

Simplify The Following Expression. $3 \frac{11}{5}$ Go In To $\frac{3}{-9/5}$

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Introduction

Understanding how to simplify complex algebraic expressions is an essential skill for students and professionals alike. Whether you're working on a math homework, preparing for an exam, or tackling real-world problems involving fractions and mixed numbers, mastering the process of simplifying expressions is crucial.

Today, we will explore the specific problem: **Simplify The Following Expression. $3 \frac{11}{5}$ Go In To $\frac{3}{-9/5}$** . This problem involves converting a mixed number into an improper fraction and then performing division between two fractions. By carefully analyzing each step, you will learn how to simplify similar expressions efficiently and accurately.

Understanding the Components of the Expression

Before diving into the simplification process, let's clarify what the expression entails:

- Mixed Number: $3 \frac{11}{5}$
- Fraction to Divide By: $\frac{3}{-9/5}$

At first glance, this might seem straightforward, but there are nuances involved in handling mixed numbers, negative fractions, and division operations.

Step 1: Converting the Mixed Number to an Improper Fraction

What is a Mixed Number?

A mixed number combines a whole number with a fraction, such as $3 \frac{11}{5}$. To work with fractions algebraically, it's often easier to convert mixed numbers into improper fractions.

Converting $3 \frac{11}{5}$ to an Improper Fraction

Here's a step-by-step guide:

1. Multiply the whole number by the denominator of the fractional part:

$$- 3 \times 5 = 15$$

2. Add the numerator of the fractional part:

$$- 15 + 11 = 26$$

3. Place the sum over the original denominator:

$$- \frac{26}{5}$$

Result:

$$3 \frac{11}{5} = \frac{26}{5}$$

This conversion allows us to work with a single fraction rather than a mixed number, simplifying subsequent calculations.

Step 2: Understanding the Division Expression

The division operation is expressed as:

$$\left[\frac{26}{5} \div \frac{3}{-\frac{9}{5}} \right]$$

Note: The second fraction appears to be 3 divided by $-9/5$, but based on standard notation, it might be better interpreted as:

$$\left[\frac{26}{5} \div \frac{-9}{5} \right]$$

or

$$\left[\frac{26}{5} \div \left(\frac{3}{-\frac{9}{5}} \right) \right]$$

However, given the problem statement, it seems the intended expression is:

$$\left[\frac{26}{5} \div \frac{-9}{5} \right]$$

To clarify, the expression "3/-9/5" is interpreted as:

- 3 divided by $(-9/5)$

which simplifies to:

$$\frac{3}{-\frac{9}{5}}$$

Let's analyze both possibilities.

Scenario 1: The expression is:

$$\frac{26}{5} \div \frac{-9}{5}$$

Scenario 2: The expression involves dividing 3 by $-\frac{9}{5}$, then working with $11/5$, but since the problem explicitly states "3 $11/5$," it's most consistent to interpret the full expression as:

$$\left(3 + \frac{11}{5} \right) \div \left(\frac{3}{- \frac{9}{5}} \right)$$

which simplifies to:

$$\frac{26}{5} \div \left(3 \div \frac{-9}{5} \right)$$

Given the ambiguity, let's focus on the most plausible interpretation: the expression is to convert "3 $11/5$ " into an improper fraction and divide it by " $3/-9/5$ ", which is 3 divided by $-9/5$.

Final assumption:

The expression is:

$$\frac{26}{5} \div \left(\frac{3}{1} - \frac{9}{5} \right)$$

Note: For clarity, let's proceed with this interpretation.

Step 3: Simplify the Divisor: 3 divided by $-9/5$

To simplify:

$$3 \div \left(-\frac{9}{5} \right)$$

Recall that dividing by a fraction is equivalent to multiplying by its reciprocal:

$$3 \times \left(-\frac{5}{9} \right) = -\frac{15}{9}$$

Simplify:

$$-\frac{15}{9} = -\frac{5}{3}$$

Result:

The divisor simplifies to $(-\frac{5}{3})$.

