

ALU SCHOOL OF MATHEMATICS



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News Letter

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We are delighted to bring to you this issue of ALU Mathematics News, a monthly newsletter dedicated to the emerging field of Mathematics. This is the first visible –output from the Department of Mathematics, Alagappa University. We are committed to make ALU Mathematics News a continuing and effective vehicle to promote communication, education and networking, as well as stimulate sharing of research, innovations and technological developments in the field. However, we would appreciate your feedback regarding how we could improve this publication and enhance its value to the community. We are keen that this publication eventually grows beyond being a mere –news letter to become an invaluable information resource for the entire Mathematics community, and look forward to your inputs to assist us in this endeavor.



Dr. N. Anbazhagan

MATHEMATICAL AMAZING UNKNOWN FACTS

NAMES FOR ZERO

0-Zero is the only number which is known with so many names including nought, naught, nil, zilch and zip.

AMAZING PIE

π - Pie is the ratio of the circumference to diameter of the circle. It can not be expressed as fraction, making it an irrational number. It never repeats and never ends when written as a decimal.

WHAT COME AFTER A MILLION

Billion, Trillion, Quadrillion, Quintillion, Sextillion, Septillion, Octillion, Nonillion, Decillion and undecillion.

WHAT LIES BEHIND 'GOOGLE'?

The name of the popular search engine, GOOGLE come from a misspelling of the word 'GOOGOL' which is a very large number. (The number followed by one hundred zeros in one thousand).

LETTER 'A'

A- From number 0 to 1000, the letter A only appears in 1000.

DICE MAGIC

The opposite sides of a dice always add up to seven.

KNOWLEDGE – HARDWORK – ATTITUD

While Hard work and Knowledge will get you close, Attitude will get you there!

Then

$$K - N - O - W - L - E - D - G - E = 11 + 14 + 15 + 23 + 12 + 5 + 4 + 7 + 5 = 96\%$$

And

$$H - A - R - D - W - O - R - K = 8 + 1 + 18 + 4 + 23 + 15 + 18 + 11 = 98\%$$

But

$$A - T - T - I - T - U - D - E = 1 + 20 + 20 + 9 + 20 + 21 + 4 + 5 = 100\%$$

MATH IS 'FUN' CTIONAL

MARRY X-MAS

$$y = \frac{\log_e\left(\frac{X}{M} - sa\right)}{r^2}$$

$$yr^2 = \log_e\left(\frac{X}{M} - sa\right)$$

$$e^{yr^2} = \frac{X}{M} - sa$$

$$Me^{yr^2} = X - Msa$$

$$**Me^{rry} = X - Mas**$$

HAPPY NEW YEAR

$$w - \ln|ap^2H + a^{ar}| = \ln|Y| - \ln|N|$$

$$w = \ln|ap^2H + a^{ar}| + \ln\left|\frac{Y}{N}\right|$$

$$w = \ln\left|(ap^2H + a^{ar})\frac{Y}{N}\right|$$

$$e^w = \ln(ap^2H + e^{ar})\frac{Y}{N}$$

$$e^w N = (ap^2H + e^{ar})Y$$

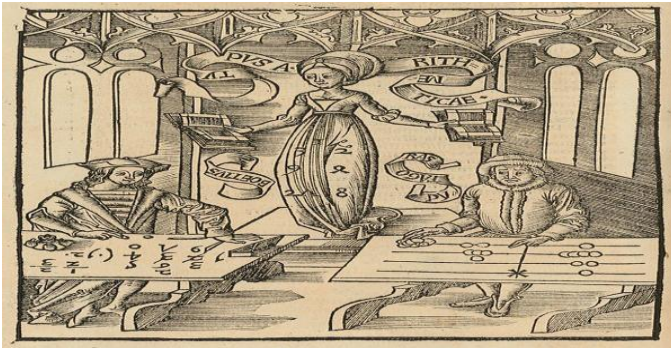
$$e^w N = ap^2HY + e^{ar}Y$$

$$ap^2HY = e^w N - e^{ar}Y$$

$$**Happy = Ne^w - Ye^{ar}**$$

ABACUS MATHEMATICS

Abacus is a device used by visually impaired children for doing basic mathematical calculations. Abacus is rectangular in shape. Abacuses with varied columns are used in different countries. The use of the word *abacus* dates before 1387 AD, when



a Middle English work borrowed the word from Latin to describe a sandboard abacus.

