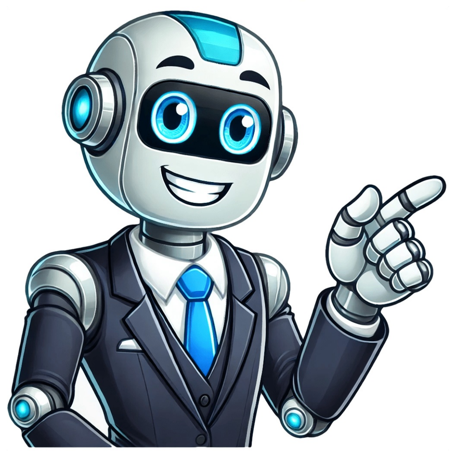

What does terminate mean in math

A terminating decimal is a number with finite digits after the decimal point. It has an end-digit and can be expressed as a fraction. Examples of terminating decimals include 17.28, -22.45435, and 0.45. All terminating decimals are rational numbers that can be written in the form of a fraction. For instance, 1.5 is equivalent to $\frac{15}{10}$. A number is identified as a terminating decimal if it has a finite number of digits after the decimal point and is a rational number. Additionally, if the simplified form of a rational number has a denominator with only powers of 2 and 5, then it will have a terminating decimal expansion. Terminating decimals can be expressed in the form $\frac{p}{q}$ where p and q are co-prime and the prime factorization of q is $2^m \times 5^n$ where m and n are non-negative integers. For example, 0.5 is equal to $\frac{1}{2}$. Non-terminating decimals, on the other hand, have infinite digits after the decimal point that do not terminate. These can be further divided into recurring and non-recurring decimals. Recurring decimals have a specific pattern of repeating digits after the decimal point, while non-recurring decimals do not follow a specific pattern. Examples of non-terminating decimals include 4.213213..., 2.34343434..., and 1.9999999.... Non-recurring decimals are irrational numbers that cannot be expressed as fractions. For instance, pi (π) is an irrational number represented by the decimal expansion 3.14159.... 1. A fraction can result in a terminating decimal if it can be expressed as $\frac{P}{q}$. where p and q are integers and the denominator is of the form $2^m \times 5^n$, where m and n are non-negative integers. 2. The given number 1.111 is a terminating decimal because it has an end-digit, i.e., only one digit after the decimal point. 3. Any rational number with its denominator in the form of $2^m \times 5^n$, where m and n are non-negative integers is a terminating decimal number. 4. The given decimal 5.348 can be expressed as $\frac{5348}{1000}$, which is in the form of p/q, so it's a terminating decimal. 5. The fraction $\frac{4}{3}$ results in a repeating decimal because its denominator is not of the form $2^m \times 5^n$, where m and n are non-negative integers. 6. Decimals are used in day-to-day life for measurements like length, weight, and volume where precision is required. 7. The fraction $\frac{1}{3}$ cannot be expressed as a terminating decimal because its denominator is of the form $2^m \times 5^n$, where m and n are non-negative integers. The digit 3 repeats infinitely in the number $0.\overline{3}$. Therefore, a fraction $\frac{1}{3}$ is equivalent to a recurring decimal. Is a terminating decimal a rational number? Yes, a rational number can be expressed as a terminating decimal in the form p/q. therefore non-ending decimal numbers have values after the decimal that go on forever. a key difference with usual non-ending decimals is the repeating nature of their decimal values, where one or more digits repeat themselves in a pattern. these repeating digits cannot be zeros. to convert repeating decimals into fractions, we use algebraic methods. let's say we have a repeating decimal number x, and it has n repeating digits. first, we multiply this number by 10^n. let y be the result of this multiplication: 10^n * x = y. next, we subtract 10^(n-1) * x from both sides to eliminate the decimal part and get an integer: 10^n * x - 10^(n-1) * x = a. here, a is the resulting integer value. then we solve for x by dividing a by (10^n - 10^(n-1)): x = a / (10^n - 10^(n-1)). thus, we can find the fraction equivalent of our repeating decimal number. let's look at some solved examples to better understand this method. A non-terminating decimal is a decimal that never ends, having an infinite number of digits. There are two types of non-terminating decimals: repeating and non-repeating. Repeating decimals have all their digits known, while non-repeating decimals do not have all their digits known. Non-terminating decimals can be expressed in different ways, such as using a "..." to show the pattern of repeating digits or a bar over the digits to indicate which ones repeat. A terminating decimal is one that has a finite number of digits. All of its digits are known, unlike non-terminating decimals. There are two types of repeating decimals: those with only one digit repeating and those with multiple digits repeating. The formula for converting repeating decimals to fractions varies depending on the type. Given article text here 0.00602 can be converted to a fraction using the formula for repeating decimals where some digits repeat. Since there are 3 digits that repeat and 2 digits that do not, we use the following formula: To convert this decimal to a fraction, we divide 602 by 99000. $\frac{1}{8}=0.125$ Let's explore the steps for long division where we divide 1 by 8 to get the quotient as 0.125. Here, the long division ends after a certain point and we obtain the remainder 0. We can identify a terminating decimal number using these conditions: It always has a finite number of digits after the decimal point. It is a rational number. If the simplified form of a rational number has a denominator in the form $2^m\times5^n$, where m and n are positive integers, then it has a terminating decimal expansion. More Worksheets If a rational number k has a terminating decimal expansion, then k can be expressed in the form $\frac{p}{q}$, such that $q\ne0$, where p and q are co-prime and the prime factorization of q is of the form $2^m\times5^n$, where m and n are non-negative integers. Example: $0.5=\frac{5}{10}=\frac{1}{2}$ If k=$\frac{p}{q}$is a rational number, where q ≠ 0 is a rational number with prime factorization $2^m\times5^n$, where m and n are non-negative integers, then k is a terminating decimal number. Example: $\frac{7}{8}=\frac{7}{2^3}=0.875$ These numbers are called non-terminating decimals because the digits after the decimal point do not terminate. This means that the digits after the decimal are infinite in number. These are further divided into two categories: Recurring Non-terminating Decimal Numbers: In these decimal numbers, the digits after the decimal point are infinite as well as repeating. This means the digits after the decimal place follow a specific pattern. For example, $4.213213....