Summary so far:

- The numerator (mixed number $3 \frac{11}{5}$) converted to improper fraction: $(\frac{26}{5})$
- The divisor (3 divided by $-\frac{9}{5}$) simplifies to: $(-\frac{5}{3})$

Now, the original division simplifies to:

$$\left[\frac{26}{5} \div \left(-\frac{5}{3} \right) \right]$$

Step 4: Dividing Fractions

Dividing two fractions involves multiplying the first fraction by the reciprocal of the second:

$$\left[\frac{26}{5} \div \left(-\frac{5}{3} \right) = \frac{26}{5} \times \left(-\frac{3}{5} \right) \right]$$

Perform the multiplication:

$$\left[\frac{26 \times (-3)}{5 \times 5} = \frac{-78}{25} \right]$$

\]

Final simplified result:

\[

\boxed{\frac{-78}{25}}

\]

This is an improper fraction, but it can be expressed as a mixed number or decimal if needed.

Optional: Converting to a Mixed Number or Decimal

- Mixed Number:

Divide numerator by denominator:

$78 \div 25 = 3$ with a remainder of 3

Since the numerator is negative:

\[

$-78/25 = -(3 + \frac{3}{25}) = -3 \frac{3}{25}$

\]

- Decimal:

Divide 78 by 25:

$$78 \div 25 = 3.12$$

Apply the negative sign:

$$(-3.12)$$

Summary of the Simplification Process

1. Converted the mixed number $3 \frac{11}{5}$ into an improper fraction: $\frac{26}{5}$
2. Interpreted and simplified the divisor:

- Calculated $3 \div \frac{9}{5}$ to get $\frac{5}{3}$

3. Performed the division of fractions:

$$\frac{26}{5} \div \frac{5}{3} = \frac{26}{5} \times \frac{3}{5} = \frac{78}{25}$$

4. Expressed the answer as a mixed number: $-3 \frac{3}{25}$

Additional Tips for Simplifying Complex Fractions and Mixed Numbers

- Always convert mixed numbers to improper fractions for easier calculations.
- When dividing fractions, remember to multiply by the reciprocal.
- Simplify fractions at each step to keep numbers manageable.

- Be mindful of negative signs; they can appear in numerator, denominator, or both.
- Converting improper fractions back to mixed numbers can make the answer more understandable.

Common Mistakes to Avoid

- Misinterpreting the expression: Clarify whether the division involves the mixed number or just parts of it.
- Forgetting to convert mixed numbers: Always convert to improper fractions before operations.
- Incorrect reciprocal usage: Remember that dividing by a fraction is multiplying by its reciprocal.
- Ignoring signs: Negative signs can change the entire value; handle them carefully.

Conclusion

Simplifying the expression " $3 \frac{11}{5}$ go in to $3 \frac{-9}{5}$ " involves multiple steps, including converting mixed numbers to improper fractions, simplifying division of fractions, and handling negative signs properly. By following a systematic approach:

- Convert mixed numbers to improper fractions.
- Simplify division expressions by multiplying by reciprocals.
- Simplify fractions at each step to reduce errors.
- Express the final answer in the most understandable form, whether as an improper fraction, mixed number, or decimal.

Mastering these steps enhances your mathematical skills and prepares you for more complex

algebraic and fractional problems.

Final Answer:

$$\boxed{-\frac{78}{25} \quad \text{or} \quad -3\frac{3}{25} \quad \text{or approximately} \quad -3.12}$$

Frequently Asked Questions

How do I simplify the expression $3\frac{11}{5}$ divided by $3 - \frac{9}{5}$?

First, convert $3\frac{11}{5}$ to an improper fraction: $3\frac{11}{5} = (3 \times 5 + 11)/5 = 26/5$. Then, rewrite the division as a multiplication by the reciprocal: $(26/5) \div (3 - 9/5)$. Simplify the denominator: $3 - 9/5 = (15/5) - (9/5) = 6/5$. Now, divide: $(26/5) \div (6/5) = (26/5) \times (5/6) = (26 \times 5)/(5 \times 6) = 26/6 = 13/3$. So, the simplified result is $13/3$.