It is a frame divided into an upper and lower section by a bar called the “beam.” The abacus can be used for addition, subtraction, multiplication, and division.

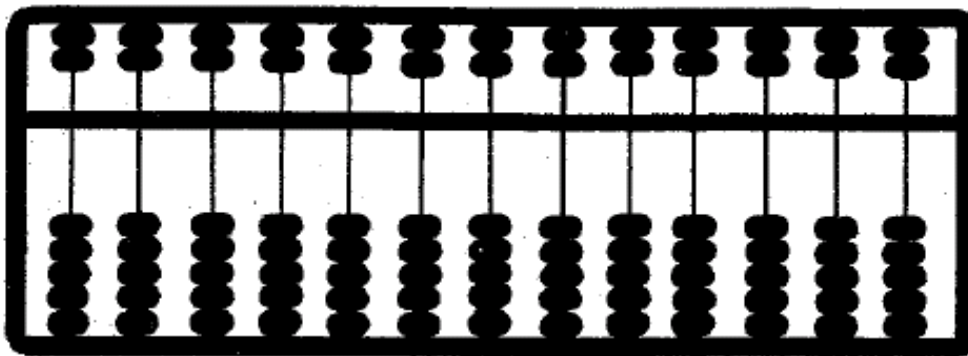
The **abacus** also called a **counting frame**, is a calculating tool that was in use in Europe, China and Russia, centuries before the adoption of the written Hindu-Arabic numeral system and is still used by merchants, traders and clerks in some parts of Eastern Europe, Russia, China and Africa.

CHINESE ABACUS: SUANPAN

CLEARING THE ABACUS

- Before you begin work on the abacus you must clear it.
- This is done by moving all of the beads in the upper section to the top of the frame and all of the beads in the lower section to the bottom of the frame.

It should look like this,

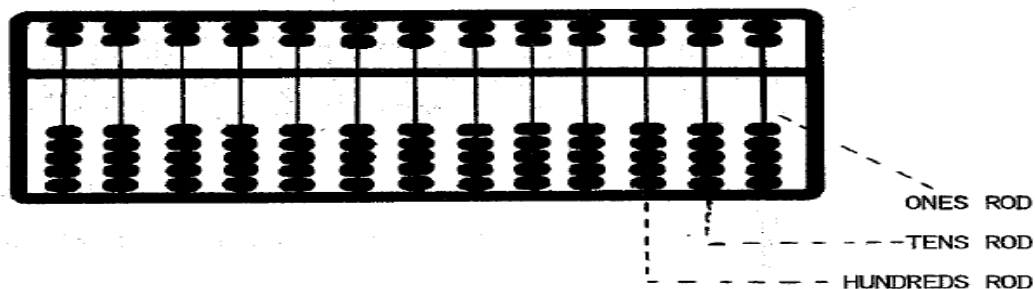


USING YOUR FINGERS TO MOVE THE BEADS

- Put your Abacus on your desk.
- Hold it with your left hand.
- Use your **thumb** to move the beads in the lower section up.
- Use your **index finger** to move the beads in the lower section down.
- Use your **middle finger** to move the upper section beads up and down

