

Given $a = -4$, $b = -4$ And $c = -5$ work Out $b - 2ac$

Given $a = -4$, $b = -4$ And $c = -5$ work Out $b - 2ac$

Understanding how to work out algebraic expressions involving variables is a fundamental skill in mathematics, especially in algebra. In this article, we will explore how to evaluate the expression $b - 2ac$ given specific values for the variables a , b , and c . The provided values are $a = -4$, $b = -4$, and $c = -5$.

This problem not only involves substitution but also requires understanding the order of operations and the properties of negative numbers. Whether you are a student preparing for exams or someone interested in improving your algebra skills, this detailed guide will help you master the process of evaluating such expressions efficiently and accurately.

Understanding the Given Values and the Expression

Before diving into the calculations, it's essential to understand what the problem entails.

Given Values:

- $a = -4$
- $b = -4$
- $c = -5$

Expression to Evaluate:

- $b - 2ac$

This expression involves multiple operations: multiplication, subtraction, and the combination of variables. Our goal is to substitute the given values into the expression and simplify step-by-step to find the final result.

Step-by-Step Breakdown of the Calculation

To evaluate $b - 2ac$, follow these systematic steps:

Step 1: Substitute the known values into the expression

- Replace a, b, and c with their given numerical values:

$$b - 2ac = (-4) - 2(-4)(-5)$$

Step 2: Simplify the multiplication part (2 a c)

- Focus on calculating 2 a c:
 - First, multiply 2 by a:
 - $2(-4) = -8$
 - Then, multiply the result by c:
 - $-8(-5) = 40$
- Note: Multiplying two negative numbers yields a positive result.

Step 3: Complete the expression by subtracting from b

- Now, substitute the result back into the expression:

$$b - 2ac = -4 - 40$$

- Simplify:
 - $-4 - 40 = -44$

Final Result:

$$b - 2ac = -44$$

Understanding the Rules and Properties Used

To fully grasp how the calculation was performed, it's important to understand some fundamental algebra rules and properties:

1. Substitution of Variables

- Replacing variables with their numerical values is the first step in evaluating algebraic expressions.

2. Order of Operations (PEMDAS/BODMAS)

- Parentheses
- Exponents
- Multiplication and Division (from left to right)
- Addition and Subtraction (from left to right)

In this case, multiplication is performed before subtraction.

3. Multiplying Negative Numbers

- Negative $\times$ Negative = Positive
- Negative $\times$ Positive = Negative

Understanding these properties ensures accurate calculations involving negative values.

4. Simplification of Expressions

- Combining like terms and performing calculations step by step reduces errors and clarifies the process.

Practical Applications of Evaluating Algebraic Expressions

Evaluating algebraic expressions such as $b - 2ac$ has real-world applications across various fields:

1. Engineering and Physics

- Calculating forces, velocities, or other quantities where variables represent physical parameters.

2. Economics

- Modeling profit, cost, or revenue functions dependent on multiple variables.

3. Computer Science

- Algorithm design often involves substituting values into formulas to simulate scenarios.

4. Everyday Problem-Solving

- Budgeting, planning, and decision-making often require evaluating expressions based on changing variables.

Common Mistakes to Avoid

When working with algebraic expressions, certain pitfalls can lead to errors:

1. Forgetting to substitute values correctly

- Always double-check substitutions to prevent mistakes.

2. Ignoring the order of operations

- Performing multiplication before addition or subtraction is crucial.

3. Mishandling negative numbers

- Be cautious with signs, especially when multiplying or dividing negatives.

4. Overlooking parentheses

- Parentheses dictate the calculation order; neglecting them can change the result.

Summary and Final Thoughts

Evaluating the expression $b - 2ac$ with the given values $a = -4$, $b = -4$, and $c = -5$ involves straightforward substitution and careful application of algebraic rules. The key steps include:

- Substituting the known values into the expression.
- Simplifying the multiplication of negative numbers correctly.
- Following the order of operations to ensure accurate calculation.