What is the step-by-step process to simplify $3\frac{11}{5}$ divided by $3 - \frac{9}{5}$?

Step 1: Convert $3\frac{11}{5}$ to an improper fraction: $26/5$. Step 2: Calculate the denominator: $3 - 9/5 = (15/5) - (9/5) = 6/5$. Step 3: Rewrite the division as multiplication by the reciprocal: $(26/5) \div (6/5) = (26/5) \times (5/6)$. Step 4: Simplify: $(26 \times 5)/(5 \times 6) = 130/30$. Step 5: Reduce the fraction: $130/30 = 13/3$. The simplified answer is $13/3$.

Can I simplify the expression without converting to improper fractions?

It's easier to convert mixed numbers and complex expressions to improper fractions first, as it

simplifies the process of division and subtraction. Attempting to simplify directly without conversion may lead to errors. Therefore, converting to improper fractions is recommended for clarity and accuracy.

What common mistakes should I avoid when simplifying this expression?

Avoid forgetting to convert mixed numbers to improper fractions, mixing up subtraction and division operations, and not simplifying fractions before multiplying or dividing. Also, ensure you perform the subtraction in the denominator correctly before dividing.

How can I verify my simplified answer for this type of expression?

You can verify by substituting your simplified result back into the original expression or by using a calculator to perform the original operations step-by-step. If both approaches match, your simplification is correct.

Additional Resources

Simplify the Following Expression: $3\frac{11}{5}$ Going Into $\frac{3}{-9/5}$

Understanding and simplifying complex algebraic expressions can sometimes feel daunting, especially when fractions and mixed numbers intertwine. Today, we'll explore a specific example: " $3\frac{11}{5}$ going into $\frac{3}{-9/5}$ ". This phrase, though initially cryptic, involves fundamental principles of algebra and fractions, making it an excellent candidate for a detailed walkthrough.

Through this article, we aim to break down each step of the simplification process, analyze the components involved, and clarify how to handle mixed numbers and complex fractions with confidence—much like an expert reviewing a sophisticated product or tool.

Decoding the Expression: What Does It Really Say?

Before diving into calculations, it's crucial to understand what the expression entails. The phrase "3 11/5 going into 3/-9/5" can be interpreted in mathematical terms as:

- A mixed number: $3 \frac{11}{5}$
- A fractional expression or ratio: $3 / (-9/5)$

The phrase "going into" suggests a division operation, where the first component (the mixed number) is divided by the second component (the complex fraction).

Rephrased mathematically:

$$\frac{3 \frac{11}{5}}{\frac{3}{-\frac{9}{5}}}$$

This interpretation aligns with common mathematical language, where "going into" is often used colloquially to denote division.

Breaking Down the Components

To simplify this expression, we need to address each part carefully:

2.1 Mixed Number: $3 \frac{11}{5}$

Mixed numbers combine whole numbers and fractions. To facilitate calculations, convert this to an

improper fraction:

$$\begin{aligned} & \left[\right. \\ & 3 \frac{11}{5} = \frac{(3 \times 5 + 11)}{5} = \frac{(15 + 11)}{5} = \frac{26}{5} \\ & \left. \right] \end{aligned}$$

Key Point: Converting mixed numbers to improper fractions simplifies the process, allowing us to perform algebraic operations more straightforwardly.

2.2 Complex Fraction: $3 \div (-9/5)$

The denominator itself is a fraction, which indicates division by a fraction. Let's analyze:

$$\begin{aligned} & \left[\right. \\ & \frac{3}{-\frac{9}{5}} \\ & \left. \right] \end{aligned}$$

Dividing a number by a fraction is equivalent to multiplying by its reciprocal:

$$\begin{aligned} & \left[\right. \\ & \frac{3}{-\frac{9}{5}} = 3 \times \left(-\frac{5}{9}\right) = -\frac{15}{9} \\ & \left. \right] \end{aligned}$$

Simplify numerator and denominator:

$$\begin{aligned} & \left[\right. \\ & -\frac{15}{9} = -\frac{5}{3} \\ & \left. \right] \end{aligned}$$

Key Point: Dividing by a negative fraction yields a negative result, and simplifying fractions after multiplication makes the expression cleaner.

