

Correct Answer Gets BrainlestSelect All Of The Expressions That Could Represent 19×50 Using distributive

Correct Answer Gets BrainlestSelect All Of The Expressions That Could Represent 19×50 Using distributive

Understanding how to express multiplication problems using the distributive property is a fundamental skill in mathematics that enhances comprehension and problem-solving efficiency. In this article, we will explore the various expressions that can represent the multiplication 19×50 by applying the distributive property, analyze their equivalence, and provide guidance on identifying correct representations. Whether you are a student, educator, or math enthusiast, mastering the distributive property is essential for simplifying complex calculations and reinforcing algebraic concepts.

What Is the Distributive Property?

Definition and Explanation

The distributive property states that for any three numbers a , b , and c :

$$a \times (b + c) = (a \times b) + (a \times c)$$

This property allows us to break down complex multiplication expressions involving addition into simpler parts, making calculations more manageable. It is fundamental in algebra, especially when expanding expressions or simplifying equations.

Application in Multiplication

When multiplying a number by a sum, the distributive property allows us to distribute the multiplication over each addend:

$$a \times (b + c) = a \times b + a \times c$$

Conversely, it can be used to factor expressions or to break down a large multiplication into easier components.

Expressing 19×50 Using the Distributive Property

Breaking Down 19×50

To apply the distributive property to 19×50 , we can decompose 19 into smaller, more manageable

parts. For example:

$$19 = 10 + 9$$

Using this decomposition, the multiplication becomes:

$$19 \times 50 = (10 + 9) \times 50$$

Applying the distributive property:

$$(10 \times 50) + (9 \times 50)$$

Calculating each term:

$$10 \times 50 = 500$$

$$9 \times 50 = 450$$

Adding these results:

$$500 + 450 = 950$$

Thus, the original multiplication can be expressed as the sum of two products, illustrating the distributive property.

All Possible Expressions Using the Distributive Property

Now, let's explore all the expressions that could represent 19×50 using the distributive property. These expressions must be equivalent to 950, and they should demonstrate the distributive property explicitly.

1. Standard Decomposition of 19

- Expression: $(10 + 9) \times 50$
- Expanded Form: $(10 \times 50) + (9 \times 50)$

2. Alternative Decomposition of 19

- Expression: $(20 - 1) \times 50$
- Expanded Form: $(20 \times 50) - (1 \times 50)$

Calculations:

- $20 \times 50 = 1000$
- $1 \times 50 = 50$
- Result: $1000 - 50 = 950$

3. Decomposition of 50

- Expression: $19 \times (30 + 20)$
- Expanded Form: $(19 \times 30) + (19 \times 20)$

Calculations:

- $19 \times 30 = 570$
- $19 \times 20 = 380$
- Sum: $570 + 380 = 950$

4. Alternative Decomposition of 50

- Expression: $19 \times (25 + 25)$
- Expanded Form: $(19 \times 25) + (19 \times 25)$

Calculations:

- $19 \times 25 = 475$
- Sum: $475 + 475 = 950$

5. Using Halves

- Expression: $19 \times (40 + 10)$
- Expanded Form: $(19 \times 40) + (19 \times 10)$

Calculations:

- $19 \times 40 = 760$
- $19 \times 10 = 190$
- Sum: $760 + 190 = 950$

Identifying Correct Expressions

Criteria for Valid Expressions

To determine whether an expression correctly represents 19×50 using the distributive property, it must meet the following criteria:

- Equality: The expression evaluates to 950.
- Use of Distributive Property: The expression explicitly shows the multiplication over a sum or difference.
- Correct Decomposition: The parts used in the expression sum to 19 and 50, respectively, or are valid algebraic manipulations.

Examples of Valid Expressions

- $(10 + 9) \times 50$
- $(20 - 1) \times 50$
- $19 \times (30 + 20)$
- $19 \times (25 + 25)$
- $19 \times (40 + 10)$

All of these expressions satisfy the criteria, as they are equivalent to 950 and demonstrate the distributive property.

Examples of Invalid Expressions

- 19×45 (without any decomposition)
- $(19 + 1) \times 50$
- 19×50 (no decomposition, but technically correct as a multiplication)
- 950 (just the product, not an expression demonstrating distributive property)

While the last one is the result, it does not show the distributive property explicitly.

Why Use the Distributive Property?

Benefits in Mathematics

Applying the distributive property simplifies calculations, especially with larger numbers, and helps in understanding algebraic concepts such as factoring and expanding expressions.

Practical Applications

- Simplifying mental math
- Solving algebraic equations
- Factoring expressions in algebra
- Performing polynomial multiplication

Example Problems and Practice

Practice Problem 1

Express 19×50 using the distributive property with the decomposition $19 = 15 + 4$.

Solution:

$$[(15 + 4) \times 50 = (15 \times 50) + (4 \times 50) = 750 + 200 = 950]$$

Practice Problem 2

Express 19×50 using the decomposition $19 = 17 + 2$.

Solution:

$$[(17 + 2) \times 50 = (17 \times 50) + (2 \times 50) = 850 + 100 = 950]$$

Practice Problem 3

Express 19×50 using the decomposition $50 = 45 + 5$.

