4 and the 5, and if there are not any numbers left to the left, a zero is set every time that is divided that number for the base, so that it is a zero to the left of the comma, and all the zeros that are placed mark the relative position of the whole numbers with regard to the comma,

4,74

Among the writings of a mathematician from India you can point out as something curious, the numbers 12345654321, as a result of multiplying 111.111 x 111.111. The result is number that they call **palindrome** that consists in that it is read the same from of left to right and from right to left, and among these numbers I indicate next some numbers we can get as something curious.

1^2	=	1	11^3	=	1331
11^2	=	121	111^3	=	1367631
111^2	=	12321	11^4	=	14641
1111^2	=	1234321	101^2	=	10201
11111^2	=	123454321	1001^2	=	1002001
111111^2	=	12345654321	10001^2	=	100020001
1111111^2	=	1234567654321	101^3	=	1030301
11111111^2	=	123456787654321	1001^3	=	1003003001
111111111^2	=	12345678987654321	10001^3	=	1000300030001
1111111111^2	=	1234567890987654321	101^4	=	104060401
			1001^4	=	1004006004001
			202^2	=	40804

The other interesting case is the so called legend of Sesa. It is told that in an occasion a Hindu Brahmin gave an Indian king, a game of Chaturanga, a game similar to chess. The happy king with the gift told the Brahmin to ask him everything he wanted, the Brahmin asked the king to give him a wheat grain for the first square of the board, 2 grains for the second square, 4 grains for the third square, and so forth duplicating the wheat grains for each square, up to the 64 squares that the board of the game has.

The king told him that he could ask him more because with all that the one has it is very little what he has requested him, but the Brahmin said it was enough.

The king ordered the mathematicians to tosse the bill of the wheat grains that it was necessary to give him and after many delays, a mathematical sage told the king that the operation is 2 high at 63 in the square 64
128x256x256x256x256x256x256x256 the sum is:
1+2+4+8+16+... =18.446.744.073.709.551.615 grains
Similar to 2^{64} -1

More wheat than all that is produced in the whole World during the King's lifetime. About 100.000.000.000 cubic meters of wheat. The king asked him how he could pay that, and the mathematical sage told him that he told the Brahmin that counted one by one all the grains, and in that way he couldn't take much quantity, perhaps he could count one grain per second 3600 per hour, and in that way it is little quantity he could take, it would not be more than 1 litro = 1 dm^3 per day, less than 0,4 m^3 cubic meters per year.

4,75

1	2	2^2	2^3	2^4	2^5	2^6	2^7
2^8	2^9	2^{10}	2^{11}	2^{12}	2^{13}	2^{14}	2^{15}
2^{16}	2^{17}	2^{18}	2^{19}	2^{20}	2^{21}	2^{22}	2^{23}
2^{24}	2^{25}	2^{26}	2^{27}	2^{28}	2^{29}	2^{30}	2^{31}

2^{32}	2^{33}	2^{34}	2^{35}	2^{36}	2^{37}	2^{38}	2^{39}
2^{40}	2^{41}	2^{42}	2^{43}	2^{44}	2^{45}	2^{46}	2^{47}
2^{48}	2^{49}	2^{50}	2^{51}	2^{52}	2^{53}	2^{54}	2^{55}
2^{56}	2^{57}	2^{58}	2^{59}	2^{60}	2^{61}	2^{62}	2^{63}

4,76

The multiples and divisors of the units of measurement in the decimal system increase and decrease by 10 in 10. The names of the multiples are formed by prefixing the name of the corresponding unit with the following Greek words:

Miria	which means	10,000			
Kilo	which means	1,000			
Hekto (Hecto)	which means	100			
Deka (Deca)	which means	10			

The names of the divisors are formed by prefixing the name of the corresponding unit with the following Latin words.

Deci	which means	one tenth part	0.1
Centi	which means	one hundredth part	0.01
Mili	which means	one thousandth	0.001

Table of multiples and divisors of some measures in decimal system

Miria = 10.000	Miriametro Mm = 10.000m	Miriagramo Mg = 10.000g	Mirialitro Ml = 10.000 L
Kilo = 1.000	kilómetro Km = 1.000m	kilogram Kg = 1.000g	Kilolitre Kl = 1.000 L = $1m^3$
Hekto = 100 (Hecto)	Hektometro Hm= 100m (Hectometro), (hectometre)	Hektogramo Hg = 100g (Hectogramo), (hectogram)	Hektolitro Hl = 100 L (Hectolitro), (Hectolitre)
Deka = 10 (Deca)	Dekametro Dm= 10m Decametro), (decameter)	Dekagramo Dg = 10g (Decagramo), (decagram)	Dekalitro Dl = 10 L (Decalitro), (decilitre)
Unidad = 1	metro, (meter) = m	gramo, (gram) = g	Litro, (liter) = L = 1 dm^3
deci = 0,1	decímetro dm = 0,1m	decigramo dg = 0,1g	decilitro dl = 0,1 L
Centi = 0,01	centímetro cm = 0,01m	centigramo cg = 0,01g	centilitro cl = 0,01 L
mili = 0,001	milímetro mm = 0,001m (millimetre)	miligramo mg = 0,001g (milligram)	mililitro ml = 0,001 L= 1 cm^3 (millilitre)

4,77

Also used the small measure of **micro**, from the Greek **mikrón**, in length is one thousandth of a millimetre, equal to **mikrometro** (**micrometre),** 0,000001 metro.

The word **micro**, is also used for small things like microbe, And micro particles of dust.

One kilogram, = 1kg, is equivalent to the weight of 1 liter = 1L = 1dm3,,. Of distilled water at sea level.

A metric ton, is the weight of 1 cubic meter, of distilled water at sea level, = 1 kilolitre = 1Kl = 1.000L = 1m3 = 1Tm. = 1.000 kg.

In other measurement systems other than the decimal metric system, one tonne is the capacity and weight of a barrel, with different measures, depending on the system of measurements.

The prefixes of the International System are used to name the multiples and submultiples of any SI unit, whether basic or derived units.

These prefixes are prefixed with the unit name to indicate the multiple or decimal submultiple of the unit; Likewise, the symbols of the prefixes are placed before the symbols of the units.