Constructing the Complete Expression

Now that we have:

$$\frac{\text{Numerator (mixed number)}}{\text{Denominator (complex fraction)}} = \frac{26/5}{-\frac{5}{3}}$$

Our entire expression becomes:

$$\frac{26/5}{-5/3}$$

Step-by-Step Simplification Process

Let's proceed with simplifying the entire expression systematically.

3.1 Division of Fractions

Dividing one fraction by another involves multiplying the first by the reciprocal of the second:

$$\frac{26}{5} \times \frac{3}{-5}$$

3.2 Multiply the Fractions

Multiply numerators and denominators:

$$(26 \times 3) / (5 \times -5) = 78 / -25$$

Expressed as a simplified fraction:

$$-\frac{78}{25}$$

3.3 Final Simplification

Check if the numerator and denominator have common factors:

- 78 factors: 2, 3, 13

- 25 factors: 5, 5

Since 78 and 25 share no common factors, the fraction is already in simplest form.

Result:

$$\boxed{-\frac{78}{25}}$$

\]

This is the simplified form of the original expression.

Expressing the Result as a Mixed Number (Optional)

For clarity or specific applications, converting the improper fraction back into a mixed number can be helpful.

Divide 78 by 25:

- 25 goes into 78 three times (75), with a remainder of 3.

Expressed as:

\[

3 \frac{3}{25}

\]

Since the original fraction was negative, the mixed number retains the negative sign:

\[

-\left(3 \frac{3}{25}\right)

\]

Summary of the Simplification Process

Here's a quick recap of the steps involved:

1. Convert mixed number to improper fraction:

$$- \left(3 \frac{11}{5} \right) = \frac{26}{5}$$

2. Simplify the complex fraction in the denominator:

$$- \left(\frac{3}{-\frac{9}{5}} \right) = 3 \times -\frac{5}{9} = -\frac{15}{9} = -\frac{5}{3}$$

3. Divide the two fractions:

$$- \left(\frac{26/5}{-5/3} \right) = \frac{26}{5} \times \frac{3}{-5} = \frac{26 \times 3}{5 \times -5} = \frac{78}{-25}$$

4. Simplify the result:

$$- \left(-\frac{78}{25} \right)$$

5. Optional: Convert to mixed number:

$$- \left(-3 \frac{3}{25} \right)$$

Key Takeaways and Tips for Similar Problems

- Always convert mixed numbers to improper fractions for easier manipulation.
- Handle complex fractions carefully by multiplying numerator by the reciprocal of the denominator.
- Simplify before multiplying or dividing to keep fractions manageable.
- Check for common factors to reduce fractions to simplest terms.
- Maintain attention to signs; dividing by negative fractions switches the sign of the result.

Final Thoughts: Why This Matters

Mastering the simplification of complex expressions like $3\frac{11}{5}$ going into $3\frac{-9}{5}$ enhances your algebraic fluency and prepares you for more advanced topics such as algebraic equations, ratios, and real-world problem solving. It exemplifies how fundamental operations—conversion, multiplication, division, and simplification—intertwine seamlessly in mathematical reasoning.

Whether you're a student striving for clarity or a professional reviewing intricate calculations, understanding each step ensures accuracy and confidence. Remember, breaking down complex expressions into manageable parts is the key to unlocking their underlying simplicity.

In conclusion, the simplified form of $3\frac{11}{5}$ going into $3\frac{-9}{5}$ is $-\frac{78}{25}$ or, as a mixed number, $-3\frac{3}{25}$. This process underscores the importance of converting mixed numbers, handling complex fractions, and careful multiplication/division—tools essential for any mathematician or numerically inclined professional.

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