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Product mean math

A product is the result of carrying out the mathematical operation of multiplication. When you multiply numbers together, you get their product. The other basic arithmetic operations are addition, subtraction and division; their results are the sum, the difference, and the quotient, respectively. Each operation also has special properties governing how the numbers can be arranged and combined. For multiplication, it's important to be aware of these properties so that you can multiply numbers and combine multiplication with other operations to get the right answer. The product meaning in math is the result of multiplying two or more numbers together. To get the right product, the following properties are important: * The order of the numbers doesn't matter. * Grouping the numbers with brackets has no effect. * Multiplying two numbers by a multiplier and then adding them is the same as multiplying their sum by the multiplier. * Multiplying by 1 leaves a number unchanged. The product of a number and one or more other numbers is the value obtained when the numbers are multiplied together. For example, the product of 2, 5 and 7 is \(2 \times 5 \times 7 = 70\) While the product obtained by multiplying specific numbers together is always the same, products are not unique. The product of 6 and 4 is always 24, but so is the product of 2 and 12, or 8 and 3. No matter which numbers you multiply to obtain a product, the multiplication operation has four properties that distinguish it from other basic arithmetic operations. Commutation means that the terms of an operation can be switched around, and that the sequence of the numbers makes no difference to the answer. When you obtain a product by multiplication, the order in which you multiply the numbers does not matter. The same is true of addition. You can multiply 8 × 2 to get 16, and you will get the same answer with 2 × 8. Similarly, 8 + 2 gives 10, the same answer as 2 + 8. Written generally, this means: \(a \times b \times c= b \times a \times c= c \times a \times b = \cdots\) Subtraction and division do not share the commutative property. If you change the order of the numbers, you'll get a different answer. For division, \(3 \div4 = 0.75 eq 4 \div3 = 1.33333\) \(For subtraction,\) \(7 – 5 = 2 eq 5 – 7 = -2\) Division and subtraction are not commutative operations. Distribution in math means that multiplying a sum by a multiplier gives the same answer as multiplying the individual numbers of the sum by the multiplier and then adding. For example, \(4 \times (3 + 6) = (4 \times3 + 4 \times 6) = 36\) Adding before multiplying gives the same answer as distributing the multiplier over the numbers to be added and then multiplying before adding. Division does not have the same distributive property: \(6 \div (3+9) eq 6 \div 3 + 6 \div 9\) Subtracting before dividing can give a different answer than dividing before subtracting. The associative property means that if you are performing an arithmetic operation on more than two numbers, you can associate or put brackets around two of the numbers without affecting the answer. Products and sums have the associative property while differences and quotients do not. For example, if an arithmetical operation is performed on the numbers 12, 4 and 2, the sum can be calculated as \(12 \times (4\times2) = 12 \times 8 = 96\) \(\ \text{or}\) \((12 \times 4) \times 2 = 48 \times 2 = 96\) But for quotients: \(12 \div (4 \div 2) eq (12 \div 4) \div 2\) and for differences: \(12 – (4 – 2) eq (12-4)-2\) Multiplication and addition have the associative property while division and subtraction do not. If you perform an arithmetic operation on a number and an operational identity, the number remains unchanged. All four basic arithmetic operations have identities, but they are not the same. For subtraction and addition, the identity is zero. For multiplication and division, the identity is one. The identity property for multiplication follows: \(a \times 1 = a\) Here is a more explicit multiplication problem: \(((24 \times 3) + 2 – 6)) \times 1 = ((24 \times 3) – 4) = 68\) All the properties for multiplication work for all real numbers, which includes all integers, positive numbers, negative numbers, decimals, and ratios. The basic arithmetic operations have vocabulary to describe what operation is happening to which numbers. For division and subtraction – where order and association matter – these words are very important, but for multiplication and addition these descriptors bear less importance. Multiplication When preforming multiplication, you multiply the multiplicand by the multiplier. However, since order doesn't matter, either number can be distinguished as