The prefixes belonging to the SI are officially established by the International Bureau of Weights and Measures (Bureau International des Poids et Mesures), according to the following table:

4,78

1000^n	10^n	Prefijo	Símbolo	Escala corta	Escala larga	Equivalencia decimal en los Prefijos del Sistema Internacional	Asignación
1000^8	10^{24}	Yotta	Y	Septillon	Cuatrillón	1 000 000 000 000 000 000 000 000	1991
1000^7	10^{21}	Zetta	Z	Sextillon	Mil trillones	1 000 000 000 000 000 000 000	1991
1000^6	10^{18}	Exa	E	Quintillon	Trillón	1 000 000 000 000 000 000	1975
1000^5	10^{15}	Peta	P	Cuatrillon	Mil billones	1 000 000 000 000 000	1975
1000^4	10^{12}	Tera	T	Trillón	Billón	1 000 000 000 000	1960
1000^3	10^9	Giga	G	Billon	Mil millones / Millardo	1 000 000 000	1960
1000^2	10^6	mega	M	Millon		1 000 000	1960
1000^1	10^3	Kilo	K	Mil / Millar		1 000	1795
$1000^{2/3}$	10^2	hecto	H	Cien / Centena		100	1795
$1000^{1/3}$	10^1	Deca	Da	Diez / Decena		10	1795
1000^0	10^0	No prefix		Uno / Unidad		1	
$1000^{-1/3}$	10^{-1}	Deci	D	Decimo		0.1	1795
$1000^{-2/3}$	10^{-2}	Centi	C	Centesimo		0.01	1795
1000^{-1}	10^{-3}	Mili	M	Milesimo		0.001	1795
1000^{-2}	10^{-6}	micro	µ	Millonesimo		0.000 001	1960
1000^{-3}	10^{-9}	Nano	N	Billonesimo	Mil millonésimo	0.000 000 001	1960
1000^{-4}	10^{-12}	Pico	P	Trillonesimo	Billonésimo	0.000 000 000 001	1960
1000^{-5}	10^{-15}	femto	F	Cuatrillonesimo	Mil billonésimo	0.000 000 000 000 001	1964
1000^{-6}	10^{-18}	Atto	A	Quintillonesimo	Trillonésimo	0.000 000 000 000 000 001	1964
1000^{-7}	10^{-21}	zepto	Z	Sextillonesimo	Mil trillonésimo	0.000 000 000 000 000 000 001	1991
1000^{-8}	10^{-24}	yocto	Y	Septillonesimo	Cuatrillonésimo	0.000 000 000 000 000 000 000 001	1991

4,79

In the Spanish-speaking countries the long scale is mostly used, while in the Anglo-Saxon countries the short scale is mostly used.

These prefixes are not exclusive to the SI. Many of them, as well as the very idea of using them, predate the establishment of the International System in 1960; Therefore, they are often used in units that do not belong to the SI.

4,80 base 12.

4,81

In base 12 the value of each figure multiplies or it divides for 12 as one runs its position toward the left or toward the right. In such a way it is usual to count for dozens and the units of weights, longitude and currencies had multiples and divisions of 12. **Duodecimal** system can be said.

The use of this system in Europe, and in Mesopotamia, before the Greek numeric system, and some vestiges of that system have arrived until our days.

In measures of longitude in Europe, a foot had 12 inches, an inch 12 lines, and a line 12 points.

In Mesopotamia, 1 ninda = 12 elbows (measure of longitude).
1 sar = 12 x 12 square elbows (surface measure.

The duration of the day was divided in 12 parts called dannas, corresponding to the 24 current hours. 1 danna=2 hours.

The circle, the elliptic one and the zodiac were divided in 12 sectors of 30 degrees.

If now we want to compare the base 12 with the base 10 that we have at the moment, the numeric characters of the base 10 they can be used and add 2 letters to complete the 12 numbers like I indicate next:

4,82

Base 10	0	1	2	3	4	5	6	7	8	9	10	11
Base 12	0	1	2	3	4	5	6	7	8	9	A	B

The numeric system in base 12 have been left in the tradition so that we keep on counting dozens, for example, eggs, flowers, churros, plates, glasses, cutleries and many other things are sold in dozens.

In some schools children are taught the **multiplication table up to 12**, as I show in the following chart:

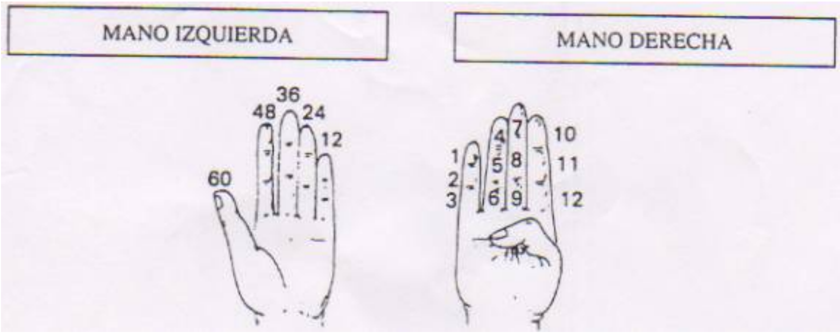
4,83

Multiplication table.

1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
2	4	6	8	10	12	14	16	18	20	22	24
3	6	9	12	15	18	21	24	27	30	33	36
4	8	12	16	20	24	28	32	36	40	44	48
5	10	15	20	25	30	35	40	45	50	55	60
6	12	18	24	30	36	42	48	54	60	66	72
7	14	21	28	35	42	49	56	63	70	77	84
8	16	24	32	40	48	56	64	72	80	88	96
9	18	27	36	45	54	63	72	81	77	99	108
10	20	30	40	50	60	70	80	90	100	120	120
11	22	33	44	55	66	77	88	99	110	121	132
12	24	36	48	60	72	84	96	108	120	132	144

The number 12 can be formed counting with one hand and marking with the thumb each one of the phalanges of the other 4 fingers, and it can also be counted in dozens, up to 60, as I indicate next:

4,84



4,90 base 16.

4,91

In base 16, 16 characters are used with value from 0 to 15, replacing the numbers with letters from 10 to 15. This system is used in the programming of the computers, and it is called **hexadecimal** system, with the following equivalence in comparison to the decimal system.

Base 10	0	1	2	3	4	5	6	7	8	9	10
Base 16	0	1	2	3	4	5	6	7	8	9	A
Base 10	11	12	13	14	15	16	17	18	19	20	21
Base 16	B	C	D	E	F	10	11	12	13	14	15
Base 10	22	23	24	25	26	27	28	29	30	31	32
Base 16	16	17	181	19	1A	1B	1C	1D	1E	1F	20

1E in base 16 is equal to (1x16)+(1x14) = 30 in base 10.

4,92

A figure in hexadecimal, is equal to 4 digits in binary, as the following example, showing the equivalence of the figures in several positional numeric systems:

Binario base 2 (Binary)	base 4(2^2)	Octal base 8 (2^3)	Decimal, base 10	Hexadecimal, base 16 (2^4)
0	0	0	0	0
1	1	1	1	1
10	2	2	2	2
11	3	3	3	3
100	10	4	4	4
101	11	5	5	5
110	12	6	6	6
111	13	7	7	7
1000	20	10	8	8

0001	21	11	9	9
1010	22	12	10	A
1011	23	13	11	B
1100	30	14	12	C
1101	31	15	13	D
1110	32	16	14	E
1111	33	17	15	F

The characters of writing of the computer programmes, are not usually seen on screen during the execution of the programme. To see it, it is necessary utility programmes, as for example "Utilities Norton".