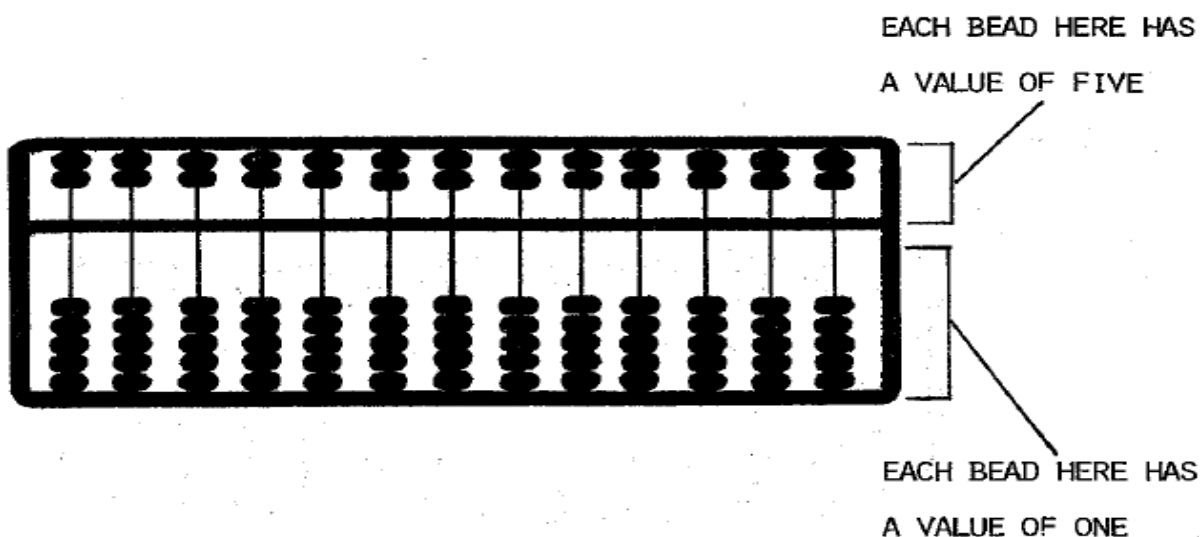
NUMBERS SETTINGS

The Abacus has thirteen rods. The exercises we will do will use the first three rods – the ones rod, the tens rod, and the hundreds rod.

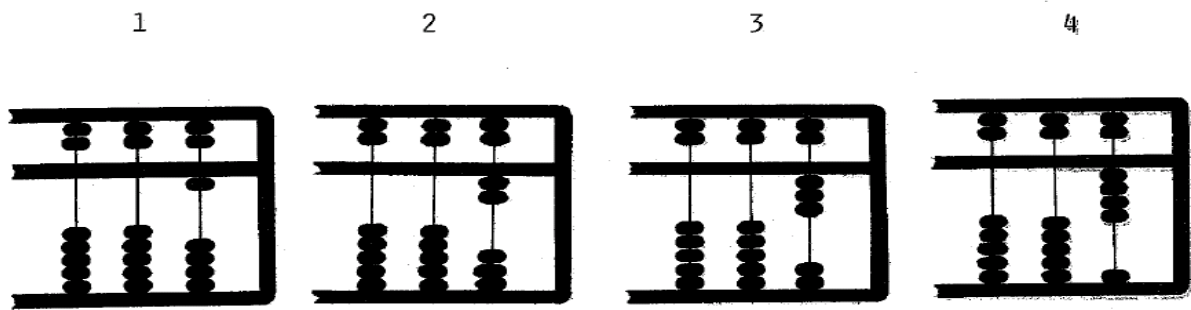


There are two beads on the upper section of each rod and five beads on the lower section of each rod.

- Each bead in the upper section has a value of 5.
- Each bead in the lower section has a value of 1.

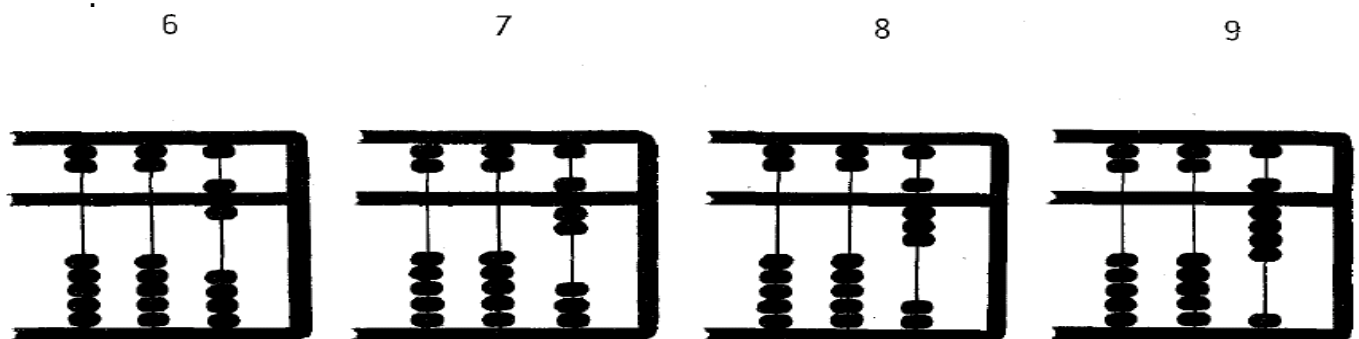
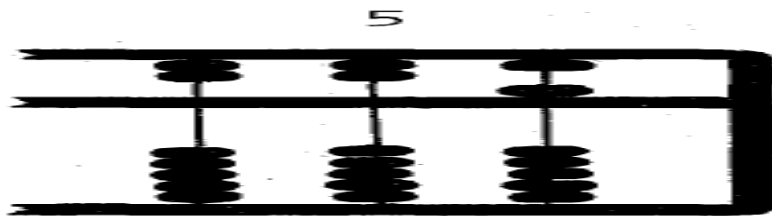


