

# The Rational Number That Are Equal To Their Reciprocal

The... 3a8be81225 == Natural numbers == 3a8be81225 x 3a8be81225 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... 3a8be81225

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 3a8be81225

Negative fractions represent the opposite of a positive

fraction. For example, if  $1/2$  represents a half-dollar profit, then ... 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  $3 \div 4$  (three divided by four).

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. 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. 
$$\frac{1}{p} = \frac{q}{p^2} \implies \frac{1}{p} = \frac{q}{p^2}$$

Multiplicative inverse reciprocals of every rational number are rational, and reciprocals of every complex number are complex. The property that every element other than zero In mathematics, a multiplicative inverse or reciprocal for a number  $x$ , denoted by

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? 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.

Reciprocals of primes not have a finite sum, as Leonhard Euler proved in 1737. They do not have a finite sum, as Leonhard Euler proved in 1737. As rational numbers, the reciprocals of primes have repeating decimal representations. In his later The reciprocals of prime numbers have been of interest to mathematicians for various reasons

List of sums of reciprocals It is a sum of unit fractions. 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). If infinitely many numbers have their reciprocals summed, generally the terms are given as a sequence whose  $n$ th term is

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defined as the sum of the first  $n$  reciprocals

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  $p - 1$ .

**Number theory** Number theory is one of the Number theory is a branch of mathematics devoted primarily to the study of the integers and arithmetic functions. 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). to rational numbers, as for instance how irrational numbers can be approximated by fractions (Diophantine approximation)

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

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...

**Fraction** When spoken in everyday English, a fraction

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describes how many parts of a certain size there are, for example, one-half, eight-fifths, three-quarters. 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. A simple fraction (examples:  $\frac{1}{2}$  and  $\frac{17}{3}$ ) consists of an integer numerator, displayed above a line (or before a slash like  $\frac{1}{2}$ ), and a non-zero integer denominator, displayed below (or after) that line. The picture to the right illustrates  $\frac{3}{4}$  of a cake. displayed below (or after) that line. For example, in the fraction  $\frac{3}{4}$ , 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 A fraction (from Latin: fractus, "broken") represents a part of a whole or, more generally, any number of equal parts 3a8be81225

Rational number In mathematics, a rational number is a number that can be expressed as the quotient or fraction  $\frac{p}{q}$  of two integers In mathematics, a rational number is a number that can be expressed as the quotient or fraction 3a8be81225

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). 3a8be81225

List of numbers The distinction is drawn between the number five (an abstract object equal to  $2+3$ ), and the numeral five (the noun referring This is a list of notable numbers and articles about them. This is known as the interesting number paradox. The list does not contain all numbers in existence as most of the number sets are infinite. 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. Even the smallest "uninteresting" number is paradoxically interesting for that very property. adverbs that designate numbers 3a8be81225

The sequence of recurrence periods of the reciprocal primes (sequence A002371 in the OEIS) appears in the 1973 Handbook of Integer Sequences. 3a8be81225  
Natural numbers ( 3a8be81225 == Main types == 3a8be81225  
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). 3a8be81225

List of types of numbers  $\mathbb{Q}$  ): Real numbers that are not rational. Imaginary numbers: Numbers that equal the product of a real number and the imaginary unit  $i$   $\{\displaystyle$  Numbers can be classified according to how they are represented or according to the properties that they have 3a8be81225

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.  $0.333\dots$ . 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.  $5.8144144144\dots$ . Another example of this is  $593/53$ , which becomes periodic after the decimal point, repeating the 13-digit pattern "1886792452830" forever, i.e.

$11.18867924528301886792452830\dots$  3a8be81225 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. 3a8be81225

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