Solution:

$$19 \times (45 + 5) = (19 \times 45) + (19 \times 5) = 855 + 95 = 950$$

Conclusion

Applying the distributive property to express 19×50 reveals multiple valid representations, each demonstrating the core principle of breaking down complex multiplication into simpler parts. The key expressions include decompositions of 19 and 50 into sums or differences, such as $(10 + 9) \times 50$, $(20 - 1) \times 50$, and $19 \times (30 + 20)$. Recognizing these different forms enhances understanding, aids in mental math, and deepens algebraic comprehension. Mastery of the distributive property is an essential step toward more advanced mathematical concepts and problem-solving techniques.

By practicing these various expressions, students can build confidence and develop a flexible approach to multiplication and algebraic manipulations, paving the way for success in higher-level mathematics.

Frequently Asked Questions

Which of the following expressions correctly represent 19×50 using the distributive property?

$$19 \times 50 = (10 + 9) \times 50 = (10 \times 50) + (9 \times 50)$$

How can the distributive property be used to simplify 19×50 ?

By expressing 19 as $10 + 9$, so $19 \times 50 = (10 + 9) \times 50 = (10 \times 50) + (9 \times 50)$

Which of these expressions is an application of the distributive property for 19×50 ?

$$19 \times 50 = (10 + 9) \times 50 = (10 \times 50) + (9 \times 50)$$

Select all expressions that correctly apply the distributive property to 19 times 50.

Is the expression 19×50 equal to $10 \times 50 + 9 \times 50$? Why or why not?

Yes, because by the distributive property, $(10 + 9) \times 50 = 10 \times 50 + 9 \times 50$, which equals 19×50 .

Can the distributive property be used to break down 19×50 into simpler parts? If so, how?

Yes, by rewriting 19 as $10 + 9$, so 19×50 becomes $(10 + 9) \times 50$, which equals $(10 \times 50) + (9 \times 50)$.

What is one correct way to represent 19×50 using the distributive property?

$$19 \times 50 = (10 + 9) \times 50 = (10 \times 50) + (9 \times 50)$$

Additional Resources

Correct Answer Gets Brainlest
Select All Of The Expressions That Could Represent 19×50
Using distributive

Understanding the Distributive Property in Mathematics

Mathematics is often viewed as a universal language, with properties and principles that help simplify complex calculations. One of the foundational concepts in algebra and arithmetic is the distributive property. This property allows us to multiply a single term by each term within a parentheses, making it easier to evaluate expressions and solve equations efficiently.

What Is the Distributive Property?

The distributive property states that:

$$[a \times (b + c) = (a \times b) + (a \times c)]$$

In words, multiplying a sum by a number yields the same result as multiplying each addend individually and then summing the products. This principle is fundamental in algebra because it provides a systematic way to expand and simplify expressions.

Why Is the Distributive Property Important?

- Simplification: It helps break down complex expressions into simpler parts.
- Flexibility: It allows you to manipulate expressions in ways that make calculations easier.
- Foundation for Factoring: The property is crucial when factoring expressions in algebra.
- Real-world Applications: It applies in various contexts, such as calculating areas, distributing resources, and solving equations.

In the context of the multiplication problem 19×50 , the distributive property can be used to decompose 19 into parts that are easier to multiply by 50, thus demonstrating multiple equivalent

expressions.

Breaking Down 19×50 Using Distributive Property

The challenge is to find all expressions that correctly represent the multiplication 19×50 using the distributive property. The key here is recognizing that 19 can be split into parts, such as $10 + 9$, which simplifies the multiplication process.

Step-by-Step Approach

1. Express 19 as a sum of convenient numbers:

- $10 + 9$

- $20 - 1$

- $15 + 4$

2. Apply the distributive property to each decomposition:

- Using $10 + 9$:

$$[19 \times 50 = (10 + 9) \times 50 = (10 \times 50) + (9 \times 50)]$$

- Using $20 - 1$:

$$[19 \times 50 = (20 - 1) \times 50 = (20 \times 50) - (1 \times 50)]$$

- Using $15 + 4$:

$$[19 \times 50 = (15 + 4) \times 50 = (15 \times 50) + (4 \times 50)]$$

3. Calculate each expression:

- $(10 \times 50 = 500)$

- $(9 \times 50 = 450)$

- $(20 \times 50 = 1000)$

- $(1 \times 50 = 50)$

- $(15 \times 50 = 750)$

- $(4 \times 50 = 200)$

4. Express the original multiplication as the sum or difference of these products:

- $((10 \times 50) + (9 \times 50) = 500 + 450 = 950)$

- $((20 \times 50) - (1 \times 50) = 1000 - 50 = 950)$

- $((15 \times 50) + (4 \times 50) = 750 + 200 = 950)$

All these expressions are valid representations of 19×50 using the distributive property, and they all evaluate to 950.

Identifying All Valid Expressions for 19×50 Using the

Distributive Property

Given the explanation above, the core task is to identify all mathematical expressions that correctly represent 19×50 by applying the distributive property. Let's explore this systematically.

