

The Fully Simplified Form Of $2ab(8a)$ Is: A) $\frac{2ab}{8a}$ B) $\frac{4}{b}$ C) $\frac{b}{4}$

The Fully Simplified Form Of $2ab(8a)$ Is: A) $\frac{2ab}{8a}$ B) $\frac{4}{b}$ C) $\frac{b}{4}$

Understanding how to simplify algebraic expressions is a fundamental skill in mathematics. In particular, simplifying expressions involving variables and coefficients helps to make complex problems more manageable and sets the foundation for higher-level math topics such as algebra, calculus, and beyond. Today, we will explore the expression $2ab(8a)$ and determine its fully simplified form among the provided options:

- A) $\frac{2ab}{8a}$
- B) $\frac{4}{b}$
- C) $\frac{b}{4}$

By the end of this article, you'll understand how to approach such problems systematically, use algebraic properties effectively, and confidently select the correct simplified expression.

Understanding the Expression: $2ab(8a)$

Before diving into simplification, it's essential to understand the components of the expression:

- $2ab$: A coefficient (2) multiplied by variables a and b .
- $(8a)$: A coefficient (8) multiplied by variable a .

When these are multiplied together, the expression becomes:

$$2ab \times 8a$$

The key to simplifying such an expression is to apply algebraic multiplication rules and combine like terms where possible.

Step-by-Step Simplification Process

Let's break down the process systematically:

1. Write the Expression Explicitly

$$2ab \times 8a$$

This is a multiplication of two algebraic terms.

2. Apply the Associative and Commutative Properties

Multiplication of algebraic terms allows us to rearrange and regroup factors:

$$(2 \times 8) \times (a \times a \times b)$$

- Multiply the coefficients: $(2 \times 8 = 16)$
- Multiply variables: $(a \times a = a^2)$

Thus, the expression simplifies to:

$$16 \times a^2 \times b$$

or written as:

$$16a^2b$$

3. Recognize the Simplified Form

The simplified form of $2ab(8a)$ is $16a^2b$.

Analyzing the Given Options

Now, let's analyze the options provided:

- Option A) $\frac{2ab}{8a}$
- Option B) $\frac{4}{b}$
- Option C) $\frac{b}{4}$

Our goal is to determine which of these options is equivalent to the fully simplified form $16a^2b$.

Evaluating Each Option

Option A: $\frac{2ab}{8a}$

Let's simplify this fraction:

$$\frac{2ab}{8a}$$

- Divide numerator and denominator by common factors:

$$\frac{2ab}{8a} = \frac{(2 \times a \times b)}{(8 \times a)}$$

- Cancel common factors:

$$\frac{2 \times \cancel{a} \times b}{8 \times \cancel{a}} = \frac{2b}{8}$$

- Simplify numerator and denominator:

$$\frac{2b}{8} = \frac{b}{4}$$

So, Option A simplifies to $\frac{b}{4}$, which is Option C.

Option B: $\frac{4}{b}$

This is a simple fraction with numerator 4 and denominator b . It does not resemble the fully simplified form $16a^2b$, which involves a^2 and a coefficient of 16. Since these do not match, Option B is not equivalent to the fully simplified expression.

Option C: $\frac{b}{4}$

This was obtained after simplifying Option A, but it does not match the fully simplified form $16a^2b$. It is a different expression altogether.

Conclusion: Which Option Is Correct?

From the above analysis:

- Our fully simplified form of the original expression $2ab(8a)$ is $16a^2b$.
- None of the options directly corresponds to $16a^2b$.
- Option A, when simplified, results in $\frac{b}{4}$, which does not match the fully simplified form.
- Option B ($\frac{4}{b}$) is unrelated.
- Option C ($\frac{b}{4}$) is also unrelated to the fully simplified form.

However, considering the options given and the process of simplification, the initial expression $2ab(8a)$ simplifies to $16a^2b$, which does not match any of the options directly.

Additional Insights and Clarifications

Why are the options provided potentially confusing?

Often in algebraic problems, options are designed to test understanding of simplification and algebraic manipulation. The options provided can represent different stages or types of expressions, but only one matches the fully simplified form.

In this case, the options seem to be designed to test the student's ability to manipulate fractions and variables.

Key Takeaways:

- When multiplying algebraic expressions, multiply coefficients and variables separately.
- Use the properties of exponents to simplify powers of variables.
- Cancel common factors when simplifying fractions.
- Always compare the fully simplified form to the options to determine the correct choice.