4,93

Hexadecimal multiplication table from 1 to F.

1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**A**	**B**	**C**	**D**	**E**	**F**
2	4	6	8	A	C	E	10	12	14	16	18	1A	1C	1E
3	6	9	C	F	12	15	18	1B	1E	21	24	27	2ª	2D
4	8	C	10	14	18	1C	20	24	28	2C	30	34	38	3C
5	A	F	14	19	1E	23	28	2D	32	37	3C	41	46	4B
6	C	12	18	1E	24	2A	30	36	3C	42	48	4E	54	5A
7	F	15	1C	23	2A	31	38	3F	46	4D	54	5B	62	69
8	10	18	20	28	30	38	40	48	50	58	60	68	70	78
9	12	1B	24	2D	36	3F	48	51	5A	63	6C	75	7F	87
A	14	1F	28	32	5B	46	50	5A	64	6E	78	92	8B	96
B	16	21	2C	37	42	4D	58	63	6F	79	84	8F	9A	A5
C	18	24	30	3C	48	54	60	6C	78	84	90	9C	A8	B4
D	1ª	27	34	41	4E	5B	68	75	82	8F	9C	A9	B6	C3
E	1C	2ª	38	46	54	62	70	7E	8C	9A	A8	B6	B4	D2
F	1E	2D	3C	4B	5A	69	78	87	96	A5	B4	C3	D2	E1

4,94

Absolute value		1	2	3		A	B	C
		1	2	3	,	A	B	C
Relative value	Hexadecimal	100	20	3		0,A	0,0B	0,00C

Acc., to position	Decimal	256 $1x16^2$	32 2x16	3 3x1	0,625 10/16	0,0429 $11/16^2$	0,0029 $12/16^3$

4,95

To multiply a number for the base, one runs the comma a position to the right, and if there are not figures left, a zero every is placed every time that multiplies for the base 10 hexadecimal that is equal to 16 decimal.

To divide a number for the base, one runs the comma a position to the left, in the same way that with any positional numeric system, like in binary, or in decimal.

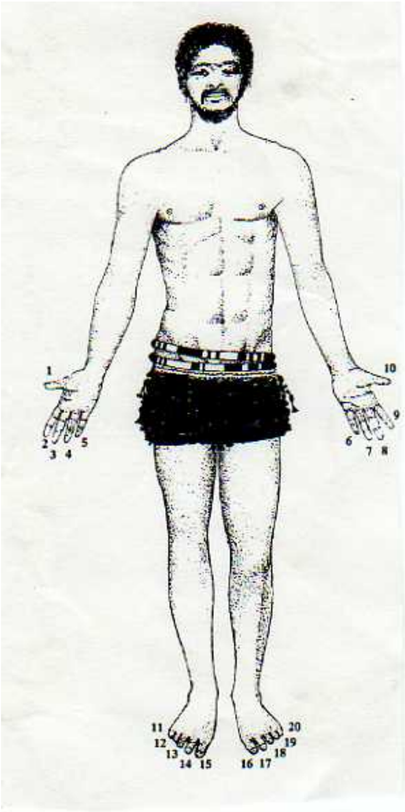
4,100 base 20.

4,101

The numeric system that the Mayan used in centre America when the Spaniards arrived consisted on making groupings of 20 numbers, as if it were in base 20, but not exactly in base 20.

20 is the number of fingers and toes that a man has, among the hands and the feet. 20 is equal to a man in the Mayan system. And 100 is equal to 5 men.

Illustration of how we can count up to 20 and from 20 to 20
using the 20 fingers and toes.



4,102

The Mayan symbols for the numbers are very varied, the simplest ones to represent are the following I expose next comparing them with the current Arab numbers:

Decimal	1	2	3	4	5	6	7	8	9	10
Maya	O	oo	ooo	oooo	----	o ----	oo ----	ooo	oooo ----	---- ----
Decimal	11	12	13	14	15	16	17	18	19	0
Maya	o ---- ----	oo ---- ----	ooo ---- ----	oooo ---- ----	---- ---- ----	o ---- ---- ----	oo ---- ---- ----	ooo ---- ---- ----	oooo ---- ---- ----	ℑ

4.103

The number 13495 in base10, it is written this way:

o	=

(1x7200)

Oo
----- =
(17x360)

= (1x7200) + (17x360) + (8x20) + 15
Ooo
----- = (8x20) 4ª 3ª 2ª 1ª

----- = (15x1)

4,104

If we keep on counting in such a way the days of the calendar.

The 5ª figure	multiplied it for	(7200x20)	= 144.000	
The 6ª figure	multiplied it for	(144.000x20)	= 2.880.000	

So that it were in base 20, the 3ª figure would have to multiply for 400, but they put 360 because it was better for them count the days of the civil calendar that that has 18 months of 20 days each, plus other 5 days that they added. And the 4ª figure multiplies for (360x20) = 7200.

For other matters that didn't have to do with the calendar, it is possible that they used a numeric system with all the figures in base 20, but it is not known with certainty...

The Mayan had a religious calendar of 20 cycles of 13 days each cycle, with a festival day pointed out in each cycle, what is 20x13 = 260 days. And at the same time they used a civil calendar, of 365 days=18 months of 20 days every month plus a period of 5 days to complete the solar year.

It exists the possibility that in the religious calendar, plus the period of 260 days, they had, another period of 105 days, to equal it to the solar civil calendar. But also according to some opinions, the religious calendar of 260 days didn't have more days to equal it to the solar calendar, and they belonged together the two calendars once every 52 years lots, similar to 73 religious years (52x365)=(73x260) = 18.980 days.

Additionally they had a calculation of days of very long duration, and for the days that went counting, 3113 a.e.c went back until the year., that which would give them up to now, a history longer than 5000 years.

In this long count, the years were formed by 360 days.

But that supposed history is lost, because the Spanish conquerors destroyed their religion writings so that they adopted the Catholic religion; the religion of the Bible, the Spanish language, and the submission to a new dynasty of kings different to the history of Mayan dynasties, and representatives of God they had in the earth. From that moment, blot and new count. Among the little thing which survived the calendar is.

Some dates pointed out in trails that have been found, and according to that long count that marks the beginning of the Mayan era, correspond with dates of our calendar, of the years: 292;320; 603; 771;869; 889 e.c. and other dates.

If we wanted to write a number in base 20, using the current numeric characters from 0 to 9 and letters from A to J for the numbers from 10 to 19, we would have to write in base 20 in a similar way as we write today in base 16 in computer programs, with the following equivalences:

4,105

Base 10	0	1	2	3	4	5	6	7	8	9
Base 20	0	1	2	3	4	5	6	7	8	9
Base 10	10	11	12	13	14	15	16	17	18	19
Base 20	A	B	C	D	E	F	G	H	I	J

4,106

Example; the number 4JG in base 20, it is equal to the number 1996 in base 10.