each element. \(\begin{align*}\) \(&12 \ \ \leftarrow \text{multiplicand}\) \(\times & \ \ 8 \ \ \leftarrow \text{multiplier}\) \(\hline &96 \ \ \leftarrow \text{product}\) \(\end{align*}\) Division When preforming division you divide the divisor from the dividend to get the quotient. \(\begin{align*}\) \(&12 \ \ \leftarrow \text{dividend}\) \(\div & \ \ 8 \ \ \leftarrow \text{divisor}\) \(\hline &1.5 \ \ \leftarrow \text{quotient}\) \(\end{align*}\) We can also represent division as a fraction that still uses the original numbers, or they might be adjusted to be whole numbers (or reduced fractions). In this case, the dividend becomes the numerator and the divisor becomes the denominator. \(\begin{align*}\) \(12 \div 8\) \(&= \frac{12 \ \ \leftarrow \text{numerator}}{8 \ \ \leftarrow \text{denominator}} \\) \(&= \frac{3}{2} \ \ \leftarrow \text{ reduced fraction} \\) \(&= 1.5\) \(\end{align*}\) Addition When preforming addition you add the addends together to get the sum. \(\begin{align*}\) \(&12 \ \ \leftarrow \text{addend}\) \(+ & \ \ 8 \ \ \leftarrow \text{addend}\) \(\hline &20 \ \ \leftarrow \text{sum}\) \(\end{align*}\) Subtraction When preforming subtraction, you subtract the subtrahend from the minuend. \(\begin{align*}\) \(&12 \ \ \leftarrow \text{minuend}\) \(- & \ \ 8 \ \ \leftarrow \text{subtrahend}\) \(\hline &4 \ \ \leftarrow \text{difference}\) \(\end{align*}\) Products show up across many fields of math, and advanced math beyond high school will only continue to push the boundaries of mathematical operations and relationships. In set theory, there is a notion of a cartesian product between sets (think of sets of coordinates (x,y) in the xy cartesian plain. There are dot products in calculus, matrix products in linear algebra, and tensor products between vector spaces. The list can go and on, but these concepts all rely the same concept of some multiplication between factors (in the language that we have used these are the multiplicands and multipliers). Markgraf, Bert. "What Does The Word Product Mean In Math?" sciencing.com, . 22 July 2023. APA Markgraf, Bert. (2023, July 22). What Does The Word Product Mean In Math?. sciencing.com. Retrieved from Chicago Markgraf, Bert. What Does The Word Product Mean In Math? last modified July 22, 2023. The answer when two or more values are multiplied together. Try dragging the numerals to the blue boxes below to see the product: Share — copy and redistribute the material in any medium or format for any purpose, even commercially. Adapt — remix, transform, and build upon the material for any purpose, even commercially. The licensor cannot revoke these freedoms as long as you follow the license terms. Attribution — You must give appropriate credit , provide a link to the license, and indicate if changes were made . You may do so in any reasonable manner, but not in any way that suggests the licensor endorses you or your use. ShareAlike — If you remix, transform, or build upon the material, you must distribute your contributions under the same license as the original. No additional restrictions — You may not apply legal terms or technological measures that legally restrict others from doing anything the license permits. You do not have to comply with the license for elements of the material in the public domain or where your use is permitted by an applicable exception or limitation . No warranties are given. The license may not give you all of the permissions necessary for your intended use. For example, other rights such as publicity, privacy, or moral rights may limit how you use the material. Suppose you are at the bakery and you want to buy four cupcakes. When you reach there, you see that one cupcake costs $5. How will you calculate how much you should pay at the check-out counter? The concept of product in math helps you answer this and do much more! A product in math is defined as the result of two or more numbers when multiplied together. Let us consider the same scenario. You were running an errand at the bakery and had to buy 4 cupcakes. Each cupcake costs $5. To calculate the total amount you need to pay at the checkout counter, you can add the cost of each cupcake 4 times (as you need to buy 4 cupcakes). So, the answer will be 5 + 5 + 5 + 5 = $\$20 If you needed 10 cupcakes, you would have to add the cost 10 times. This is where the concept of multiplication and product can help you. In the previous answer, you can calculate the cost of 4 cupcakes by simply multiplying them, You can find the cost as, 4 times 5 or 4 × 5, You can skip count by 5, four times and get the answer as 20. A multiplicand is the number of objects in a group, and a multiplier is the number of such equal groups. Let's consider an example to understand this