

Which Equation Has The Correct Sign On The Product?0 A. $(-12)^4 = 48$ B. $(-9)(-9) = -81$ 0 C. $31(-10) = -310$ 0

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When evaluating mathematical equations involving multiplication, understanding the correct signs on the products is crucial. Many students and learners often find themselves confused about how negative numbers behave during multiplication and which equations are accurate representations of these operations. In this article, we will analyze the given equations to determine which one correctly displays the sign on the product, providing clear explanations and fundamental rules of multiplication involving positive and negative numbers.

Understanding the Basics of Multiplication Signs

Before diving into the specific equations, it's essential to review the basic rules governing multiplication signs:

Signs of the Multiplication of Numbers

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

These rules are fundamental in determining whether the product of two numbers will be positive or negative.

Applying the Rules to the Equations

Understanding these rules helps evaluate whether the equations presented are correct in terms of their signs:

- The first equation involves multiplying a negative number by 4.
- The second involves multiplying two negative numbers.
- The third involves multiplying a positive number by a negative number.

Now, let's analyze each equation in detail.

Analyzing Equation A: $(-12)4 = 48$

This equation appears to be written as " $(-12)4$," which likely indicates multiplication, but the notation might be ambiguous. Assuming it means multiplication, the correct expression should be " $(-12) \times 4$."

Step-by-Step Evaluation of Equation A

1. Identify the numbers: -12 and 4 .
2. Apply the sign rules: Negative times positive results in a negative product.
3. Calculate the magnitude: $12 \times 4 = 48$.
4. Apply the sign: Negative times positive = Negative, so the product should be -48 .
5. Compare with the given result: 48 .

Conclusion: The product of -12 and 4 is -48 , not 48 . Therefore, Equation A is incorrect in its sign on the product.

Analyzing Equation B: $(-9)(-9) = -81$

This equation involves multiplying two negative numbers.

Step-by-Step Evaluation of Equation B

1. Numbers involved: -9 and -9 .
2. Sign rule: Negative $\times$ Negative = Positive.

3. Calculate the magnitude: $9 \times 9 = 81$.
4. Apply the sign: Because both numbers are negative, the product is positive 81.
5. Compare with the given result: -81 .

Conclusion: The correct product of -9 and -9 is $+81$, not -81 . Hence, Equation B incorrectly states the sign of the product.

Analyzing Equation C: $31(-10) = -310$

This equation involves multiplying a positive number by a negative number.

Step-by-Step Evaluation of Equation C

1. Numbers involved: 31 and -10 .
2. Sign rule: Positive $\times$ Negative = Negative.
3. Calculate the magnitude: $31 \times 10 = 310$.
4. Apply the sign: The product is negative because one number is negative.
5. Compare with the given result: -310 .

Conclusion: The calculation and sign are correct; 31 multiplied by -10 is indeed -310 . Therefore, Equation C correctly displays the sign on the product.

Summary and Final Verdict

Based on the analysis above, the only equation that correctly shows the sign on the product is Equation C:

- Equation A is incorrect because the product of -12 and 4 should be -48 , not 48.
- Equation B is incorrect because the product of -9 and -9 should be $+81$, not -81 .

- Equation C is correct because 31 multiplied by -10 results in -310 , correctly reflecting the sign.

Why Understanding Sign Rules Is Important

Mastering the rules of multiplying positive and negative numbers is essential for various areas of mathematics, including algebra, calculus, and real-world problem-solving. Misinterpreting signs can lead to significant errors, especially in complex calculations.

Practical Tips for Remembering Sign Rules

- Think of the signs as "positive" and "negative" attitudes; multiplying negatives gives a positive "attitude."
- Use the "sign chart" to visualize outcomes:

Multiplier 1	Multiplier 2	Product Sign
Positive	Positive	Positive
Positive	Negative	Negative
Negative	Positive	Negative
Negative	Negative	Positive

The Importance of Correct Sign Usage in Mathematics

Correctly understanding and applying sign rules ensures accurate calculations, which is vital for students, professionals, and anyone working with numbers. Whether solving algebraic equations or performing real-world calculations, recognizing the correct sign on products prevents errors and promotes mathematical literacy.

Final Thoughts

In conclusion, among the given equations, Equation C: $31(-10) = -310$ is the only one correctly displaying the sign on the product. The other equations incorrectly represent the signs based on basic multiplication rules involving positive and negative numbers.

Remember: Always recall the fundamental rules:

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

Mastering these rules will help you quickly determine the correctness of equations involving signs, ensuring accuracy in your mathematical endeavors.

Keywords for SEO Optimization:

- Correct sign on product
- Multiplication signs rules
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- Math equations sign accuracy
- Understanding signs in multiplication
- Sign errors in equations

Frequently Asked Questions

Which equation correctly shows the sign on the product: $(-12) 4$?

The correct equation is $(-12) 4 = -48$, so the sign is negative.

Does the equation $(-9)(-9) = -81$ have the correct sign?

No, the product of two negative numbers is positive, so the correct answer is 81.

Is the equation $31 (-10) = -310$ accurate in terms of

sign?

Yes, multiplying a positive number by a negative number results in a negative product, so -310 is correct.

Which of the equations correctly indicates the sign of the product?

Equation C ($31 - 10 = -310$) has the correct sign, as the product is negative.

Why is $(-9)(-9) = 81$ instead of -81 ?

Because multiplying two negative numbers results in a positive product.

Is the sign in $(-12) 4 = 48$ correct?

No, because $(-12) 4$ actually equals -48 , not 48 .

What is the correct sign for the product of (-12) and 4 ?

The product should be negative, so $(-12) 4 = -48$.