The step-by-step process reveals that:

$$b - 2ac = -44$$

This example highlights the importance of understanding negative number properties and the order of operations, which are fundamental skills in algebra and mathematics as a whole.

Additional Practice Problems

To reinforce your understanding, try solving similar problems:

1. Given $a = 3$, $b = -2$, $c = 4$, evaluate $b - 2ac$
2. If $a = -1$, $b = 5$, $c = -3$, find $b - 2ac$
3. With $a = 0$, $b = -7$, $c = 2$, compute $b - 2ac$

Practicing these will enhance your confidence and proficiency in algebraic evaluations.

Conclusion

Mastering the evaluation of algebraic expressions like $b - 2ac$ is essential for advanced mathematics and practical problem-solving. By understanding how to substitute values, apply the order of operations, and handle negative numbers, you can confidently approach similar problems. Remember, practice makes perfect—regularly working through such exercises will improve your skills and deepen your understanding of algebraic concepts.

Frequently Asked Questions

Given $a = -4$, $b = -4$, and $c = -5$, what is the value of $b - 2ac$?

First, calculate $2ac$: $2(-4)(-5) = 2(20) = 40$. Then, $b - 2ac = -4 - 40 = -44$.

How do you evaluate the expression $b - 2ac$ with $a = -4$, $b = -4$, and $c = -5$?

Substitute the values into the expression: $b - 2ac = -4 - 2(-4)(-5)$. Calculate $2(-4)(-5) = 40$. So, the expression becomes $-4 - 40 = -44$.

What is the result of $b - 2ac$ when $a = -4$, $b = -4$, and $c = -5$?

The result is -44 .

If $a = -4$, $b = -4$, and $c = -5$, what does the expression $b - 2ac$ evaluate to?

It evaluates to -44 .

Calculate $b - 2ac$ with the given values $a = -4$, $b = -4$, $c = -5$.

Calculate $2ac$: $2(-4)(-5) = 40$. Then, $b - 2ac = -4 - 40 = -44$.

Additional Resources

Mathematical Exploration: Calculating $(b - 2ac)$ Given $(a = -4)$, $(b = -4)$, and $(c = -5)$

Introduction

Mathematics often appears as an abstract discipline, but its principles underpin countless real-world applications—from engineering to economics, from computer science to physics. Among the foundational skills in mathematics is the ability to manipulate algebraic expressions and evaluate formulas based on given variables. Today, we delve into a specific algebraic problem, which invites us to compute the expression $(b - 2ac)$ given three variables:

- $a = -4$
- $b = -4$
- $c = -5$

This problem, while seemingly straightforward, offers a rich opportunity to explore algebraic substitution, sign rules, and the importance of precise calculations. Whether you are a student honing your algebra skills or an enthusiast interested in mathematical problem-solving, understanding this calculation in depth can reinforce core concepts.

Understanding the Variables and Expression

Before diving into the calculation, it's essential to understand what each component represents:

- Variables (a, b, c) : These are placeholders for numerical values. In many contexts, they could represent coefficients, measurements, or parameters within a broader equation or system.
- Expression $(b - 2ac)$: This is a linear algebraic expression involving multiplication and subtraction. Its evaluation depends entirely on the specific values substituted for (a, b) and (c) .

In our scenario, the variables are assigned negative values:

- $a = -4$
- $b = -4$
- $c = -5$

Step-by-Step Calculation Process

Let's now carefully analyze how to compute $(b - 2ac)$ with these values.

Step 1: Recognize the order of operations

Mathematical expressions follow the order of operations, often remembered by the acronym PEMDAS:

- Parentheses
- Exponents
- Multiplication and Division (from left to right)
- Addition and Subtraction (from left to right)

In the expression $(b - 2ac)$, the multiplication $(2ac)$ must be evaluated first, then subtracted from (b) .

Step 2: Calculate $(2ac)$

- $(a = -4)$
- $(c = -5)$
- The coefficient (2) is a positive scalar.