- To set a number less than 10, you only need to count and move beads on the ones rod.
- When reading the abacus, you count only the beads that have been moved to the beam in the middle.
- Here are some numbers and how they would look on the abacus:



TO SET THE NUMBER 5,6,7 AND 8

- move the bead in the upper section of the ones rod down to the beam. (The fifth bottom bead is not used in addition.)
- As soon as five bottom beads are needed, clear the bottom section and bring down on bead from the top.

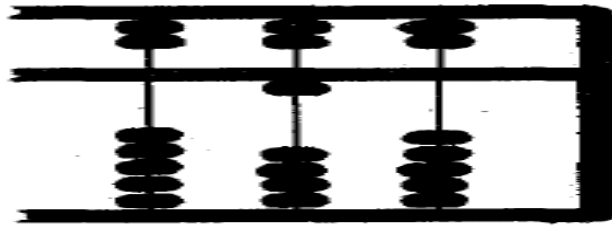


TO SET THE NUMBER 10 ON THE ABACUS

- clear the beads on the ones rod and
- move one bead on the lower section of the tens rod up to the beam.
- As soon as you have 5 beads up in the bottom section and one bead down in the top section,
- clear that row and push up one in the bottom section of the next column.

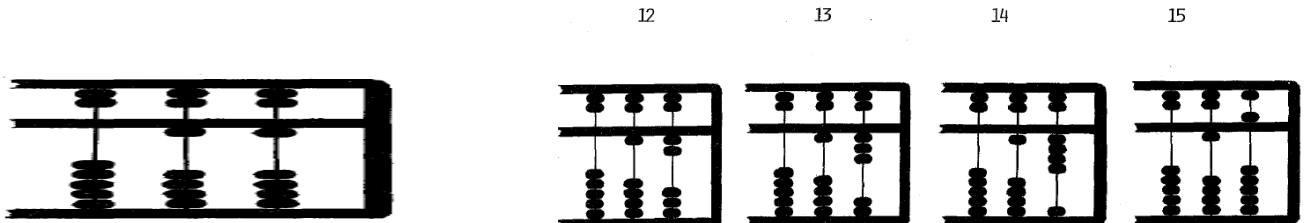
Our abacus should look like this:

10



TO SET THE NUMBER 11 ON THE ABACUS

- With a number of 10 or more, begin with the column you will need that is furthest to the left.
- To make 11, first move up one bead on the lower section of the tens rod, then move up one bead on the lower section of the ones rod.



Similarly, we can set

34

48



UP, DOWN, RID, ADVANCE

Up: move one bead at the lower section up (use your thumb)

Down: move one bead on the upper section down (use your middle finger)

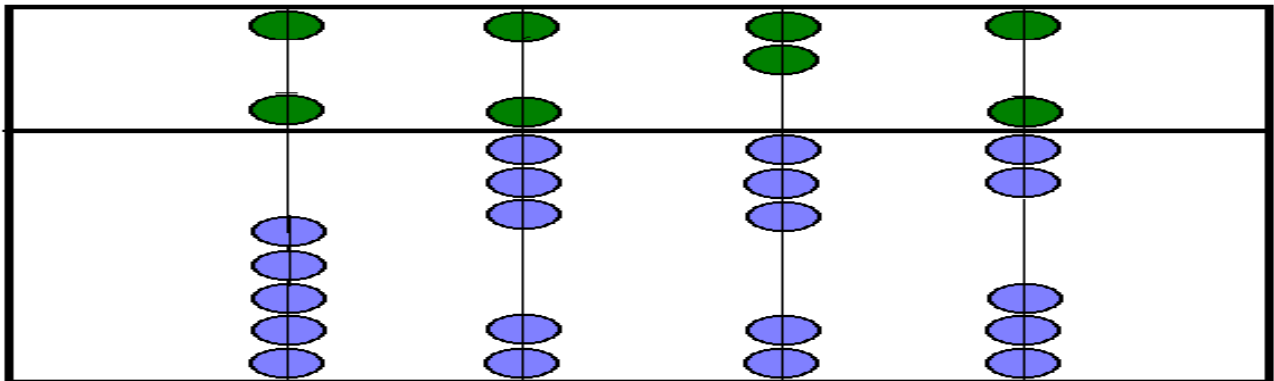
Rid: move one bead on the lower section down (use your index finger)

(or) move one bead of the upper section up (use your middle finger)

Advance: move one bead up in the next rod to the left (use your thumb).

