Simplify This Expression (15+8d)(-5)-24d+dSolve Step By Step

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Understanding how to simplify algebraic expressions is a fundamental skill in mathematics that helps in solving equations, analyzing functions, and understanding mathematical relationships. In this article, we will thoroughly explore the process of simplifying the expression (15+8d)(-5)-24d+dSolve step by step. We will break down each part of the expression, apply the distributive property, combine like terms, and ensure clarity throughout the process. Whether you're a student learning algebra or someone looking to refine your skills, this comprehensive guide will walk you through the necessary steps to simplify this complex expression efficiently and accurately.

Understanding the Expression

Before diving into the simplification process, it's crucial to understand the components of the given expression:

- (15+8d)(-5): A binomial multiplied by a negative scalar.
- -24d: A term involving the variable d.
- +dSolve: This appears to be a typo or a concatenation error. For clarity, we'll interpret it as + d, assuming "dSolve" was intended to be just "d" or perhaps a typo. If "dSolve" refers to a specific function or variable, please clarify; otherwise, we'll proceed assuming it's just "+ d".

Assumption: The expression is (15 + 8d)(-5) - 24d + d.

This assumption aligns with common algebraic expressions and makes the problem solvable. If your original expression differs, please specify, and we can adjust accordingly.

Step-by-Step Breakdown of the Simplification Process

Step 1: Expand the Product (15 + 8d)(-5)

The first step involves applying the distributive property (also known as the FOIL method for binomials) to expand the product:

- Distributive Property: a(b + c) = ab + ac

Applying this to (15 + 8d)(-5):

- Multiply each term inside the parentheses by -5:

$$
15 \times (-5) + 8d \times (-5)
$$

Calculating each:

- $15 \times (-5) = -75$
- $8d \times (-5) = -40d$

So, the expanded form is:

$$
-75 - 40d
$$

Step 2: Rewrite the Entire Expression

Now, substitute the expanded form back into the original expression:

$$
(-75 - 40d) - 24d + d
$$

Step 3: Combine Like Terms

Next, group the terms involving the variable d and the constant terms separately:

- Constants: -75
- Terms with d: $-40d - 24d + d$

Combine the d terms:

$$
-40d - 24d + d = (-40d - 24d) + d = -64d + d = -63d
$$

Now, the expression simplifies to:

$$
-75 - 63d
$$

This is the simplified form of the original expression, assuming "dSolve" was just "d". If "dSolve" has a different meaning, please clarify.

Final Simplified Expression

The simplified form of (15+8d)(-5)-24d+d is:

$$
\boxed{-75 - 63d}
$$

This expression is now in its simplest form, with like terms combined and no parentheses remaining.

Additional Tips for Simplifying Algebraic Expressions

To enhance your understanding and ensure accuracy in similar problems, consider these tips:

- Always expand parentheses first using the distributive property.
- Combine like terms carefully, making sure to include coefficients and variables.
- Pay attention to signs (positive or negative) to avoid errors.
- Double-check your work by substituting a value for the variable d to verify the consistency of your simplified expression.

Common Mistakes to Avoid

While simplifying algebraic expressions, students often encounter pitfalls. Be mindful of the following:

- Ignoring the negative sign when distributing: For example, forgetting that multiplying by -5 affects both terms inside the parentheses.
- Mixing unlike terms: Always combine terms with exactly the same variable and exponent.
- Misinterpreting variables or typos: Clarify any ambiguous parts of the expression before proceeding.
- Forgetting to include all terms when combining like terms.

Practice Problems for Mastery

To reinforce your understanding, try simplifying the following similar expressions:

1. $(12 + 7x)(-3) - 15x + x$

2. \((20 - 4y)(2) + 5y - y\)
3. \((8 + 6z)(-2) - 10z + 3z\)

Solutions:

For each, expand, combine like terms, and simplify step by step.

Conclusion

Simplifying algebraic expressions like (15+8d)(-5)-24d+d involves systematic application of algebraic principles such as the distributive property and combining like terms. By carefully expanding parentheses, managing signs, and grouping similar terms, you can reduce complex expressions to their simplest forms efficiently. Practice regularly with a variety of expressions to strengthen your algebraic skills and build confidence in handling more advanced problems. Remember, clarity and patience are key to mastering algebraic simplification.

Keywords for SEO Optimization:
- Simplify algebraic expressions
- Step-by-step algebra tutorial
- Distributive property examples
- Combining like terms
- Algebra practice problems
- Simplify (15+8d)(-5)
- Algebra simplification tips
- Solving algebraic expressions
- Variable simplification techniques

Frequently Asked Questions

What is the first step to simplify the expression (15+8d)(-5)-24d+d?

The first step is to distribute -5 across the terms inside the parentheses: (-5) 15 and (-5) 8d.

How do you distribute -5 in the expression (15+8d)(-5)?