Summary and Final Remarks

- The expression $2ab(8a)$ simplifies to $16a^2b$.
- Options A, B, and C are different algebraic expressions, with Option A simplifying to $\frac{b}{4}$.
- None of the options directly matches the fully simplified form $16a^2b$, indicating a possible mismatch or a trick question.

In conclusion, understanding the process of algebraic simplification is crucial. Always carefully expand, combine like terms, and reduce fractions to identify the correct simplified form.

Additional Resources for Learning Algebra Simplification

- Algebra Basics: Understanding variables, coefficients, and exponents.
- Simplifying Expressions: Techniques for expanding and reducing algebraic expressions.
- Fraction Simplification: Learning how to cancel common factors.
- Practice Problems: Applying these concepts to reinforce understanding.

By mastering these skills, you'll be well-equipped to handle similar problems confidently and accurately.

Remember: Practice makes perfect. The more you work with algebraic expressions, the more intuitive simplification becomes. Keep exploring different types of problems to strengthen your mathematical foundation!

Frequently Asked Questions

What is the fully simplified form of $2ab(8a)$?

The fully simplified form is $\frac{4b}{1}$, which simplifies to $4b$.

How do you simplify the expression $2ab(8a)$?

Multiply the coefficients 2 and 8 to get 16, and multiply the variables: $a \cdot a = a^2$. So, the expression becomes $16a^2b$.

Is the simplified form of $2ab(8a)$ equal to $\frac{4}{b}$?

No, the simplified form is $16a^2b$, which is not equal to $\frac{4}{b}$.

Which option represents the correct simplified form of $2ab(8a)$?

The correct option is B) $\frac{4}{b}$, if simplified incorrectly, but the actual simplified form is $16a^2b$.

Why is the answer not option A) $\frac{2ab}{8a}$?

Because $\frac{2ab}{8a}$ simplifies to $\frac{ab}{4}$, which is not equivalent to $2ab(8a)$.

What is the step-by-step simplification process for $2ab(8a)$?

First, multiply the coefficients: $2 \cdot 8 = 16$. Then, multiply the variables: $a \cdot a = a^2$. The variable b remains as is. So, the simplified form is $16a^2b$.

Can $2ab(8a)$ be simplified to a form involving division by b ?

No, because the multiplication results in $16a^2b$; dividing it would not simplify the expression meaningfully.

What is the importance of identifying the correct simplified form in algebra?

Simplifying expressions helps in solving equations efficiently and understanding the relationships between variables clearly.

Additional Resources

The fully simplified form of $2ab(8a)$ is a fundamental concept in algebra that helps students and mathematicians alike understand how to manipulate expressions to their most reduced forms. Simplifying expressions not only makes calculations easier but also reveals the underlying

relationships between variables. In this article, we will explore the process step-by-step to determine the fully simplified form of the expression $2ab(8a)$, analyze the provided options, and understand the reasoning behind the correct answer.

Understanding the Expression: $2ab(8a)$

Before diving into the simplification process, it's crucial to understand what the expression represents:

- $2ab(8a)$ is a product of two factors: $2ab$ and $8a$.
- The variables involved are a and b .
- The coefficients are 2 and 8.

The goal is to simplify this expression to its most reduced form, often called the fully simplified form, where no further reduction is possible, and the expression is as concise as possible.

Step-by-Step Breakdown of Simplification

Let's analyze the expression:

Expression: $2ab(8a)$

Step 1: Recognize that this is a product of two expressions

- When two expressions are multiplied, you multiply their coefficients and variables separately.

Step 2: Rewrite the expression to clarify

- The expression can be viewed as:

$$(2ab) \times (8a)$$

- To simplify, multiply the coefficients and then the variables.

Step 3: Multiply the coefficients

- $2 \times 8 = 16$

Step 4: Multiply the variables

- For variables with the same base, you add exponents:

- $a \times a = a^2$

- b remains as is

- So, the variables multiply as:

$$a \times a = a^2$$

The variable b stays as is

Step 5: Write the combined expression

- Combining all parts:

$$16 \times a^2 \times b$$

- Or simply: $16a^2b$

Conclusion: The fully simplified form of $2ab(8a)$ is $16a^2b$.

Analysis of the Given Options

The problem provides three options for the simplified form:

- A) $\frac{2ab}{8a}$
- B) $\frac{4}{b}$
- C) $\frac{b}{4}$

Let's examine each to determine which correctly represents the simplified form.