In the context of multiplication, when do we get a negative product?

When multiplying a positive number by a negative number or vice versa.

Is the equation $(-9)(-9) = -81$ correct?

No, because the product of two negatives is positive, so it should be 81 .

Which of the provided equations has the correct sign on the product?

Equation C, $31 - 10 = -310$, has the correct sign.

Additional Resources

Mathematics: Deciphering the Correct Sign on the Product

Introduction

Mathematics often appears as a realm of precision, clarity, and consistency,

yet it also brims with common misconceptions that can challenge even seasoned enthusiasts. One such area is understanding the correct signs on products—particularly when dealing with negative numbers and multiplication. The question at hand—"Which equation has the correct sign on the product?"—not only tests basic arithmetic skills but also emphasizes comprehension of fundamental rules governing signs in multiplication.

This article aims to unpack each of the given options, analyze their correctness, and deepen your understanding of how signs behave during multiplication. Whether you're a student, educator, or math enthusiast, this detailed exploration offers insights into the logic behind sign rules, common errors, and practical tips to master this core aspect of arithmetic.

The Sign Rules in Multiplication: A Primer

Before diving into the specific options, it's essential to understand the foundational rules that govern signs in multiplication:

1. Multiplying two positive numbers:

- Rule: The product is positive.
- Example: $4 \times 3 = 12$

2. Multiplying a positive and a negative number:

- Rule: The product is negative.
- Example: $4 \times (-3) = -12$

3. Multiplying two negative numbers:

- Rule: The product is positive.
- Example: $(-4) \times (-3) = 12$

4. Sign of the product depends on the parity of the number of negative factors:

- If one negative factor exists, the product is negative.
- If two negatives exist, they cancel out, resulting in a positive.

Understanding these rules is key to evaluating the correctness of the given options.

Analyzing the Given Options

Let's now examine each of the options provided:

- A. $(-12)4 = 48$
- B. $(-9)(-9) = -81$
- C. $31(-10) = -310$

Each statement will be broken down carefully.

Option A: $(-12)4 = 48$

Step 1: Interpreting the Expression

The notation $(-12)4$ is typically understood as (-12) multiplied by 4. That is:

$\backslash (-12) \times 4 \backslash$

Step 2: Applying Sign Rules

- Negative number: -12
- Positive number: 4

According to the rules:

$\backslash (-12) \times 4 = - (12 \times 4) = -48 \backslash$

Because multiplying a negative by a positive yields a negative, the product should be -48.

Step 3: Comparing with the Given Result

The statement claims the product is 48—a positive number.

Conclusion:

The sign is incorrect. The correct product should be -48, not 48.

Option B: $(-9)(-9) = -81$

Step 1: Interpreting the Expression

This is:

$\backslash (-9) \times (-9) \backslash$

Step 2: Applying Sign Rules

- Both factors are negative.
- Multiplying two negatives results in a positive:

$\backslash (-9) \times (-9) = + (9 \times 9) = +81 \backslash$

Step 3: Comparing with the Given Result

The statement gives -81, which is negative.

Conclusion:
The sign is incorrect. The actual product should be +81.

Option C: $31(-10) = -310$

Step 1: Interpreting the Expression

This is:

$[31 \times (-10)]$

Step 2: Applying Sign Rules

- Positive times negative yields negative:

$[31 \times (-10) = - (31 \times 10) = -310]$

Step 3: Comparing with the Given Result

The statement claims -310, which aligns with the correct sign.

Conclusion:
This expression is correct in both magnitude and sign.

Summary of Correctness

Option	Expression	Correct Sign?	Explanation
A	$(-12)4 = 48$	No	Correct product is -48, but the statement claims +48.
B	$(-9)(-9) = -81$	No	Correct product is +81, but the statement claims -81.
C	$31(-10) = -310$	Yes	Correct in both magnitude and sign.

Deep Dive: Why do These Sign Errors Matter?

Understanding the proper signs in multiplication isn't just academic; it has practical implications ranging from financial calculations to engineering and computer science. Misinterpreting signs can lead to significant errors, sometimes catastrophic in real-world applications.

Common pitfalls include:

- Forgetting that negative $\times$ negative = positive.
- Confusing the placement of signs, especially with multiple negatives.

- Forgetting to consider the sign rules when dealing with expressions involving parentheses.

By mastering these rules, one can confidently evaluate complex expressions, avoid errors, and develop a more intuitive grasp of arithmetic operations.

Additional Tips for Mastery

- Visualize with Number Line: Think of negative and positive numbers on a number line to understand how signs interact.
- Use Visual Aids: Drawing multiplication tables or sign charts can help.
- Practice with Variations: Experiment with different combinations of positive and negative numbers.
- Remember the 'Parity of Negatives': One negative yields a negative product; two negatives cancel to positive.

Final Verdict: Which Equation Has the Correct Sign?

Based on the thorough analysis:

- Option A is incorrect; the product should be -48, not 48.
- Option B is incorrect; the product should be +81, not -81.
- Option C is correct; the product $31 \times (-10) = -310$.

Therefore, the only equation with the correct sign on the product is Option C.

Conclusion

Understanding the signs in multiplication is a fundamental skill that underpins much of mathematics. Whether you're verifying calculations, solving equations, or just aiming to strengthen your arithmetic intuition, grasping these core principles is essential.

In the context of the original question, the correct and accurate expression is:

> C. $31(-10) = -310$

By internalizing the sign rules and practicing regularly, you'll find that evaluating such expressions becomes second nature, transforming potential confusion into confidence.

Remember: In mathematics, the correctness of an answer isn't just about the magnitude but also about the sign—precision in both counts!

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