

What Is $-79.2 / (-16.5)$? Show Your Work

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Understanding how to divide negative numbers can sometimes be confusing, especially when dealing with real-world applications or academic problems. In this article, we will explore the question What is -79.2 divided by -16.5 ?, demonstrate detailed steps to solve it, and discuss related concepts to help you grasp the topic thoroughly.

Introduction to Division of Negative Numbers

Division involving negative numbers is a fundamental concept in mathematics. It often appears in various contexts, including finance, engineering, and everyday problem-solving. When dividing two numbers, the key is to understand how signs affect the result.

Basic rules to remember:

- Positive $\div$ Positive = Positive
- Negative $\div$ Negative = Positive
- Positive $\div$ Negative = Negative
- Negative $\div$ Positive = Negative

In our specific problem, both the numerator (-79.2) and the denominator (-16.5) are negative, so the result will be positive, based on the rules above.

Step-by-Step Solution to $-79.2 \div -16.5$

Let's walk through the process to compute -79.2 divided by -16.5 .

Step 1: Simplify the signs

As both numbers are negative, their division yields a positive result:

$$\begin{aligned} & \backslash [\\ & -79.2 \backslash \text{div} -16.5 = 79.2 \backslash \text{div} 16.5 \\ & \backslash] \end{aligned}$$

Now, the problem reduces to dividing two positive numbers: 79.2 and 16.5.

Step 2: Set up the division

Express the division as a fraction or a long division problem:

```
\[
\frac{79.2}{16.5}
\]
```

Step 3: Remove decimals by converting to whole numbers

Dividing decimal numbers directly can be easier if we eliminate the decimals. To do this, multiply numerator and denominator by the same power of 10 to convert both to integers.

- 79.2 has one decimal place → multiply by 10
- 16.5 has one decimal place → multiply by 10

Multiplying numerator and denominator by 10:

```
\[
\frac{79.2 \times 10}{16.5 \times 10} = \frac{792}{165}
\]
```

Now, the division simplifies to:

```
\[
792 \div 165
\]
```

Step 4: Simplify the fraction (if possible)

Check if numerator and denominator have common factors:

- 792 and 165 are both divisible by 3.

Divide numerator and denominator by 3:

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\[
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$$\frac{792 \div 3}{165 \div 3} = \frac{264}{55}$$

Now, the fraction is $\frac{264}{55}$.

Check if further simplification is possible:

- 264 and 55 share a common factor of 11, since:

$$264 \div 11 = 24, \quad 55 \div 11 = 5$$

Thus, the fraction reduces further to:

$$\frac{24}{5}$$

Step 5: Convert the fraction to a decimal

Divide 24 by 5:

$$24 \div 5 = 4.8$$

Therefore,

$$\frac{24}{5} = 4.8$$

Final Answer: 4.8

Since both original numbers were negative, the division's result is positive:

$$\boxed{-79.2 \div -16.5 = 4.8}$$

Additional Concepts and Related Topics

Understanding this division problem opens doors to various related mathematical concepts. Below, we discuss some of these ideas to deepen your comprehension.

Sign Rules in Division and Multiplication

The signs of numbers in division and multiplication follow specific rules:

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

This consistency helps predict the sign of the answer without performing the calculation.

Dealing with Decimals and Fractions

- Converting decimals to fractions simplifies the division process, especially when the numbers are complex.
- Always multiply numerator and denominator by powers of 10 to clear decimal points for easier calculation.
- Simplify fractions by dividing numerator and denominator by their greatest common divisor (GCD).

Calculating Precise Results and Approximations

- Use long division or a calculator for precise results.
- If an approximate value suffices, round the answer to desired decimal places.
- For example, 4.8 is an exact result from our calculation, but if you need an approximation, you might express it as 4.8 or rounded to 4.8.

Applications of Division with Negative Numbers

- Financial calculations: determining profit/loss ratios.
- Physics: calculating velocities, accelerations, or other quantities with directionality.
- Engineering: analyzing forces and stresses with positive and negative values.

Common Mistakes to Avoid

When solving division problems involving negatives, be cautious of the following:

- Ignoring sign rules, leading to incorrect signs in the result.
- Performing division with decimals without clearing them first, which can cause calculation errors.
- Forgetting to simplify fractions to their lowest terms for clarity and accuracy.
- Using approximate methods prematurely; verify with precise calculations when necessary.