(4)	(J)	G)					
(4x400)	+ (19x20)	+ (16x1)	=1996				

4,107

The number 1996 in base 20 it is equal to the number 11786 in base 10

(1)	(9)	(9)	(6)				
(1x8000)	+ (9x400)	+ (9x20)	+ (6x1)	= 11786			

This numeric system with 20 characters for the base 20 has never been used. The Mayan used only 3 characters to represent 1, 5 and 0, and they repeated those characters to represent other numbers.

4,110 The surface measurement and volume.

4,111
The measure units in surface increase or diminish from an equivalent way to the high numeric base to the square. Using the base 10 and the metric system, the surface unit is the m

^{2} and the multiples and divisions of the unit, they increase and they diminish of 100 in 100, as if it were in base 100 but using only 10 numeric characters, so that it is an operation in base 10.

Km^2	Hm^2	Dm^2	m^2				
1	x100	x100	X100				
1	100	10.000	1.000.000				

4,112

If instead of using base 10, the base 5 was used, the multiples and dividing of the surface unit increase and diminish of 25 in 25. And the measures would have another name, instead of saying square Decametre Dm2, square Pentameter Pm2, or Fifth square meter Qm2 it will be said, 5 x 5 = 25 m^2.
If the base 20 is used, they increase or they diminish of 400 in 400.

4,113

The units of measure of volume, increase or diminish from an equivalent way to the high base to the cube. Using the base 10 and the metric system, the unit of volume is the m3. And the multiples and dividing increase or diminish of 1000 in 1000, as if it were in base 1000.

Km^3	Hm^3	Dm^3	m^3			
1	x1000	x1000	X1000			
1	1000	1000.000	1.000.000.000			

4,114

If the base 5 was used, the multiples and dividing of the unit of volume increase or diminish of 125 in 125. And if the base 20 was used, the multiples and dividing increase or diminish of 8000 in 8000.

4,120 Numbers with knots in the ropes.

. . . Las bandas y el chai ue la plegaria judía.

4,121

The garment of dressing that the Jews put on for the prayers has fringes with knots, those knots are numbers, each number is equal to a word in Hebrew, because in Hebrew each one of the 22 letters of the alphabet has a numeric value, and therefore each letter and each word is equal to a number. The fringes of the shawl form prayers.

4,122

They take written texts in a hidden way in the sleeve and, that way, they do what the law told them to, tiing the words to the hand, in Deuteronomy 6:6-8 and 11:18-21

YHWH יהוה

5 6 5 10 — 26

«Yahveh»

YHWH EHAD יהוה אֶחָד

4 8 1 5 6 5 10 — 39

«Yahveh es uno»

TAL טל

30 9 — 39

«El rocío de la mañana»

יין — 50 10 10 <······ YAYIN 70

סוד — 4 6 60 <······ SOD 70

צמח — 8 40 90 <······ ṢEMAḤ

מנחם — 40 8 50 40 <········· MENAHEM

גבורה — 5 200 6 2 3 <············ GUEVURAH

4,130 Hebrea Numbers.

Números de orden y valores usuales de las letras			A	B	C	D			
1	א	1	1	1^2	1	111	valor de	אלף	'ALEF
2	ב	2	2	2^2	1 + 2	412	»	בית	BÉT
3	ג	3	3	3^2	1 + 2 + 3	73	»	גמל	GUIMEL
4	ד	4	4	4^2	1 + 2 + 3 + 4	434	»	דלת	DALET
5	ה	5	5	5^2	1 + 2 + 3 + 4 + 5	6	»	הא	HE
6	ו	6	6	6^2	1 + 2 + 3 + 4 ... + 6	12	»	וו	VAW
7	ז	7	7	7^2	1 + 2 + 3 + 4 ... + 7	67	»	זין	ZAYIN
8	ח	8	8	8^2	1 + 2 + 3 + 4 ... + 8	418	»	חית	ḤÉT
9	ט	9	9	9^2	1 + 2 + 3 + 4 ... + 9	419	»	טית	TÉT
10	י	10	1	10^2	1 + 2 + 3 + 4 ... + 10	20	»	יוד	YOD
11	כ	20	2	20^2	1 + 2 + 3 + 4 ... + 11	100	»	כף	KAF
12	ל	30	3	30^2	1 + 2 + 3 + 4 ... + 12	74	»	למד	LAMED
13	מ	40	4	40^2	1 + 2 + 3 + 4 ... + 13	90	»	מים	MÉM
14	נ	50	5	50^2	1 + 2 + 3 + 4 ... + 14	110	»	נון	NUN
15	ס	60	6	60^2	1 + 2 + 3 + 4 ... + 15	120	»	סמך	SAMEKH
16	ע	70	7	70^2	1 + 2 + 3 + 4 ... + 16	130	»	עין	'AYIN
17	פ	80	8	80^2	1 + 2 + 3 + 4 ... + 17	85	»	פה	PÉ
18	צ	90	9	90^2	1 + 2 + 3 + 4 ... + 18	104		צדי	TSADÉ
19	ק	100	1	100^2	1 + 2 + 3 + 4 ... + 19	104	»	קוף	QOF
20	ר	200	2	200^2	1 + 2 + 3 + 4 ... + 20	510	»	ריש	RESH
21	ש	300	3	300^2	1 + 2 + 3 + 4 ... + 21	360	»	שין	SHIN
22	ת	400	4	400^2	1 + 2 + 3 + 4 ... + 22	406	»	תו	TAV

4,140 The Greek alphabet numeration.

From 400 a.e.c.

Each letter of the alphabet is equal to a number, the intermediate numbers are got by addition and to distinguish these numeral letters from the ordinary ones, they were crowned with a small superior line.

Α	α	alfa	1	Ι	ι	iota	10	Ρ	ρ	rho	100
Β	β	beta	2	Κ	κ	kappa	20	Σ	σ	sigma	200
Γ	γ	gamma	3	Λ	λ	lambda	30	Τ	τ	tau	300
Δ	δ	delta	4	Μ	μ	my	40	Υ	υ	ypsilon	400
Ε	ϵ	épsilon	5	Ν	ν	ný	50	Φ	ϕ	fi	500
Ϝ	ϛ	digamma*	6	Ξ	ξ	xi	60	Χ	χ	ji	600
Ζ	ζ	dseta	7	Ο	ο	ómicron	70	Ψ	ψ	psi	700
Η	η	eta	8	Π	π	pi	80	Ω	ω	omega	800
Θ	θ	zeta	9	Ϛ	ϙ	koppa	90	Ϡ	ϡ	san (sampí)	900

$\overline{Η}$	8	$\overline{Κ}$	20
$\overline{Θ}$	9	$\overline{ΚΑ}$	21
$\overline{Ι}$	10	$\overline{ΚΒ}$	22
$\overline{ΙΑ}$	11	$\overline{ΚΓ}$	23
$\overline{ΙΒ}$	12	$\overline{ΚΔ}$	24
$\overline{ΙΓ}$	13	$\overline{Κε}$	25

4,150 The gothic system number

This system was used by the Christians from the year 400 E.C. influenced by the Greek system.