better. Suppose you have 3 baskets, and each basket has 6 oranges. How will you calculate the total number of oranges? This is when the concept of the product comes to our rescue! First, let us write this as a multiplication expression as: Number of groups × number of objects in each group or 3 × 6 So, we can find the total number of oranges by skipping counting by 6, three times, and that is 18. So we get, 3 × 6 = 18. This is a multiplication expression. A multiplication expression has three parts, a multiplier, a multiplicand, and the product. More Worksheets Interestingly, if the order of the multiplicand and multiplier are reversed, the product remains the same: Let's look at an example: 2 × 3 = 6 Here, 2 is the multiplicand, 3 is the multiplier, and 6 is the product. If we reverse the equation, we still get 3 × 2 = 6 Fascinating, isn't it? So far, we have learned how to calculate the product of whole numbers. Let's now learn how to find the product of fractions and decimals! Let's learn this with the help of an example. Suppose we have to find the product of the fractions 52 and 34. Step 1: Multiply the numerator with the numerator and the denominator with the denominator. Step 2: If you get an improper fraction, you can convert this into a mixed number. We can also find the product of two mixed numbers or a fraction and a mixed number or even a whole number and a fraction by the same method by just ensuring that we convert our multiplicand and multipliers into fraction form first. What makes a decimal number special?The decimal point!Multiplying two decimal numbers is the same as multiplying two whole numbers with the exception that we need to take care of the decimal point.Let's learn this with the help of an example. Let's multiply 1.5 and 1.2. Step 1: Count the number of digits after the decimal point in both the numbers. Step 2: So the total number of digits after the decimal point in our multiplication expression is 1 + 1 = 2. Step 3: Multiply the two numbers without the decimal point. Step 4: In this product, start from the right and place the decimal point, after the same number of places as the total number found in step 2. And that will be the answer to our decimal multiplication. So the product of 1.5 and 1.2 will be 1.80. Example 1: Jake has 4 boxes of apples. If 1 box has 3 apples, how many apples does he have? Solution: In this example, the multiplicand is 3 and the multiplier is 4. Hence, the total number of apples Jake has = the product of 4 and 3. or 4 × 3 = 12 Example 2: Calculate the product of $\frac{3}{7}$ and $\frac{5}{6}$. Solution: $\frac{3}{7} × \frac{5}{6} = \frac{3 × 5}{7 × 6} = \frac{15}{42}$ Example 3: Calculate the product of 125 and 34 . Solution: First, let's convert the mixed number into fraction form. So, multiplying $1\frac{2}{5}$ and $\frac{3}{4}$ is the same as multiplying $\frac{7}{5}$ and $\frac{3}{4}$. Following the steps of fraction multiplication, we get, $\frac{7}{5} × \frac{3}{4} = \frac{7 × 3}{5 × 4} = \frac{21}{20} = 1\frac{1}{20}$. Example 4: Calculate the product of 0.09 and 0.3. Solution.: First, let's count the number of decimal places. Number of decimal places in 0.09 = 2 Number of decimal places in 0.3 = 1 The total number of decimals places in the final answer = 2 + 1 = 3 Now let's multiply the two numbers without the decimal point: 9 × 3 = 27 Placing the decimal point from the right after 3 digits in this product, we get 0.027. Therefore, 0.09 × 0.3 = 0.027. Attend this quiz & Test your knowledge.Correct answer is: 24Here, the product will be number of groups × number of objects in each group 4 × 6 = 24Correct answer is: $1\frac{2}{12}$$\frac{7}{2} × \frac{4}{3} = \frac{7 × 2}{4 × 3} = \frac{14}{12} = \frac{12}{12}$.Correct answer is: 0.15Total number of decimals places = 1 + 1 = 2 Product without decimal point, 5 × 3 = 15 Therefore, 0.5 × 0.3 = 0.15.Both have an equal number of candiesCorrect answer is: Both have an equal number of candiesNumber of candies with Jimmy = 4 × 3 = 12 Number of candies with Joe = 3 × 4 = 12 Thus, both have an equal number of candies. What happens when you calculate the product of a number and 0? When you calculate the product of a number with 0, you get the answer as 0. For instance, 5 × 0 = 0; this is called the zero property of multiplication. What is a multiplicand and a multiplier? A multiplicand represents the number of equal groups, and a multiplier represents the number of objects in each group. For instance, consider the following equation: 2 × 7 = 14 Here, 2 is the multiplicand, 4 is the multiplier, and 14 is the product. What is the identity property of multiplication? It states that any number multiplied by 1 gives the same result as the number itself. For instance, 35× 1 = 35. home / primary math / multiplication / productA mathematical product is a term that describes the result of multiplication. This is true of both numbers as well as expressions. In the expressions below, (1) 4 × 3 = 12 (2) (x + 1)x2 = (x2 + x3) 12 is the product in (1), and in (2), the product is (x2 + x3). The term product is widely used throughout many different mathematical contexts. Some are closely related to arithmetic multiplication while others, like the product of two matrices, tensor products, cross products in 3D space, etc, can be far more complex. Product of natural numbers The first example, (1), above is an example of a product of natural numbers, one of the simplest types of product. Natural numbers cannot be negative (some definitions include 0 but others may only use the counting numbers). The product of natural numbers is just the result of a multiplication problem. Product of integers The product of integers is mostly the same as the product of natural numbers, except that negative values can be included. Below are the rules for multiplying positive and negative integers. Positive * Positive = Positive Negative * Negative = Positive Positive * Negative = Negative Negative * Positive = Negative Essentially, if there are an odd number of negative signs in the multiplication problem, the resulting value will be negative; if there are a positive number of negative signs, the number will be positive. The number of positive signs does not matter. There are many math terms that help us describe and solve problems in everyday life. One of these terms is "product," which is the basis for understanding multiplication. But what does product mean in math, and why is it so important? Simply put, a product results from multiplying two or more numbers. For example, if you multiply 2 and 3, the product is 6. This concept is one of the foundations of math, especially for kids who are just starting to learn multiplication. In this article, we will explore the product meaning in math, how to find the product in math, the product of fractions and decimals, and help you better understand the concept with solved examples of product. Whether you are a student, parent, or teacher, this guide will make understanding products in math simple and easy. Here is the definition of a product: In math, a product is the result obtained by multiplying numbers. The numbers being multiplied are called factors. Therefore, when we multiply factors together, whether they are whole numbers, fractions, or decimals, the final result of the multiplication operation is called the product. This concept is at the heart of many areas in math, which is why understanding the definition of product is so important. For example, if you multiply 6 by 3, the product is 18. To calculate the product of two or more numbers, multiply them together. The product of 9 and 3 is 27 because 9 × 3 = 27. The product of 9, 3, and 4 is 108 because 9 × 3 = 27 and 27 × 4 = 108. Since multiplication is an exchange operation, the numbers in the calculation can be in any order. Consider a simple example: To calculate the product of 2, 3, and 4, you can multiply them in any order. You can multiply 2 and 3 to get 6, then multiply 6 by 4 to get 24. Alternatively, you can multiply 4 and 2 to get 8, then multiply 8 by 3 to get 24. This flexibility is due to the commutative nature of multiplication, which means that the order of the numbers does not change the product. It is also important to remember that the mathematical product of any number and zero is always zero. This is the zero property of multiplication. When calculating fractions or decimals, the process is essentially the same. You can directly multiply fractions or decimals. However, calculating these operations may require extra steps or a good grasp of fractions and decimals. The concept of "product" is an essential math skill. Familiarity with the concept of "product" helps to make it easier to understand more advanced topics. Moreover, the "product" also has a wide range of applications in daily life, from calculating the price of multiple items to calculating the area of a room. Therefore, understanding "product" is not only useful for learning, but also for daily life! There are 4 properties of multiplication: Commutative property Associative property Multiplicative identity property Distributive property According to this property of multiplication, the order of the multiplier and the product does not matter. The product remains the same regardless of the order. The property is given as: a x b = b x a Let's find the product in the example given below: For example, a = 4 and b = 11 The product of a and b is a x b = 4x 11 = 44 If the order of a and b is exchanged, the product is b x a = 11 x 4 = 44 When three or more numbers