Summary

In this comprehensive guide, we've tackled the question What is -79.2 divided by -16.5 ? by:

- Clarifying the rules for dividing negative numbers.
- Simplifying decimals by converting to whole numbers.
- Reducing the resulting fraction to its simplest form.
- Converting the simplified fraction to a decimal answer.

The final result is 4.8 , a positive number, consistent with the rule that dividing two negatives yields a positive.

Additional Resources for Learning Division

- Online calculators: Useful for verifying answers and practicing division problems.
- Math workbooks: Provide exercises on dividing negative numbers.
- Educational videos: Visual explanations of sign rules and decimal conversions.

- Math apps: Interactive tools for practicing fractions, decimals, and division.

Conclusion

Understanding how to divide negative numbers like in $-79.2 \div -16.5$ is essential for mastering algebra and higher mathematics. By breaking down the problem into manageable steps—handling signs, converting decimals, simplifying fractions, and performing division—you can confidently solve similar problems with accuracy. Remember these rules and techniques to improve your mathematical skills and apply them effectively in various contexts.

Meta Description:

Learn how to solve -79.2 divided by -16.5 step-by-step. Discover the rules for dividing negative numbers, simplify decimals, and understand the complete process with detailed explanations.

Frequently Asked Questions

What is the value of -79.2 divided by -16.5 ?

The value of -79.2 divided by -16.5 is approximately 4.8.

How do you compute -79.2 divided by -16.5 step by step?

First, ignore the signs and divide 79.2 by 16.5, which gives approximately 4.8. Since both numbers are negative, the result is positive. Therefore, $-79.2 / -16.5 = 4.8$.

Why is the result of dividing two negative numbers positive?

Dividing two negative numbers results in a positive because of the rules of signs in arithmetic: a negative divided by a negative equals a positive.

Can you show the actual division calculation for

-79.2 / -16.5?

Yes. Divide 79.2 by 16.5: $79.200 \div 16.5 \approx 4.8$. Since both original numbers are negative, the quotient is positive, so the final answer is 4.8.

Is there a calculator method to find -79.2 / -16.5?

Yes. Enter $-79.2 \div -16.5$ into a calculator, which will automatically give the answer as 4.8, since dividing two negatives yields a positive result.

What does the division -79.2 / -16.5 tell us in real-world context?

It can represent, for example, a positive rate or ratio, such as profit per unit, indicating that dividing two negative values results in a positive quantity.

How does understanding the division of negatives help in real-life math problems?

Knowing that dividing two negatives yields a positive helps correctly interpret and solve problems involving debts, temperature changes, or other scenarios where negatives are involved.

What is the approximate decimal value of -79.2 / -16.5?

The approximate decimal value is 4.8.

Can the result of -79.2 / -16.5 be expressed as a fraction?

Yes, the division can be expressed as $79.2 / 16.5$, which simplifies to a fraction that is equivalent to $48/10$ or $24/5$ after simplification, and the division results in the decimal 4.8.

Additional Resources

What Is $-79.2 / (-16.5)$? Show Your Work: A Comprehensive Breakdown and Step-by-Step Guide

When tackling division problems involving negative numbers, such as $-79.2 / (-16.5)$, it's essential to understand both the basic principles of division and how the signs of the numbers influence the result. In this article, we will explore what $-79.2 / (-16.5)$ means, demonstrate the step-by-step process to solve it, and clarify common misconceptions along the way. Whether you're

a student learning about negative division or someone looking to sharpen your math skills, this detailed guide will walk you through the entire process.

Understanding the Expression: What Does $-79.2 / (-16.5)$ Mean?

Before diving into calculations, let's interpret the problem:

- -79.2 is a negative number, which could represent a deficit, a decrease, or a value below zero.
- -16.5 is also negative, perhaps indicating an opposing or counteracting quantity.
- The division $-79.2 / (-16.5)$ asks: How many times does -16.5 fit into -79.2 ?

Because both numbers are negative, the division will result in a positive number. This is rooted in the rule that dividing two numbers with the same sign yields a positive result.

