I. Lavrynovych
Research supervisor: A. V. Prus,
Candidate of Physical and Mathematical Sciences
Zhytomyr Ivan Franko State University
Language tutor: L. P. Serdiichuk

RATIONAL AND IRRATIONAL NUMBERS

This problem has always attracted the attention of famous mathematicians. It has been studied by many scientists such as Pythagoras, Johann Carl Friedrich Gauss, Thomas Bradwardin, Gerolamo Cardano and others.

A rational number is a part of the whole expressed as a fraction, a decimal or a percentage. A number is rational if we can write it as a fraction where the top number of the fraction and the bottom one are both whole numbers. The term rational is derived from the word 'ratio' because the rational numbers are figures which can be written in the ratio form.

Every whole number, including negative numbers and zero, is a rational one. This is because every whole number ‘n’ can be written in the form n/1. For example, 3 = 3/1 and therefore 3 is a rational number.

Numbers such as 3/8 and -4/9 are also rational because their numerators and denominators are both whole numbers.

Recurring decimals such as 0.26262626…, all integers and all finite decimals, such as 0.241, are also rational numbers.

Alternatively, an irrational number is any number that is not rational. It is a number that cannot be written as a ratio of two integers (or cannot be expressed as a fraction).

For example, the square root of 2 is an irrational number because it cannot be written as a ratio of two integers.

The square root of 2 is not a number of arithmetics: no whole number, fraction, or decimal has a square of 2. Irrational numbers are square roots of non-perfect squares. Only the square roots of square numbers are rational.

Similarly π is an irrational number because it cannot be expressed as a fraction of two whole numbers and it has no accurate decimal equivalent.

π is an unending, never repeating decimal, or an irrational number. The value of π is actually 3.14159265358979323… There is no pattern to the decimals and you cannot write down a simple fraction that equals π.

Euler's Number (e) is another famous irrational number. Like π, Euler's Number has been calculated to many decimal places without any pattern showing. The value of e is 2.71828182845904523… and keeps going much like the value of π.

The golden ratio (whose symbol is the Greek letter " φ ") is also an irrational number. It is a special number approximately equal to 1.618 but again its value is never ending: 1.61803398874989484820...

Consequently, this problem is very important for the study of mathematics as well as the derivation of the notion of number as the main component of this science.

References

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