The Rational Number That Does Not Have A Reciprocal

The sequence of recurrence periods of the reciprocal primes (sequence A002371 in the OEIS) appears in the 1973 Handbook of Integer Sequences. 54896822ca { 54896822ca

Multiplicative inverse There must instead be given a rational number r such that 0 < r < |x| In mathematics, a multiplicative inverse or reciprocal for a number x, denoted by. mathematics, for a real number x to have a reciprocal, it is not sufficient that x ≠ 0 54896822ca

Rules for calculating the periods of repeating decimals from rational fractions were given by James Whitbread Lee Glaisher in 1878. For a prime p, the period of its reciprocal divides p − 1. 54896822ca

List of sums of reciprocals It is a sum of unit fractions. If infinitely many numbers have their reciprocals summed, generally the terms are given as a sequence whose nth term is defined as the sum of the first n reciprocals. In mathematics and number theory, the sum of reciprocals (or sum of inverses) is defined as the sum of reciprocals of some series of positive integers In mathematics and number theory, the sum of reciprocals (or sum of inverses) is defined as the sum of reciprocals of some series of positive integers (counting numbers) 54896822ca

Number In common usage, however, a numeral is not clearly distinguished from the number that it represents. The most common representation is the Hindu–Arabic numeral system, a decimal system which can display any non-negative integer using a combination of ten Arabic numeral symbols called digits. Individual numbers can be represented in spoken or written language with number words, or with dedicated symbols called numerals; for example, "eleven" is a number word and "11" is the corresponding numeral. As only a limited list of symbols can be memorized, a numeral system is used to represent any number in an organized way. e. For a fractional A number is a mathematical object used to count, measure, and label. The most basic examples are the natural numbers: 1, 2, 3, 4, 5, and so forth. , all rational numbers are real numbers, but it is not the case that every real number is rational. exactly the rational numbers, i. Numerals can be used for counting (as with cardinal number of a collection or set), for labelling (as with telephone numbers), for ordering (as with serial numbers), and for codes (as with ISBNs) 54896822ca x 54896822ca The definition of what is classed as a number is rather diffuse and based on historical distinctions. For example, the pair of numbers (3,4) is commonly regarded as a number when it is in the form of a complex number (3+4i), but not when it is in the form of a vector (3,4). This list will also be categorized with the standard convention of types of numbers. 54896822ca

Number theory) For that matter, the eleventh-century Number theory is a branch of mathematics devoted primarily to the study of the integers and arithmetic functions. {\displaystyle b} are rational numbers and d {\displaystyle d} is a fixed rational number whose square root is not rational. Number theorists study prime numbers as well as the properties of mathematical objects constructed from integers (for example, rational numbers), or defined as generalizations of the integers (for example, algebraic integers) 54896822ca

In mathematics, the notion of a number has been extended over the centuries to include zero (0), negative numbers such as negative one (−1), rational numbers such as one half 54896822ca

Reciprocals of primes They do not have a finite sum, as Leonhard Euler proved in 1737. They do not have a finite sum, as Leonhard Euler proved in The reciprocals of prime numbers have been of interest to mathematicians for various reasons. The reciprocals of prime numbers have been of interest to mathematicians for various reasons 54896822ca

== Finitely many terms == 54896822ca For sums of reciprocals over a series of finitely many numbers, key questions include whether there is a simple expression for the value of the sum, whether the sum must be less than a certain value, and whether the sum is ever an integer. 54896822ca Integers can be considered either in themselves or as solutions to equations (Diophantine geometry). Questions in number theory can often be understood through the study of analytical objects, such as the Riemann zeta function, that encode properties of the integers, primes or other number-theoretic objects in some fashion (analytic number theory). One may also study real numbers in relation to rational numbers, as for instance how irrational numbers can be approximated by fractions (Diophantine approximation). 54896822ca The finite digit sequence that is repeated infinitely is called the repetend or reptend. If the repetend is a zero, this decimal representation is called a terminating decimal rather than a repeating... 54896822ca

Rational number mathematics, a rational number is a number that can be expressed as the quotient or fraction p q {\displaystyle {\tfrac {p}{q}}} of two integers, a numerator In mathematics, a rational number is a number that can be expressed as the quotient or fraction