Key Point:

Dividing two negative numbers results in a positive quotient.

Step-by-Step Breakdown: How to Calculate $-79.2 / (-16.5)$

Let's now move through the process methodically.

Step 1: Recognize the Sign Rules

- Negative divided by negative = positive
- Negative divided by positive = negative
- Positive divided by negative = negative
- Positive divided by positive = positive

Since both numbers are negative, the answer will be positive.

Step 2: Convert the Division to a Simpler Form

Because dealing with decimals can sometimes be cumbersome, it's often easier to work with whole numbers by eliminating decimals through multiplication.

Method:

Multiply numerator and denominator by a power of 10 to eliminate decimals.

- For -79.2 , multiply by 10 $\rightarrow -792$

- For -16.5, multiply by 10 → -165

Thus:

$$\left[\frac{-79.2}{-16.5} = \frac{-792}{-165} \right]$$

Remember, multiplying both numerator and denominator by the same number does not change the value of the quotient.

Step 3: Simplify the Fraction

Now, the problem reduces to dividing -792 by -165.

Since both numbers are negative, the quotient will be positive, so:

$$\left[\frac{792}{165} \right]$$

Next, simplify the fraction to its lowest terms.

Step 4: Find the Greatest Common Divisor (GCD)

To simplify, find the GCD of 792 and 165.

Method to find GCD:

- List prime factors of 792:
- $792 \div 2 = 396$
- $396 \div 2 = 198$
- $198 \div 2 = 99$
- $99 \div 3 = 33$
- $33 \div 3 = 11$
- 11 is prime

So, prime factors of 792:

$$2 \times 2 \times 2 \times 3 \times 3 \times 11$$

- List prime factors of 165:
- $165 \div 3 = 55$
- $55 \div 5 = 11$
- 11 is prime

Prime factors of 165:

$$3 \times 5 \times 11$$

Identify common factors:
Both share 3 and 11.

GCD:
 $3 \times 11 = 33$

Step 5: Divide Numerator and Denominator by GCD

Divide both numerator and denominator by 33:

$$\left[\frac{792 \div 33}{165 \div 33} = \frac{24}{5} \right]$$

So, the simplified form of the fraction is $24/5$.

Step 6: Convert to a Mixed Number or Decimal

- As an improper fraction, $24/5$.
- To express as a decimal:

$$\left[24 \div 5 = 4.8 \right]$$

Since both original numbers were negative, the final answer is positive:

$$\left[\boxed{4.8} \right]$$

Final Answer: $-79.2 / -16.5 = 4.8$

Additional Insights: Why Does Dividing Negative Numbers Yield a Positive Result?

Understanding the rules of signs in division is crucial:

- Same signs (both negative or both positive): The quotient is positive.
- Different signs: The quotient is negative.

This rule stems from the properties of real numbers and is consistent with the rules for multiplication.

Common Mistakes to Avoid

- Ignoring the signs: Forgetting that dividing two negatives results in a positive can lead to incorrect answers.
- Not simplifying fractions: Always simplify to lowest terms for clarity.
- Mixing decimal and fractional forms without proper conversion: Convert decimals to fractions or vice versa before calculations.
- Assuming the division of negatives yields a negative: It's a common misconception. Remember, negatives cancel out in division, resulting in a positive quotient when both are negative.

Summary: How to Approach Similar Problems

Here's a practical checklist for solving division problems involving negatives and decimals:

1. Identify the signs of both numbers.
2. Determine the sign of the result based on the rules.
3. Eliminate decimals by multiplying numerator and denominator by the appropriate power of 10.
4. Simplify the resulting fraction by finding the GCD.
5. Convert the simplified fraction to decimal or mixed number as required.
6. Apply the sign to the final answer.

Final Thoughts

Dividing $-79.2 / -16.5$ demonstrates core principles of arithmetic involving negatives and decimals. By following a structured approach—recognizing signs, simplifying fractions, and converting to decimals—you can confidently handle similar problems. Remember, the key takeaway here is that dividing two negative numbers always results in a positive quotient, and proper decimal handling simplifies the process.

Understanding these fundamentals not only helps in solving specific problems but also builds a solid foundation for tackling more complex algebraic and real-world math challenges.

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