Option A: $\frac{2ab}{8a}$

- This expression looks like the division of two algebraic terms, not a product.
- If we interpret the original problem as dividing $2ab$ by $8a$, then:
 - Simplify numerator: $2ab$
 - Simplify denominator: $8a$
 - Simplify numerator and denominator:
 - Coefficients: $2 / 8 = 1 / 4$

- Variables: $a / a = 1$

- b remains as is

- Result: $\frac{1}{4}b$ or $\frac{b}{4}$

- Note: This is different from the original expression $2ab(8a)$, which is a product, not a division.

Conclusion: Unless the problem is asking for the division of $2ab$ by $8a$, Option A doesn't represent the simplified form of the product $2ab(8a)$. It seems to be a different expression.

Option B: $\frac{4}{b}$

- This expression suggests the simplified form is inversely proportional to b , with a numerator of 4.

- From our previous calculation, the fully simplified form of $2ab(8a)$ is $16a^2b$, which does not match $\frac{4}{b}$.

- Therefore, Option B is not equivalent to the original expression's simplified form.

Option C: $\frac{b}{4}$

- This is a simple fraction involving b .

- Comparing to our simplified form $16a^2b$, this does not match.

- So, Option C is also not the correct simplified form of the original expression.

Summary of the Simplification and Correct Choice

- The key step was recognizing that $2ab(8a)$ is a product, which simplifies as:

1. Multiply coefficients: $2 \times 8 = 16$

2. Multiply variables:

- $a \times a = a^2$

- b remains unchanged

3. Final simplified expression: $16a^2b$

- None of the provided options directly match $16a^2b$. However, if we revisit Option A:

$\left(\frac{2ab}{8a}\right)$ simplifies to:

- Coefficients: $2 / 8 = 1/4$

- Variables: $a / a = 1$

- b stays as b

- Result: $\left(\frac{b}{4}\right)$

- This matches Option C, $\left(\frac{b}{4}\right)$, only if the original expression was a division, but the problem states $2ab(8a)$, which indicates multiplication.

Possible Interpretation:

- If the problem intends to ask for the simplified form of the division $\left(\frac{2ab}{8a}\right)$, then the answer is $\left(\frac{b}{4}\right)$ (Option C).

- If the problem is about the product $2ab(8a)$, then the correct simplified form is $16a^2b$, which is not listed among the options.

Conclusion and Final Clarification

- Based on the initial expression $2ab(8a)$, the fully simplified form is $16a^2b$.

- If the question is asking about the simplified form of $\left(\frac{2ab}{8a}\right)$, then the correct answer is Option C: $\left(\frac{b}{4}\right)$.

- Therefore, the most accurate choice based on the options provided and typical interpretation is Option C: $\left(\frac{b}{4}\right)$.

Key Takeaways for Simplifying Algebraic Expressions

1. Identify the operation: Determine whether the expression involves multiplication or division.

2. Multiply coefficients: Always multiply the numerical parts together.

3. Combine like variables: When variables with the same base are multiplied, add exponents.

4. Divide coefficients and variables: When dividing, divide coefficients and subtract exponents of like bases.

5. Simplify completely: Reduce fractions and expressions to their simplest form.

Final Thoughts

Understanding how to simplify algebraic expressions is essential for mastering higher-level mathematics. Whether dealing with products or quotients, breaking down the expression into manageable parts helps ensure accurate results. Remember to consider the context of the problem—are you multiplying or dividing? Clarifying this leads to the correct simplified form. In this case, based on given options and standard interpretation, the best answer is Option C: $\frac{b}{4}$, acknowledging that the original expression and options might reflect different operations.

In summary, the fully simplified form of the expression involving $2ab(8a)$ depends on the operation—product or division—but understanding the step-by-step process ensures you can confidently approach similar algebraic simplifications in any mathematical context.

The Fully Simplified Form Of $2ab(8a)$ Is A $\frac{2ab(8a)}{b}$ $\frac{4}{b}$ C $\frac{b}{4}$

The Fully Simplified Form Of $2ab(8a)$ Is A $\frac{2ab(8a)}{b}$ $\frac{4}{b}$ C $\frac{b}{4}$

Related Articles

- [Substance A Undergoes A First Order Reaction A B With A Half-life Of 20 Min At 25 C. If The Initial Concentration](#)
- [Why Would You Want To Take An Advanced Placement Course?"" Brooklyn's Cousin Asks Her. ""They're Way Harder."](#)
- [What Is The Likely Effect Of Bigger Container Ships On The Bullwhip Effect In The Global Supply Chains?\(Remember,](#)

[Back to Home](#)