are multiplied together, the product remains the same irrespective of the order of the numbers. The property is given as: (a x b) x c = (b x c) x a = (a x c) x b For example, a = 3, b = 5, and c = 7 The product of a, b, and c is a x b x c = 3 x 5 x 7 = 105 If initially a and b were multiplied and then c was multiplied, the product would be given as(a x b) x c = (3 x 5) x 7 = 15 x 7 =105 If initially b and c were multiplied and then a was multiplied, the product would be given as(b x c) x a = (5 x 7) x 3 = 35 x 3 = 105 Similarly, If initially a and c were multiplied and then b was multiplied, the product would be given as(a x c) x b = (3 x 7) x 5 = 21 x 5 = 105 By this property, any number multiplied by 1 gives the number itself. The property is as follows: a x (1) = a For example, when 2 is multiplied by 1, the product is 2, which is the number itself. The sum of any two numbers multiplied by a third number can be expressed as the sum of each additive number multiplied by the third number. This property is expressed as: a x (b + c) = (a x b) + (a x c) Let's try finding the product for this case. For example, a = 2, b = 4, and c = 6 Applying distributive property, we get a x (b + c) = 2 x (4 + 6) = 2 x 10 = 20 As per the property, (a x b) + (a x c) = (2 x 4) + (2 x 6) = 8 + 12 = 20 So far, we've learned how to calculate the product of whole numbers. Now we will learn how to find the product of fractions and decimals! Let us learn this concept with the help of an example. Suppose we ask for the product of the fractions 5/2 and 3/4. Step 1: Multiply the numerator by the numerator and the denominator by the denominator. Step 2: If you get an improper fraction, you can convert this into a mixed number. We can also use the same method to find the product of two mixed numbers, a fraction and a mixed number, or even a whole number and a fraction, just make sure to convert the multiplier and the multiplicand into fraction form first. What makes decimals different? The answer is the decimal point! Multiplying two decimals is the same as multiplying two whole numbers, the difference being that we need to pay attention to the decimal point. Here is an example to make it easier for you to understand: calculate the multiplication of 1.5 and 1.2. Step 1: Count the number of digits after the decimal point in both numbers.Both 1.5 and 1.2 are one digit after the decimal point. Step 2: So the total number of digits after the decimal point in our multiplication expression is 1 + 1 = 2. Step 3: Multiply the two numbers without the decimal point.15 x 12 = 180 Step 4: In this product, starting from the right, place the decimal point after the same number of places as the total found in Step 2. This is the answer to multiplying decimals.Therefore, after 2 digits from the right of 180, the product is 1.80 Thus, the product of 1.5 and 1.2 will be 1.8. Example 1: Tom has 4 boxes of apples. If 1 box has 3 apples, how many apples does he have? Solution: In this example, the multiplicand is 3 and the multiplier is 4. Hence, the total number of apples Tom has = the product of 4 and 3, or 4 × 3 = 12 Example 2: Calculate the product of 0.06 and 0.3. Solution: First, let's calculate the number of decimal places. Number of decimal places for 0.06 = 2 Number of decimal places for 0.3 = 1 Total number of decimal places in the final answer = 2 + 1 = 3 Now let's multiply the two numbers without the decimal point: 6 × 3 = 18 Putting the decimal point from the right after the 3 digits of this product, we get 0.018. The final product is 0.06 × 0.3 = 0.018. Example 3: What is the product of the numbers "n" and "(n+1)"? Help Jake find it. Solution: In this case, the number "n" is the multiplier, and "(n+1)" is the product. The product is n x (n + 1) Applying distributive property of multiplication, Jake will get n x (n + 1) = (n x n) + (n x 1) = n^2 + n Jake finds that the product is n^2 + n The two numbers which have sum 15 and product 36 are 12 and 3. When you calculate the product of a number with 0, you get the answer as 0. For instance, 7 × 0 = 0; this is called the zero property of multiplication. The product of the first 50 whole numbers is 0. The concept of product in mathematics is a fundamental building block that students encounter throughout their studies. With this study, you will now be able to easily solve problems in math such as products, finding products, and what a product is. For students, mastering this concept requires practice and familiarity with the rules of multiplication. Remember, the more you practice, the easier it will be to calculate and understand multiplication in math. So, keep practicing and soon, solving problems involving products will become easy! 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