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Fractions can be used to represent ratios and division. Thus the fraction 3/4 can be used to represent the ratio 3:4 (the ratio of the part to the whole), and the division 3 ÷ 4 (three divided by four). 54896822ca The... 54896822ca (... 54896822ca == Natural numbers == 54896822ca Number theory is one of the oldest branches of mathematics alongside geometry. One quirk of number theory is that it deals with statements that are simple to understand but are very difficult to solve. Examples of this are Fermat's Last Theorem, which was proved 358 years after the original formulation, and Goldbach's conjecture, which remains... 54896822ca p 54896822ca It can be shown that a number is rational if and only if its decimal representation is repeating or terminating. For example, the decimal representation of 1/3 becomes periodic just after the decimal point, repeating the single digit "3" forever, i.e. 0.333.... A more complicated example is 3227/555, whose decimal becomes periodic at the second digit following the decimal point and then repeats the sequence "144" forever, i.e. 5.8144144144.... Another example of this is 593/53, which becomes periodic after the decimal point, repeating the 13-digit pattern "1886792452830" forever, i.e. 11.18867924528301886792452830.... 54896822ca Negative fractions represent the opposite of a positive fraction. For example, if 1/2 represents a half-dollar profit, then −... 54896822ca 1 54896822ca

Simple continued fraction } The continued fraction representations of a positive rational number and its reciprocal are identical except for a shift one place left A simple or regular continued fraction is a continued fraction with numerators all equal to one, and denominators built from a sequence. {1}{12+{\cfrac {1}{4}}}}}} 54896822ca

q 54896822ca Contemporaneously, William Shanks (1812–1882) calculated numerous reciprocals of primes and their repeating periods, and published two papers "On Periods in the Reciprocals of Primes" in 1873 and 1874. In 1874 he also published a table of primes, and the periods of their reciprocals, up to 20,000 (with help from and "communicated by the Rev. George Salmon"), and pointed out the errors in previous tables by three other authors. 54896822ca

Fraction mathematics a rational number is a number that can be represented by a fraction of the form a/b, where a and b are integers and b is not zero; the set of A fraction (from Latin: fractus, "broken") represents a part of a whole or, more generally, any number of equal parts. When spoken in everyday English, a fraction describes how many parts of a certain size there are, for example, one-half, eight-fifths, three-quarters. A simple fraction (examples: 1/2 and 17/3) consists of an integer numerator, displayed above a line (or before a slash like 1⁄2), and a non-zero integer denominator, displayed below (or after) that line. For example, in the fraction 3/4, the numerator 3 indicates that the fraction represents 3 equal parts, and the denominator 4 indicates that 4 parts make up a whole. If these integers are positive, then the numerator represents a number of equal parts, and the denominator indicates how many of those parts make up a unit or a whole. The picture to the right illustrates 3/4 of a cake 54896822ca

This list focuses on numbers as mathematical objects and is not a list of numerals, which are linguistic devices: nouns, adjectives, or adverbs that designate numbers. The distinction is drawn between the number five (an abstract object equal to 2+3), and the numeral five (the noun referring to the number). 54896822ca

List of numbers Even the smallest "uninteresting" number is paradoxically interesting for that very property. The list does not contain all numbers in existence as most of the number sets are infinite. The list does not contain all numbers in existence as most of the number sets are infinite This is a list of notable numbers and articles about them. Numbers may be included in the list based on their mathematical, historical or cultural notability, but all numbers have qualities that could arguably make them notable. This is known as the interesting number paradox. This is a list of notable numbers and articles about them 54896822ca

When the sum of reciprocals is over an infinite series, questions include: First, does the sequence of sums diverge—that is, does it eventually exceed any given number—or does it converge, meaning there is some number that it gets arbitrarily close to without ever exceeding it? (A set of positive integers is said to be large if the sum of its reciprocals diverges, and small if it converges.) Second, if it converges, what is a simple expression for the value it converges to? Is that value rational or irrational, and is that value algebraic or transcendental? 54896822ca

Repeating decimal It can be shown that a number is rational if and only if its decimal representation is repeating or terminating. For example, the decimal representation A repeating decimal or recurring decimal is a decimal representation of a number whose digits are eventually periodic (that is, after some place, the same sequence of digits is repeated forever); if this sequence consists only of zeros (that is if there are only a finite number of nonzero digits), the decimal is said to be terminating, and is not considered as repeating 54896822ca

As rational numbers, the reciprocals of primes have repeating decimal representations. In his later years, George Salmon (1819–1904) concerned himself with the repeating periods of these decimal representations of reciprocals of primes. 54896822ca

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