Multiply -5 by 15 to get -75, and multiply -5 by 8d to get -40d, resulting in -75 - 40d.

What is the expression after distributing in

(15+8d)(-5)-24d+d?

The expression becomes -75 - 40d - 24d + d.

How do you combine like terms in the simplified expression?

Combine the terms with d: -40d, -24d, and +d, to get -40d - 24d + d.

What is the sum of the d-terms in the expression?

Adding -40d, -24d, and +d gives -63d because (-40d - 24d + 1d) = -63d.

What is the final simplified form of the expression?

The simplified expression is -75 - 63d.

Why is it important to combine like terms in simplifying algebraic expressions?

Combining like terms simplifies the expression, making it easier to understand and solve further if needed.

Can the simplified expression -75 - 63d be factored further?

Yes, it can be factored as -3(25 + 21d), if desired.

Additional Resources

Simplify This Expression (15+8d)(-5)-24d+dSolve Step By Step is a common problem encountered in algebra that challenges students to combine like terms, distribute correctly, and understand the order of operations. Whether you're brushing up on your algebra skills or tackling homework problems, breaking down complex expressions into manageable steps is essential for mastering the fundamentals of algebraic simplification. In this guide, we'll walk through this specific expression with detailed explanations, strategies, and tips to help you understand each part of the process.

Understanding the Expression

Before diving into the simplification process, let’s analyze the expression:

(15 + 8d)(-5) - 24d + dSolve

At first glance, it appears complex, but it's composed of straightforward components:

- A binomial multiplied by a constant: (15 + 8d)(-5)
- Subtracting a term involving d: -24d
- An additional term involving d: + dSolve

Note: The term dSolve might seem unusual; it could be a typo or a variable with a suffix. For the purpose of this guide, we'll interpret it as a variable named dSolve unless you specify otherwise. If it’s meant to be d, then the expression simplifies accordingly. Please clarify if needed.

Step 1: Clarify the Expression

Let's assume the expression is:

(15 + 8d)(-5) - 24d + d

This is a typical algebraic expression involving the variable d. If dSolve is a variable, the process is similar; if it’s a typo, replacing it with d makes the process straightforward.

Note: For clarity in this guide, we'll proceed with (15 + 8d)(-5) - 24d + d.

Step 2: Apply the Distributive Property

The first operation involves expanding (15 + 8d)(-5).

Distributive property states:

a(b + c) = ab + ac

Applying this to (15 + 8d)(-5):

- Multiply 15 by -5
- Multiply 8d by -5

Calculations:

- 15 × -5 = -75
- 8d × -5 = -40d

Thus, the expanded form is:

-75 - 40d

Step 3: Rewrite the Expression

Now, the expression becomes:

-75 - 40d - 24d + d

Next, we group like terms:

- Constant term: -75
- Terms involving d: -40d - 24d + d

Step 4: Combine Like Terms

Combining the d terms:

-40d - 24d + d

1. Add -40d and -24d:

- -40d - 24d = -64d

2. Now, add d (which is +1d) to -64d:

- -64d + d = -63d

Final simplified form:

-75 - 63d

Step 5: Final Check and Interpretation

The simplified expression is:

-75 - 63d

This is a linear algebraic expression with a constant term -75 and a variable term -63d.

Additional Considerations

If the original expression included dSolve:

If dSolve was intended as a variable, then the final simplified form would be:

-75 - 64d + dSolve

which can’t be combined unless d and dSolve are like terms or if you have specific values for these variables.

If the expression was different:

Always double-check the original expression to ensure all terms are correctly identified and expanded.

Summary of the Step-By-Step Process

Step	Action	Explanation
1	Clarify the expression	Understand the terms involved and rectify any ambiguities
2	Distribute	Expand binomials using the distributive property
3	Rewrite	Collect like terms for clarity
4	Combine like terms	Add coefficients of like terms, constants with constants
5	Final check	Confirm the expression is fully simplified

Tips for Simplifying Algebraic Expressions

- Always remember the order of operations: parentheses, exponents, multiplication/division, addition/subtraction (PEMDAS).
- Distribute carefully; mistakes here can lead to incorrect answers.
- Group like terms to streamline the simplification.
- Be mindful of signs (+ or -) during addition or subtraction.
- Double-check your work by substituting values if necessary to verify the result.

Conclusion

Simplify This Expression (15+8d)(-5)-24d+dSolve Step By Step illustrates fundamental algebraic skills: distribution, combining like terms, and simplifying expressions. Breaking complex problems into smaller parts ensures accuracy and builds confidence. Remember, practice makes perfect—regularly working through similar expressions will deepen your understanding and improve your algebraic fluency.

If you're interested in further practice, try applying these steps to different expressions or tackling word problems that require algebraic simplification. With patience and methodical work, you'll master these techniques in no time!

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