LETRAS GÓTICAS	VALOR		LETRAS GÓTICAS	VALOR		LETRAS GÓTICAS	VALOR	
	fonét.	numér.		fonét.	numér.		fonét.	numér.
𐌰	a	1	𐌹	i	10	𐍂	r	100
𐌱	b	2	𐌺	k	20	𐍃	s	200
𐌲	g	3	𐌻	l	30	𐍄	t	300
𐌳	d	4	𐌼	m	40	𐍅	w	400
𐌴	e	5	𐌽	n	50	𐍆	f	500
𐌵	q	6	𐌾	y	60	𐍇	ch	600
𐌶	z	7	𐌿	u	70	𐍈	hw	700
𐌷	h	8	𐍀	p	80	𐍉	o	800
𐌸	th	9	𐍁	[sin valor fonético]	90	𐍊	[sin valor fonético]	900

Latin alphabet with numbers used since 1600 E.C.

Kind of an adaptation of the Greek system.

		A 1 **B 2** **C 3** **D 4** **E 5** **F 6** **G 7** **H 8** **I 9**	**K 10** **L 20** **M 30** **N 40** **O 50** **P 60** **Q 70** **R 80** **S 90**	**T 100** **V 200** **X 300** **Y 400** **Z 500**		

4,160 The numbers in Braille.

4,161

The numbers in Braille for blind people, are of recent use, since the first trimester of the XIX century and the same symbols are used for the first 10 letters of the alphabet, according to the French alphabet, and adding a symbol that distinguishes them from the letters. The Braille uses a combination of 6 points, to write 64 characters, 63 plus the white space. For the computers there is also a combination of 8 points, to write 255 different characters, 254 plus the white space.

4,162

The first computers used the system of 6 bits, to represent each character, equivalent to 6 points where 64 combinations are got from, for 63 more characters plus the white space which are the following:

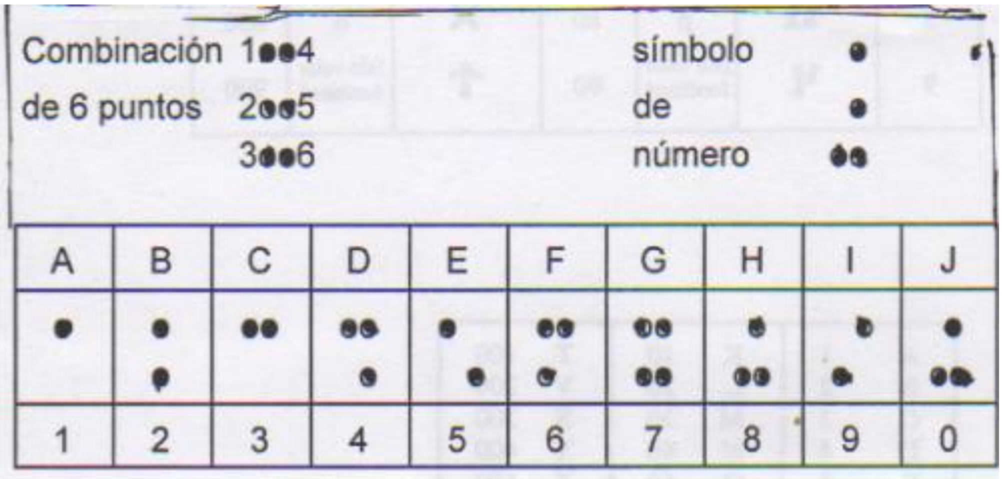
26 capital letters.
10 numeric figures.
28 special characters.

4,163

As in Braille the same combination of points is used for the first 10 capital letters and for the 10 numbers, adding the character that precedes to the numbers, other 9 characters can still be included, using only 6 points.

4,164

In the following sample I show the symbols of the numbers in Braille with points, colored, but in the practice they are in relief, to read by the tact..



4,165

Manual typewriters in Braille only have 6 keys, one for each point, to mark a letter, several keys are pressed at the same time, as many as points the letter has, and the printers of Braille for computers can have 8 or 6 points.

4,166

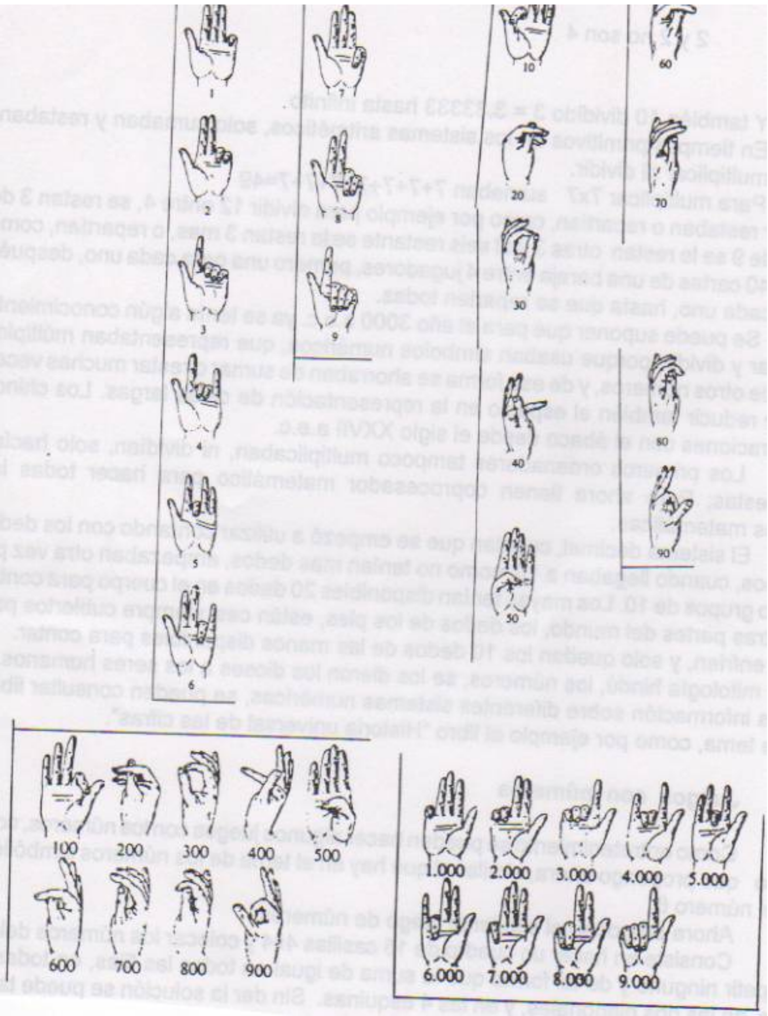
When using as numbers, the letters of the alphabet, it happens that the words and names that can be formed with the first 10 letters of the alphabet, have a numeric value, as the following examples:

EFIGIE	EGEA	EJE	FABADA	FAJA	GAFA	
569795	5 7 51	505	61 21 41	6 1 01	7 161	

4,170 The numbers in language of deaf and dumbs.