ADDING ON THE ABACUS

Suppose you want to add $2,364 + 3,473$. To do this put 2364 on the abacus. You need to move 3 to the center on the right-hand string. There aren't three singles. Instead, you can move a 5 to the center and move 2 1's back. Move 2 ones and one 5 to the center on the tens string. You have two 5's on the tens string so you can regroup. Move the two 5's on the tens string away from the center and move a 1 to the center on the hundreds string. Now you need to move 4 to the center on the hundreds string. To do this move 5 to the center and one away from the center on the hundreds string. Last step: move 3 ones to the center on the thousands string. You now have five ones at the center on the thousands string, so you move them away and replace them with a 5. Here's the result:

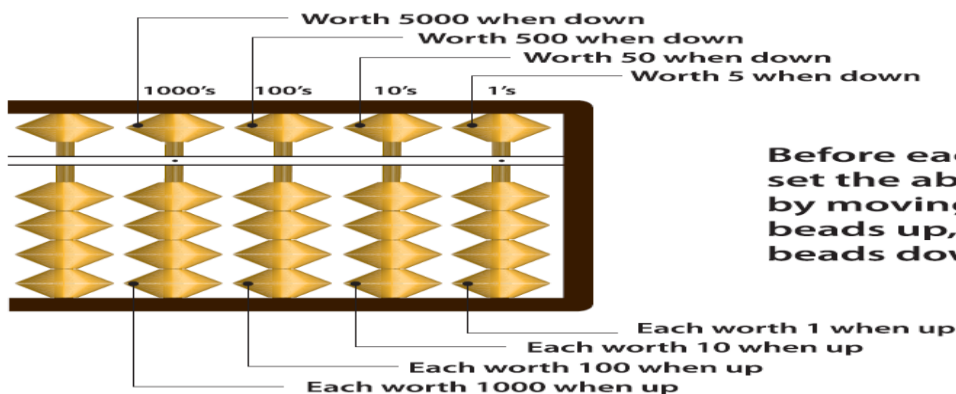


In addition: the top-most bead and the bottom-most bead are not used.

Math + You = Champions that sums it up

JAPANESE ABACUS: SOROBAN

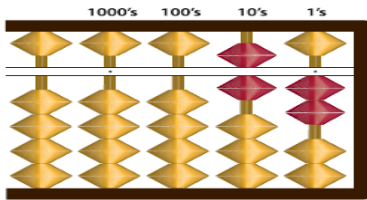
VALUE OF BEADS



Before each calculation, set the abacus to zero by moving all Heaven beads up, and all Earth beads down.

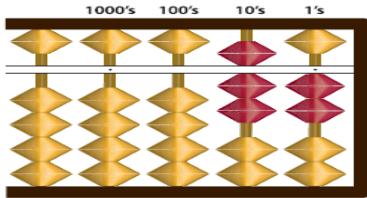
Examples: 1

$$62+12=74$$



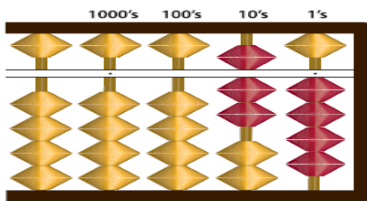
Step 1

Move one 10's Earth bead up and one 10's Heaven bead down (=60)
Then move two 1's Earth beads up (=62)



Step 2

Move one 10's Earth bead up to add 10 (=72)



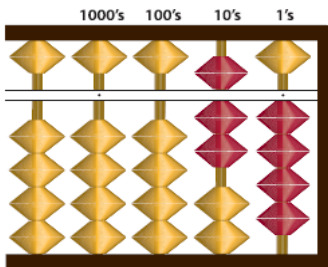
Step 3

Move two 1's Earth beads up to add 2 (=74)