Compute:

```
\[
2 \times a \times c = 2 \times (-4) \times (-5)
\]
```

Step-by-step:

- $(2 \times (-4) = -8)$
- $(-8 \times (-5) = 40)$

This step is crucial because multiplying two negative numbers yields a positive result. The negative signs cancel out, resulting in (40) .

Step 3: Substitute into the original expression

Now, the expression becomes:

```
\[
b - 2ac = -4 - 40
\]
```

Since $(b = -4)$ and $(2ac = 40)$, the calculation simplifies to:

```
\[
-4 - 40
\]
```

Step 4: Final addition/subtraction

Subtracting (40) from (-4) :

```
\[
-4 - 40 = -44
\]
```

Thus, the value of the expression $(b - 2ac)$ given the specified variables is (-44) .

Detailed Explanation of Sign Rules and Multiplication

Understanding why the multiplication step resulted in a positive 40 is key:

- Negative $\times$ Negative = Positive: When multiplying two negative numbers, the negatives cancel out, resulting in a positive product. In this case, $(-4 \times -5 = 20)$.

- Scaling by 2: The coefficient (2) is positive, so it scales the product without changing its sign:

```
\[
```

2 \times 20 = 40
\]

This is an important concept because it often trips up students who are new to algebra: the signs play a crucial role in determining the outcome.

Broader Context and Applications

While this calculation is straightforward, it connects to many broader mathematical concepts and real-world applications.

1. Algebraic Manipulation Skills

Mastering such calculations reinforces fundamental skills like substitution, order of operations, and sign rules, which are essential across all levels of mathematics.

2. Problem Solving in Physics

Variables like (a, b, c) often represent parameters such as acceleration, force, or coefficients in physical equations. Evaluating expressions quickly and accurately can be critical in modeling physical systems.

3. Financial Modeling

In finance, similar calculations occur when evaluating expressions involving interest rates, coefficients, and adjustments—sometimes involving negative values to represent losses or debts.

Common Mistakes to Avoid

When performing such calculations, a few common errors can occur:

- Misapplying sign rules: Confusing the product of two negatives with a positive.
- Incorrect order of operations: Forgetting to evaluate multiplication before subtraction.
- Misreading variables: Substituting the wrong values or mixing up signs.

Ensuring clarity at each step and double-checking calculations can help avoid these pitfalls.

Summary of the Calculation

Step	Operation	Result	Explanation
1	Calculate $(2 \times a \times c)$	$(2 \times (-4) \times (-5))$	Multiply sequentially
2	Simplify $(2 \times (-4))$	(-8)	Multiply first two
3	Multiply $(-8 \times (-5))$	(40)	Negative times negative yields positive
4	Substitute into $(b - 2ac)$	$(-4 - 40)$	Replacing $(2ac)$ with (40)

| 5 | Final calculation | (-44) | Subtract (40) from (-4) |

Final Remarks

The calculation of $(b - 2ac)$ with $(a = -4)$, $(b = -4)$, and $(c = -5)$ exemplifies the elegance and precision of algebra. Despite the simplicity of the numbers involved, the problem encapsulates core mathematical principles—sign rules, order of operations, and substitution—that are foundational to more complex problem-solving.

Understanding such problems deeply enhances one's ability to approach diverse quantitative challenges confidently. Whether used in academic contexts or practical applications, mastering these basic techniques paves the way for advanced mathematical comprehension and analytical skills.

In conclusion, the value of $(b - 2ac)$ under the given conditions is (-44) . This result underscores the importance of careful calculation, awareness of sign rules, and systematic problem-solving—a trio of skills that serve as the backbone of mathematical literacy.

[Givena 4 B 4 And C 5work Outb 2ac](#)

Givena 4 B 4 And C 5work Outb 2ac

Related Articles

- [Summarize Articles 4-6 Of The Constitution](#)
- [Example Answers For Qu Hizo Tu Amigo Esta Maana?](#)
- [What Do The Lusitania And The Sussex Have In Common?](#)

[Back to Home](#)