4.171

In the language of the deaf ones the position of the fingers of the hand is used to indicate the numbers when they speak with the hands, like I show in the following pictures:



4,172

The negative numbers and those of the Braille system, are not in the Bible, neither they were used in that time, neither before, but I comment them here, as an example of the diversity of numbers and numeric systems which exist.

4.173

It seems to me that mathematics are not an exact science, because we can say for example

2 plus 2 = 4 2 + 2 = 4	2 and 2 = 22	2 and 2 are not 4		
And also	10 divided 3	= 3,33333	until infinite	

4,174

In primitive times in the arithmetic, they only added and subtracted, and they didn't know how to multiply or divide.

To multiply 7x7 they added 7+7+7+7+7+7+7=49
and to divide they subtracted or they distributed, for example to divide 12 among 4, 3 of 12 are subtracted, to the rest of 9 they are subtracted other 3 and at the six remaining they are subtracted 3 but, or they distributed, like 40 letters of a pack of cards are distributed among 4 players, first one for each one, later another more to each one, until all are distributed.

4,175

You can suppose that in the year 3000 a.e.c. one already had some knowledge of how to multiply and to divide, because they used numeric symbols that represented multiples and dividing of other numbers, and in that way they avoid adding or to subtracting the unit many times, and also reduce the space in the representation of long figures. Chinese made operations with the abacus from the century XXVII a.e.c.

4,176

The first computers neither multiplied or divided, they only made sums and subtractions; But now they have mathematical coprocessor to do all the mathematical operations.

4,177

The decimal system is said to be started to use counting with the fingers, when they got to 10, as they didn't have more fingers, they began again with 1, making groups of 10. The Mayan had available 20 fingers in the body to count, but for other parts of the world, the toes, are almost always covered so that they don't cool down, and there are only 10 fingers available to count.

4,178

According to the Hindu mythology, the numbers were given to them by the gods.

For more information on different numeric systems, books can be consulted on this topic.

4,180 games with numbers.

4,181

Juego con números	Ludon per numeroj	games with numbers
Como entretenimiento, podemos hacer algunos juegos con los números, como el ejercicio que propongo ahora. Poner en un cuadrado de 9 celdas (3x3) 9 números, del 1 al 9, sin repetir ninguno, de forma que la suma de igual en todas las filas, en todas las columnas, y en las 2 diagonales. Admite 8 posiciones diferentes, la suma de cada fila da 15. Las 8 posiciones, del cuadrado de 9 números.	Kiel amuzado, ni povas fari iujn ludojn per numerj, kiel ekzercon ke mi proponas nun. Meti en kvadraton de 9 ĉeloj (3x3), 9 numeroj de 1 al 9, sen ripeti neniun, tiel ke la sumo donas egala en ĉiuj vicoj, ĉiuj kolumnoj kaj 2 diagonaloj. Alportas 8 malsamajn poziciojn, la sumo de ĉiu vico donas 15. 8 pozicioj, de la kvadraton de 9 numeroj	As entertainment some games can be made with numbers, as the exercise that I propose now, similar to the one that there is in the topic of the symbolic numbers, In the same way, with 9 numbers from 1 to 9, adding each horizontal file, each vertical column and the 2 diagonal. It always makes 15. The 8 types of positions of the numbers in the chart of 9 numbers

6	1	8
7	5	3
2	9	4

8	1	6
3	5	7
4	9	2

2	9	4
7	5	3
6	1	8

2	7	6
9	5	1
4	3	8

8	3	4
1	5	9
6	7	2

4	9	2
3	5	7
8	1	6

4	3	8
9	5	1
2	7	6

6	7	2
1	5	9
8	3	4

4,182

Con 9 números del 18 al 26, sin repetir ninguno, se forma un cuadrado, que en todas las direcciones da 66	Per 9 numeroj de 18 al 26, sen ripeti, neniu, si formo kvadraton, kiu en ĉiuj direktoj donas 66	Another magic chart magicians used is one in which all directions add 66 with 9 numbers from 18 to

				66
21	26	19	=	66
20	22	24	=	66
25	18	23	=	66
||	||	||		
66	66	66		66

4,183

Con 9 números (3x3) del 14 al 134, de 15 en 15, sin repetir ninguno, se forma un cuadrado, que en todas las direcciones da 222. La suma total del cuadro da 666 Nº: 14, 29, 44, 59, 74, 89, 104, 119, 134.	Per 9 numeroj (3x3) de 14 al 134, de 15 en 15, sen ripeto, formita unu kvadrato, kiu en ĉiuj direktoj donas 222. La totala sumo de la kvadraton donas 666 NO: 14, 29, 44, 59, 74, 89, 104, 119, 134.	With 9 numbers (3x3) from 14 to 134, from 15 to 15, without repeating any, a square is formed, which in all directions gives 222. The total sum of the table gives 666 No: 14, 29, 44, 59, 74, 89, 104, 119, 134.

666				222
119	14	89	=	222
44	74	104	=	222
59	134	29	=	222
II	LI	II		
222	222	222		222

4,184

Ahora propongo el siguiente juego de números:	Nun min proponas la venonta numeroj ludon:	Now I propose the following numeric game:

Consiste en hacer un cuadrado de 16 celdas, 4x4, y colocar los números del 1 al 16, sin repetir ninguno, y de tal forma que la suma de igual en todas las filas, en todas las columnas, en las 2 diagonales, y en las 4 esquinas. Sin dar la solución, se puede tardar varios días en conseguir resolver este rompecabezas, pero a continuación pongo la siguiente solución, en el que la suma da 34 en todas las direcciones:	konsistas fari kvadraton de 16 ĉeloj, 4x4, kaj meti la numerojn de 1 al 16, sen ripeti, kaj tiel ke la sumo donas egala en ĉiuj vicoj, ĉiuj kolumnoj, en la 2 diagonaloj, kaj la 4 angulojn. Sen doni la solvon, ĝi povas preni plurajn tagojn por atingi solvi tiun enigmon, sed tiam mi metas la sekvan solvon, en kiu la sumo donas 34 en ĉiuj direktoj:	It consists on making a square of 16 stalls 4x4 and to place the numbers from 1 to 16 without repeating any and in such a way that the sum will be the same in all the lines, in all the columns, in the two diagonals, and in the 4 corners. Without giving the solution it can take a long time several days to be able to solve this puzzle, but next I write the following solution in which the sum is 34 in all the directions:

34					34
4	14	15	1	=	34
5	11	10	8	=	34
9	7	6	12	=	34
16	2	3	13	=	34
Ll	Ll	ll	ll		
34	34	34	34		34