Result: 74

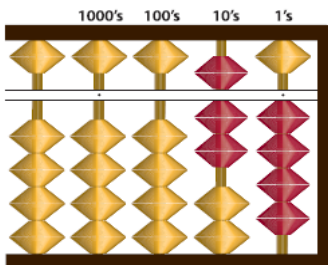
Examples: 2

$$74+53=127$$



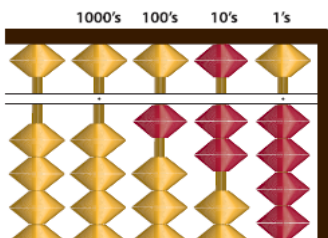
Step 1

Move two 10's Earth bead up and one 10's Heaven bead down (=70)
Then move four 1's Earth beads up to add 4 (=74)



Step 2

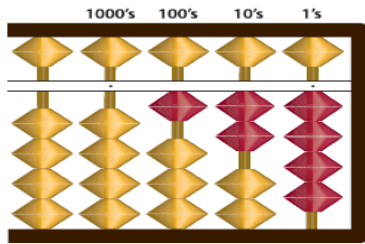
Try to move one 10's Heaven down to add 50, but it's already down...



Step 3

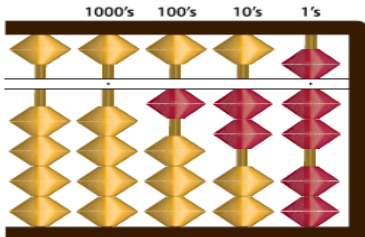
So move it up to subtract 50 then move a 100's Earth bead up to add 100 (=124).

**This is a carry from 10's to 100's place!*



Step 4

Then, try to move three 1's Earth beads up add 3, but they are all up...



Step 5

So move the 1's Heaven bead down to add 5, then move two Earth beads down to subtract 2
**This is a "carry" from Earth to Heaven!*

Result: 127

DID YOU KNOW THAT...

1. $\pi=3.14159\ 26535\ 89793\ 23846\ 26433\ 83279\ 50288\ 41971\ 69399\ 37510\ 58209\ 74944\ 59230\ 78164\ 06286\ 20899\ 86280\ 34825\ 34211\ 70679\ 82148\ 08651\ 32823\ \dots$
2. A sphere has two sides. However, there are [one-sided surfaces](#).
3. There are [shapes of constant width](#) other than the circle. One can even drill square holes.
4. There are just [five regular polyhedra](#)
5. In a [group of 23 people](#), at least two have the same birthday with the probability greater than $1/2$
6. Everything you can do with a ruler and a compass you can do with the [compass alone](#)
7. Among all shapes with the same perimeter a [circle has the largest area](#).
8. There are curves that [fill a plane without holes](#)
9. Much as with people, there are [irrational, perfect, complex](#) numbers
10. As in philosophy, there are [transcendental](#) numbers
11. As in the art, there are [imaginary and surreal](#) numbers
12. [You are wrong if you think Mathematics is not fun](#)
13. Mathematics studies [neighborhoods, groups](#) and [free groups, rings, ideals, holes, poles](#) and [removable poles, trees, growth](#) ...
14. Mathematics also studies [models, shapes, curves, cardinals, similarity, consistency, completeness, space](#) ...
15. Among objects of mathematical study are [heredity, continuity, jumps, infinity, infinitesimals, paradoxes](#)...
16. Last but not the least, Mathematics studies [stability, projections](#) and [values](#), values are often [absolute](#) but may also be [extreme](#), local or global.
17. Trigonometry aside, Mathematics comprises fields like [Game Theory, Braids Theory, Knot Theory](#) and more

18. [One](#) is *morally* obligated not to do anything impossible
19. Some numbers are [square](#), yet others are [triangular](#)
20. The next sentence is true but you must not believe it
21. The previous sentence was false
22. [12+3-4+5+67+8+9=100](#) and there exists at least one other representation of 100 with 9 digits in the right order and math operations in between
23. One can [cut a pie](#) into 8 pieces with three movements
24. [Program](#)=[Algorithms](#)+[Data Structures](#)
25. There is [something](#) the dead eat but if the living eat it, they die.
26. A [clock](#) never showing right time might be preferable to the one showing right time twice a day
27. Among all shapes with the same area [circle has the shortest perimeter](#)