= 4.213$, $2.34343434....= 2.34$, $1.9999999....= 1.9$, etc. In these examples, one or more than one digit after the decimal keeps repeating. Non-recurring Non-terminating Decimal Numbers: In these decimal numbers, the digits after the decimal point are infinite as well as non-repeating. This means the digits after the decimal place do not follow a specific pattern. For example, 3.23447452..., 1.36098757..., 0.9374940..., etc. Such decimals fall under the category of irrational numbers. Let's explore the steps for long division where we divide 11 by 9. Here, the process of long division goes on. The remainder never becomes 0. Pi $(\pi) = 3.14159...$ is a non-terminating and non-repeating decimal number. It is an irrational number. Recurring decimal numbers can be written by putting a bar sign or dots over the digits repeating after the decimal point. Example: $1.66666....= 1.6$ Decimal numbers are of two types: terminating decimal numbers and non-terminating decimal numbers. Terminating decimals and non-terminating but recurring decimal numbers are called rational numbers and can be expressed as $\frac{P}{q}$, where q ≠ 0, p and q are integers. On the other hand, non-terminating and non-recurring decimals are called irrational numbers and cannot be expressed in the rational form. Let's solve a few examples based on the concept of terminating decimals. 1. Out of the given fractions $\frac{7}{5}, \frac{5}{15}, \frac{7}{42}$, and $\frac{4}{10}$, which one will result in a terminating decimal? Solution: The fractions can be expressed as: $\frac{7}{5}=1.4$ $\frac{5}{15}=0.333...$ $\frac{7}{42}=1.666...$ $\frac{4}{10}=0.4$ Therefore, the fraction resulting in terminating decimals are $\frac{4}{10}$ and $\frac{7}{5}$. 2. Is the decimal number 1.111 a terminating decimal? Solution: Terminating decimal is A decimal with a finite number of digits after the decimal point is considered a terminating decimal, such as 1.111. Rational numbers with denominators in the form of $2^m \times 5^n$, where m and n are non-negative integers, are also terminating decimals. For instance, 5.348 is a terminating decimal because it can be expressed as $\frac{5348}{1000}$. On the other hand, $\frac{4}{3}$ is a non-terminating decimal since it results in a repeating decimal, 1.333333.... A rational number can be expressed as a terminating decimal if it can be written in the form of $\frac{p}{q}$. Decimals are utilized in everyday life for measurements that require precision, such as length, weight, and volume. The fraction $\frac{1}{3}$ is equivalent to a recurring decimal, 0.333..., rather than a terminating decimal. A terminating decimal is a rational number, and examples include 17.28, 6.02, and 0.45. To determine if a number is terminating or non-terminating, divide the number and check the remainder; if it's zero, the decimal is terminating, otherwise, it's non-terminating. Terminating Decimals Are Rational Numbers Two chocolates eaten leave half a chocolate behind. The number of digits after the decimal point defines whether it's a terminating or non-terminating decimal. A terminating decimal has a finite number of digits after the decimal point, and all decimals that terminate are rational numbers. They can be written as fractions and are always in the form $\frac{p}{q}$, where $q = 0$, p and q are integers, and the prime factorization of q is of the form $2^m \times 5^n$. When dealing with decimals, it's essential to understand whether they are terminating or non-terminating. A terminating decimal is one that has an end-digit and can be expressed in the form of p/q, where m and n are non-negative integers and the denominator is in the form of 2^m * 5^n. On the other hand, a non-terminating decimal has an infinite number of digits after the decimal point. To determine if a fraction results in a terminating decimal, we can express it as a decimal and check for repeating or recurring patterns. For example, the fractions 7/5 = 1.4 and 5/15 = 0.333... are both terminating decimals because they have end-digits. However, not all rational numbers with a denominator in the form of 2^m * 5^n are terminating decimals. For instance, the fraction 4/3 is a non-terminating decimal because it has an infinite number of digits after the decimal point. In day-to-day life, decimals are used for measurements like length, weight, and volume. They help provide precision in measurement when required. But fractions like 1/3 are not equivalent to terminating decimals; instead, they represent recurring decimals. A rational number is indeed a terminating decimal number that can be expressed as p/q. Examples of terminating decimals include 0.8, which has only one digit after the decimal point, and 5.348, which can be expressed in the form of p/q by multiplying it by 1000. To find if a number is terminating or non-terminating, we can divide the number and check for a remainder. If the remainder is not equal to zero, then the number is a non-terminating decimal. It's worth noting that decimals like 1.111 are terminating decimals because they have a finite number of digits after the decimal point. In contrast, decimals with an infinite number of repeating or recurring patterns are considered non-terminating decimals. In a quiz to test knowledge on this topic, the correct answer would be: "Any rational number with its denominator in the form of 2^m * 5^n". The decimal representation of a certain value has an infinite sequence of digits.