Ese cuadrado admite 32 posiciones diferentes, dándole vueltas y colocando los números en diferente posición.	Tiu kvadraton elportas 32 malsamaj pozicioj, ĝiri, kaj meti la numerojn en malsama pozicio.	This square admits 32 different positions, giving it turns and placing the numbers in different position

Ahora propongo el siguiente juego de números: Consiste en hacer un cuadrado de 16 celdas, (4x4), colocar los números del 4 al 64 de 4 en 4, sin repetir, La suma da igual en todas las filas, en todas las columnas, en las 2 diagonales, y en las 4 esquinas.	Nun min proponas la venonta numeroj ludon: Konsistas fari kvadraton de 16 ĉeloj, (4x4), kaj meti la numerojn de 4 al 64, de 4 en 4, sen ripeti, kaj tiel ke la sumo donas egala en ĉiuj vicoj, ĉiuj kolumnoj, en la 2 diagonaloj, kaj la 4 angulojn.	Now I propose the following set of numbers: It consists of making a square of 16 cells, (4x4), placing the numbers from 4 to 64 of 4 in 4, without repeating, The sum is equal in all rows, in all columns, In the 2 diagonals, and in the 4 corners

136					136
16	56	60	4	=	136
20	44	40	32	=	136
36	28	24	48	=	136
64	8	12	52	=	136
Ll	Ll	Ll	Ll		
136	136	136	136		136

Ahora propongo el siguiente juego de números: Consiste en hacer un cuadrado de 16 celdas, (4x4), colocar los números del 10 al 160, de 10 en 10, sin repetir, La suma da igual en todas las filas, en todas las columnas, en las 2 diagonales, y en las 4 esquinas.	Nun min proponas la venonta numeroj ludon: Konsistas fari kvadraton de 16 ĉeloj, (4x4), kaj meti la numerojn de 10 al 160, de 10 en 10, sen ripeti, kaj tiel ke la sumo donas egala en ĉiuj vicoj, ĉiuj kolumnoj, en la 2 diagonaloj, kaj la 4 angulojn.	Now I propose the following set of numbers: It consists of making a square of 16 cells, (4x4), placing the numbers from 10 to 160, from 10 in 10, without repeating, The sum is equal in all rows, in all columns, in the 2 diagonals, and in the 4 corners

340					340
40	140	150	10	=	340
50	110	100	80	=	340
90	70	60	120	=	340
160	20	30	130	=	340
ll	Ll	ll	ll		
340	340	340	340		340

4,185

Otro juego que consiste, en hacer un cuadrado de 25 celdas, (5x5), y colocar los números del 1 al 25, sin repetir ningún número, y de tal forma que la suma, de igual en todas las filas, en todas las columnas, en las 2 diagonales, y (las 4 esquinas + el centro), la suma da 65, en todas las direcciones, el cuadrado admite 32 posiciones diferentes.	Alia ludon kiu konsistas en fari kvadraton de 25 ĉeloj, (5x5), kaj meti la numerojn de 1 al 25, sen ripeti ajnan numerojn, kaj tia ke la sumo, donas egala en ĉiuj vicoj, ĉiuj kolumnoj, la 2 diagonaloj, kaj (la 4 angulojn +centro), la sumo donas 65, en ĉiuj direktoj, la kvadraton elportas 32 malsamaj pozicioj.	Another game that consists on making a square of 25 stalls (5x5) and to place the numbers from 1 to 25, without repeating any number and in such a way that the sum will be the same in all the lines, in all the columns and in the two diagonals, the sum is 65 in all the directions, the square admits 32 different positions.

65						65
1	20	22	19	3	=	65
21	10	17	12	5	=	65
2	15	13	11	24	=	65
18	14	9	16	8	=	65
23	6	4	7	25	=	65
=	=	=	=	=		
65	65	65	65	65		65

Otro juego que consiste, en hacer un cuadrado de 25 celdas, (5x5), y colocar los números del 5 al 125, sin repetir ningún número, de 5 en 65 y de tal forma que la suma, de igual en todas las filas, en todas las columnas, en las 2 diagonales, y (las 4 esquinas + el centro), la suma da 325, en todas las direcciones.	Alia ludon kiu konsistas en fari kvadraton de 25 ĉeloj, (5x5), kaj meti la numerojn de 5 al 125, sen ripeti ajnan numerojn, kaj tia ke la sumo, donas egala en ĉiuj vicoj, ĉiuj kolumnoj,en la 2 diagonaloj, kaj (la 4 angulojn +centro), la sumo donas 325, en ĉiuj direktoj, la kvadraton elportas 32 malsamaj pozicioj.	Another set consisting of making a square of 25 cells, (5x5), and placing the numbers from 5 to 125, without repeating any number, of 5 in 65 and in such a way that the sum, of equal in all rows, in all The columns, in the 2 diagonals, and (the 4 corners + the centre), the sum gives 325, in all directions

325						325
5	100	110	95	15	=	325
105	50	85	60	25	=	325
10	75	65	55	120	=	325
90	70	45	80	40	=	325
115	30	20	35	125	=	325
II	LI	II	II	I		
325	325	325	325	325		325

Otro juego que consiste, en hacer un cuadrado de 25 celdas, (5x5), y colocar los números del 10 al 250, sin repetir ningún número, de 10 en 10 y de tal forma que la suma, de igual en todas las filas, en todas las columnas, en las 2 diagonales, y (las 4 esquinas + el centro), la suma da 650, en todas las direcciones.	Alia ludon kiu konsistas en fari kvadraton de 25 ĉeloj, (5x5), kaj meti la numerojn de 10 al 250, sen ripeti ajnan numerojn, 10 en 10, kaj tia ke la sumo, donas egala en ĉiuj vicoj, ĉiuj kolumnoj, en la 2 diagonaloj, kaj (la 4 angulojn +centro), la sumo donas 650, en ĉiuj direktoj.	Another game consisting of making a square of 25 cells, (5x5), and placing the numbers from 10 to 250, without repeating any number, 10 in 10 and in such a way that the sum, in all rows, in all The columns, in the 2 diagonals, and (the 4 corners + the (centre), the sum gives 650, in all directions

650						650
10	200	220	190	30	=	650
210	100	170	120	50	=	650
20	150	130	110	240	=	650
180	140	90	160	80	=	650
230	60	40	70	250	=	650
II	LI	II	II	LI		
650	650	650	650	650		650

