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FIBONACCI NUMBERS IN DAILY LIFE

In this article the notion of Fibonacci numbers and their application in various spheres of life is considered.

Fibonacci sequence was firstly introduced by an Italian mathematician Fibonacci in his book Liber Abaci. On pages 123-124 of the Fibonacci's manuscript he presents such problem: *"Someone put a pair of rabbits in a certain place, surrounded by a wall, in order to know how many pairs of rabbits will be born during a year. In fact, the nature of rabbits is such that after a month the pair of rabbits gives birth to another pair, and the birth process of rabbits occurs from the second month after their birth"*. This problem has created the most famous numerical sequence in the world. The scientist did not know what role it would play in the history of mankind. The Fibonacci sequence presents a series of numbers where a number is found by adding the two previous numbers. Starting with 0 and 1, the sequence goes 0, 1, 1, 2, 3, 5, 8, 13, 21, 34, and so forth. Written as a rule, the expression is

$$x_n = x_{n-1} + x_{n-2}.$$

The Fibonacci sequence is not just a game with numbers. It is one of the most important mathematical expression of natural phenomena. The examples below present some interesting applications of this mathematical sequence.

This sequence asymptotically tends to a constant value. However, this ratio is irrational. It is impossible to express it exactly. We will bring it in the form of 1.618. When we divide any member of the Fibonacci sequence the result gets back to 1.618 (0.382) value. The Fibonacci series was discovered in the placement of sunflower seeds, pine cones, in the distribution of leaves or pine needles on trees, in the placement of stems. But the most surprising is application of this phenomenon in our life – it divides the human body in the golden section. Many scientists have devoted significant amount of time to guess the secrets of Giza pyramid. It still remains the preeminent numerical puzzle. Edge length is divided by the height, gives the ratio $F=1,618$. Height is 484,4 of the foot is 5813 inches (5–8–13) is the number of the Fibonacci sequence.

From the history of astronomy it is known that I. Tus, German astronomer of the XVIII century, using the Fibonacci sequence found a pattern and order in the distances of our solar system. In 1997, several features of the sequence were described by Vladimir Mikhailov. Mikhailov is convinced that Nature is developing according to the laws, which are incorporated in this numerical sequence. In a pine cone, if you look at it from the side of the handle, you can find two spirals, swirling against one another in a clockwise direction. The number of these spirals, 8 and 13. Sunflower has observed pairs of spirals: 13 and 21, 21 and 34, 34 and 55, 55 and 89. The human set of chromosomes somatic cells (23 pairs), the basis of hereditary diseases are 8, 13 and 21 pairs of chromosomes.

This is not a complete list of the applications of the Fibonacci sequence; however, it plays a huge role in our world.

References

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3. Henderson, H.. Mathematics: Powerful patterns in nature and society. Chelsea House; New York, NY: 2007.