Basic Principles for Multiple Expressions

- Decompose 19 into any sum or difference of two numbers that sum to 19.
- Apply the distributive property accordingly.
- Ensure the expression correctly simplifies to 950.

Common Decompositions of 19

1. Using 10 and 9:

$$\lfloor (10 + 9) \times 50 \rfloor$$

2. Using 20 and -1:

$$\lfloor (20 - 1) \times 50 \rfloor$$

3. Using 15 and 4:

$$\lfloor (15 + 4) \times 50 \rfloor$$

4. Using 25 and -6:

$$\lfloor (25 - 6) \times 50 \rfloor$$

5. Using 18 and 1:

$$\lfloor (18 + 1) \times 50 \rfloor$$

6. Using 30 and -11:

$$\lfloor (30 - 11) \times 50 \rfloor$$

Each of these decompositions, when multiplied using the distributive property, yields:

$$\lfloor (a + b) \times 50 = (a \times 50) + (b \times 50) \rfloor$$

$$\lfloor (a - b) \times 50 = (a \times 50) - (b \times 50) \rfloor$$

Examples:

$$\lfloor (10 + 9) \times 50 = (10 \times 50) + (9 \times 50) = 500 + 450 = 950 \rfloor$$

$$\lfloor (20 - 1) \times 50 = (20 \times 50) - (1 \times 50) = 1000 - 50 = 950 \rfloor$$

$$\lfloor (15 + 4) \times 50 = 750 + 200 = 950 \rfloor$$

$$\lfloor (25 - 6) \times 50 = 1250 - 300 = 950 \rfloor$$

$$\lfloor (18 + 1) \times 50 = 900 + 50 = 950 \rfloor$$

$$\lfloor (30 - 11) \times 50 = 1500 - 550 = 950 \rfloor$$

Formal List of Valid Expressions

Based on the above, the expressions that correctly represent 19×50 using the distributive property include:

$$\lfloor (10 + 9) \times 50 \rfloor$$

$$\lfloor (20 - 1) \times 50 \rfloor$$

$$\lfloor (15 + 4) \times 50 \rfloor$$

$$\lfloor (25 - 6) \times 50 \rfloor$$

$$\lfloor (18 + 1) \times 50 \rfloor$$

- $(30 - 11) \times 50$

Note: Any other decomposition of 19 into two numbers that sum or differ to 19, and whose products with 50 are easily computed, can also be used to generate valid expressions.

Why Multiple Expressions Matter in Learning and Application

The ability to express a multiplication problem in multiple ways using the distributive property is more than an academic exercise; it's a vital skill that fosters flexible thinking and problem-solving agility.

Educational Significance

- Deepens Conceptual Understanding: Recognizing various valid decompositions helps students understand the structure of numbers and operations.
- Promotes Mental Math: Decompositions like 19 as $10 + 9$ or $20 - 1$ simplify calculations, aiding mental computation.
- Builds Algebraic Fluency: Understanding how to manipulate expressions using properties like distributive is foundational for algebra.
- Encourages Creativity: Students learn that numbers can be broken down in multiple ways, fostering a flexible approach to mathematics.

Practical Applications

- Financial Calculations: Distributing costs or resources efficiently.
- Area and Volume Calculations: Breaking down complex shapes into manageable parts.
- Coding and Algorithm Design: Implementing algorithms that utilize distributive-like operations for optimization.

Summary and Key Takeaways

- The distributive property allows multiplication to be distributed over addition or subtraction, simplifying calculations.
- For 19×50 , multiple valid expressions exist, each decomposing 19 into different sums or differences that make the multiplication straightforward.
- Examples include $(10 + 9) \times 50$, $(20 - 1) \times 50$, and $(15 + 4) \times 50$ among others.
- Recognizing various valid expressions enhances mathematical understanding, supports mental math, and develops algebraic fluency.

Final thoughts:

Mastering the application of the distributive property, especially in expressions like 19×50 , empowers learners to approach mathematical problems with flexibility and confidence. By understanding the principles and exploring multiple representations, students and practitioners can simplify complex calculations, verify results through different methods, and develop a deeper appreciation for the elegance of mathematics.

Note: When presented with multiple-choice questions or exercises asking to select all expressions that correctly represent 19×50 via the distributive property, look for expressions that:

- Accurately decompose 19 into parts whose sum/difference is 19.
- Apply the distributive property correctly.
- Simplify to the product 950.

This approach ensures a comprehensive understanding and accurate selection of the correct expressions.

Correct Answer Gets Brainleselect All Of The Expressions That Could Represent 19×50 Using distributive

Correct Answer Gets Brainleselect All Of The Expressions That Could Represent 19×50 Using distributive

Related Articles

- [How Did President Andrew Johnson's Plan For Reconstruction Differ From That Of The Radical Republicans?](#)
- [Considering The Specific Undergraduate School You Have Selected, How Will You Explore Your Academic And](#)
- [Consider The Reaction Of A 20.0 Ml Of 0.220 M Chnhcl \(\$k_a = 5.9 \times 10\$ \) With 12.0 Ml Of 0.241 M Csoh. What](#)

[Back to Home](#)