4,186

Otro juego, consta de 36 números, del 1 al 36, sin repetir ninguno, colocados en 6 filas, y 6 columnas, de forma que sumando, cada fila, cada columna, y cada diagonal, todas las sumas dan 111, y la suma total de los 36 números, da 666, de la siguiente manera:	Alia ludon konsistas de 36 numerojn, de 1 al 36, sen ripeti neniun, metitaj en 6 vicoj kaj 6 kolumnoj, tiel ke aldoni, ĉiu vico, ĉiu kolono, kaj ĉiu diagonalo, ĉiuj kvantoj donas 111, kaj la sumo 36 totala numerojn donas 666. Kiel sekvas:	Another game consists of 36 numbers, from 1 to 36, without repeating any, placed in 6 rows, and 6 columns, so that adding, each row, each column, and each diagonal, all sums give 111, and the sum Total of 36 numbers, gives 666, as follows:

							CXI
VI	XXXII	III	XXXIV	XXXV	I	=	CXI
VI	XI	XXVII	XXVIII	VIII	XXX	=	CXI
XIX	XIV	XVI	XV	XXIII	XXIV	=	CXI
XVIII	XX	XXII	XXI	XVII	XIII	=	CXI
XXV	XXIX	X	IX	XXVI	XII	=	CXI
XXXVI	V	XXXIII	IV	II	XXXI	=	CXI
ǁ	ǁ	ǁ	ǁ	ǁ	ǁ		
CXI	CXI	CXI	CXI	CXI	CXI		CXI

							111
6	32	3	34	35	1	=	111
7	11	27	28	8	30	=	111
19	14	16	15	23	24	=	111
18	20	22	21	17	13	=	111
25	29	10	9	26	12	=	111
36	5	33	4	2	31	=	111
ǁ	ǁ	ǁ	ǁ	ǁ	ǁ		
111	111	111	111	111	111		111

Otro juego, consta de 36 números, del 6 al 216, de 6 en 6, sin repetir ninguno, colocados en 6 filas, y 6 columnas, de forma que sumando, cada fila, cada columna, y cada diagonal, todas las sumas dan 666, y la suma total de los 36 números, es 3996.	Alia ludon konsistas de 36 numerojn, de 6 al 216, 6 en 6 sen ripeti neniun, metitaj en 6 vicoj kaj 6 kolumnoj, tiel ke aldoni, ĉiu vico, ĉiu kolono, kaj ĉiu diagonalo, ĉiuj kvantoj donas 666, kaj la tuta sumo de la 36 numeroj, estas 3996.	Another game consists of 36 numbers, from 6 to 216, from 6 to 6, without repeating any, placed in 6 rows, and 6 columns, so that adding, each row, each column, and each diagonal, all sums give 666, and the sum total of 36 numbers, is 3996.

nº6+12+18+24+30+36+42+48+54+60+66+72+78+84+90+96+102+108+114+120+126+132+ 138+144+150+156+162+168+174+180+186+192+198+204+ 210+216, suman 3996, entre 6 da 666	3996, inter 6 donas 666	3996, among 6 = 666

							666
36	192	18	204	210	6	=	666
42	66	162	168	48	180	=	666
114	84	96	90	138	144	=	666
108	120	132	126	102	78	=	666
150	174	60	54	156	72	=	666
216	30	198	24	12	186	=	666
||	||	||	||	||	||		
666	666	666	666	666	666		666

Cuadrado de 36 celdas, del 10 al 360, de 10 en 10, da 1110 en cada fila.	Kvadraton de 36 numerojn, de 10 al 360, 10 en 10, donas 1110 en ĉiu vico	Square of 36 cells, 10 to 360, 10 in 10, gives 1110 in each row.

							1110
60	320	30	340	350	10	=	1110
70	110	270	280	80	300	=	1110
190	140	160	150	230	240	=	1110
180	200	220	210	170	130	=	1110
250	290	100	90	260	120	=	1110
360	50	330	40	20	310	=	1110
||	||	||	||	||	||		
1110	1110	1110	1110	1110	1110		1110

4,187

Otro juego. En un cuadrado de 49 celdas, (7x7), colocados los números del 1 al 49, sin repetir ninguno, y de tal forma que la suma de igual, en todas las filas y columnas. La suma da 175 en cada fila.	Alia ludon. En kvadraton de 49 ĉeloj, (7x7), metita 49 numeroj, de 1 al 49, sen ripeti, kaj tiel ke la sumo donas egala en ĉiuj vicoj kaj kolumnoj. La sumo donas 175 en ĉiu vico	Another game. - In a square of 49 stalls (7x7), place the numbers from 1 to 49 without repeating any, and in such a way that the sum will be the same in all the lines and columns. The sum is 175.

								175
20	14	17	31	44	39	10	=	175
9	30	1	45	6	38	46	=	175
43	15	21	28	26	35	7	=	175
16	34	29	24	22	8	42	=	175
3	37	25	23	27	13	47	=	175
36	4	33	19	32	40	11	=	175
48	41	49	5	18	2	12	=	175
LI	II	II	II	II	II	II		
175	175	175	175	175	175	175		174

4,188

Otro juego. En un cuadrado de 64 celdas, (8x8(), colocados los números del 1 al 64, sin repetir ninguno, y de tal forma que la suma de igual, en todas las filas y columnas. La suma da 260 en cada fila.	Alia ludon. En kvadraton de 64 ĉeloj, (8x8), metita 64 numeroj, de 1 al 64, sen ripeti, kaj tiel ke la sumo donas egala en ĉiuj vicoj kaj kolumnoj. La sumo donas 260 en ĉiu vico.	Another game. In a square of 64 cells, (8x8), placed numbers 1 to 64, without repeating any, and in such a way that the sum of equal, in all rows and columns. The sum gives 260 in each row.

58	4	54	9	64	2	62	7	=	260
53	44	50	17	42	22	24	8	=	260
10	47	35	26	39	36	19	48	=	260
51	14	25	34	32	43	46	15	=	260
6	49	40	31	33	28	18	55	=	260
13	16	30	37	27	29	52	56	=	260
12	23	21	45	20	41	38	60	=	260
57	63	5	61	3	59	1	11	=	260
||	||	||	||	||	LI	ll	||		
260	260	260	260	260	260	260	260		

Otro juego. Como el anterior, colocando los números en otra posición. En un cuadrado de 64 celdas, (8x8). Pintando las celdas como en un tablero de los juegos damas y ajedrez.	Alia ludo. Kiel supre, metante numeroj en alia pozicio. En kvadrato de 64 ĉeloj, (8x8). Pentrante la ĉeloj kiel en tabulo ludoj de damoj kaj ŝako.	Another game. Like the previous one, placing the numbers in another position. In a square of 64 cells,(8x8). Painting the cells as on a board of checkers and chess

260	260	260	260	260	260	260	260	

57	63	5	61	3	59	1	11	=	260
53	44	50	17	42	22	24	8	=	260
10	47	35	26	39	36	19	48	=	260
51	14	25	34	32	43	46	15	=	260
6	49	40	31	33	28	18	55	=	260
13	16	30	37	27	29	52	56	=	260
12	23	21	45	20	41	38	60	=	260
58	4	54	9	64	2	62	7	=	260

|| || || || || LI II ||

260	260	260	260	260	260	260	260	