Chi Needs To Simplify The Expression Below.(1.25 Minus 0.4) Divided By 7 + 4 Times 3Which Operation Should

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Understanding how to simplify complex mathematical expressions is a fundamental skill in mathematics that applies to various fields, from basic arithmetic to advanced algebra and calculus. When faced with expressions like "(1.25 minus 0.4) divided by 7 plus 4 times 3," it becomes essential to follow a systematic approach to determine the correct operation to perform first and simplify the expression accurately. This article aims to guide you through the process of simplifying such expressions step-by-step, emphasizing the importance of understanding the order of operations.

Understanding the Expression

Before diving into the solution, let's carefully analyze the given expression:

(1.25 minus 0.4) divided by 7 + 4 times 3

At first glance, the expression includes several operations: subtraction, division, addition, and multiplication. To simplify it correctly, we need to understand the order in which these operations should be performed.

Breaking Down the Expression

The expression can be written as:

$(1.25 - 0.4) \div 7 + 4 \times 3$

which involves the following components:

- Subtraction: 1.25 - 0.4
- Division: The result of the subtraction divided by 7
- Multiplication: 4 times 3
- Addition: Combining the division result and the multiplication result

Order of Operations (PEMDAS/BODMAS)

The key to simplifying any complex expression is understanding the order of operations, often summarized by the acronym PEMDAS or BODMAS:

- P/B: Parentheses/Brackets
- E/O: Exponents/Orders (powers and roots)
- MD: Multiplication and Division (from left to right)
- AS: Addition and Subtraction (from left to right)

Applying this rule ensures that everyone simplifies expressions consistently and correctly.

Prioritizing Operations in Our Expression

In our specific expression:

(1.25 - 0.4) ÷ 7 + 4 × 3

the steps are:

1. Simplify inside parentheses: 1.25 - 0.4
2. Perform the division: (result from step 1) ÷ 7
3. Calculate the multiplication: 4 × 3
4. Add the results from steps 2 and 3

Let's analyze each step in detail.

Step-by-Step Simplification Process

Step 1: Simplify Inside Parentheses

Calculate 1.25 - 0.4:

- 1.25 - 0.4 = 0.85

Step 2: Perform Division

Divide the result from step 1 by 7:

- 0.85 ÷ 7 ≈ 0.1214 (rounded to four decimal places)

Step 3: Perform Multiplication

Calculate 4 × 3:

- 4 × 3 = 12

Step 4: Final Addition

Add the results from steps 2 and 3:

- 0.1214 + 12 ≈ 12.1214

Therefore, the simplified value of the entire expression is approximately 12.1214.

Which Operation Should Chi Perform First?

Based on the order of operations, Chi should perform the following:

1. Parentheses first: Simplify 1.25 - 0.4
2. Division next: Divide the result by 7
3. Multiplication: Calculate 4 × 3
4. Addition last: Add the division result and the multiplication result

This order ensures an accurate and systematic simplification process.

Common Mistakes to Avoid

While simplifying expressions, it's easy to make mistakes if the order of operations isn't followed carefully. Here are some common errors and tips to avoid them:

1. Ignoring Parentheses

- Always evaluate expressions inside parentheses or brackets first.
- Example mistake: Adding 7 + 4 before dividing or subtracting.

2. Performing Multiplication and Division in the Wrong Order

- Remember that multiplication and division are of equal priority; perform them from left to right.
- Example mistake: Dividing before subtracting the parentheses content.

3. Misinterpreting the Expression

- Ensure the expression is correctly parsed: parentheses, multiplication, division, addition.
- Break complex expressions into smaller parts for clarity.

Practice Problems to Reinforce Learning

To solidify understanding, try simplifying the following expressions:

1. (2 + 3) × 4 - 5
2. 10 ÷ (2 + 3)
3. (8 - 3) × 2 + 4
4. 6 + 4 × (2 - 1)
5. (3 + 5) ÷ 2 + 7

Answers:

1. (2 + 3) × 4 - 5 = 5 × 4 - 5 = 20 - 5 = 15
2. 10 ÷ (2 + 3) = 10 ÷ 5 = 2
3. (8 - 3) × 2 + 4 = 5 × 2 + 4 = 10 + 4 = 14
4. 6 + 4 × (2 - 1) = 6 + 4 × 1 = 6 + 4 = 10
5. (3 + 5) ÷ 2 + 7 = 8 ÷ 2 + 7 = 4 + 7 = 11

Conclusion: The Key to Simplifying Expressions

Chi's task of simplifying the expression emphasizes the importance of following the order of operations meticulously. Always start with parentheses, then move to exponents (if any), followed by multiplication and division from left to right, and finally addition and subtraction from left to right. Mastering this process not only leads to correct solutions but also builds a strong foundation for tackling more complex mathematical problems. Remember, systematic approach and careful attention to the order of operations are the keys to success in mathematics.

Frequently Asked Questions

What is the first step to simplify the expression (1.25 - 0.4) ÷ 7 + 4 × 3?

First, perform the subtraction inside the parentheses: 1.25 - 0.4.

How do you handle the division and multiplication in the expression after simplifying the parentheses?

Apply the order of operations, performing division and multiplication from left to right.

What is the result of (1.25 - 0.4)?

The result is 0.85.

Once you have 0.85 ÷ 7, what is the next step?

Calculate 0.85 divided by 7 to simplify that part of the expression.

What is 0.85 divided by 7?

0.85 ÷ 7 equals approximately 0.1214.

How do you evaluate the 4 × 3 part of the expression?

Multiply 4 by 3 to get 12.

After calculating all parts, how do you combine them to find the final result?

Add the result of 0.85 ÷ 7 (approximately 0.1214) to 12 to get the final answer.

What is the final simplified value of the expression?

The final result is approximately 12.1214.

Which operation should be performed first in the expression: subtraction, division, or multiplication?

Perform the subtraction inside the parentheses first, then division and multiplication follow according to the order of operations.

Additional Resources

Chi Needs To Simplify The Expression Below.(1.25 Minus 0.4) Divided By 7 + 4 Times 3Which Operation Should

In the realm of mathematics, simplifying expressions is a fundamental skill that fosters clarity and precision in problem-solving. Recently, Chi encountered an intriguing numerical puzzle: "Chi Needs To Simplify The Expression Below.(1.25 Minus 0.4) Divided By 7 + 4 Times 3Which Operation Should". At first glance, the statement may seem straightforward, but it opens the door to exploring the intricacies of order of operations, parentheses, and arithmetic hierarchy. This article aims to break down this expression systematically, guiding readers through the thought process involved in simplifying such expressions while emphasizing the importance of choosing the correct sequence of operations.

Understanding the Expression: Breaking It Down

The expression in question appears to be a mix of numbers, operations, and a phrase prompting the reader to determine which operation should take precedence. To analyze it effectively, we must interpret it carefully.

Original Statement:

> Chi Needs To Simplify The Expression Below.(1.25 Minus 0.4) Divided By 7 + 4 Times 3Which Operation Should

Interpreted Mathematical Form:

- The phrase suggests the expression:
$$(1.25 - 0.4) \div 7 + 4 \times 3$$

- The phrase "Which Operation Should" indicates a focus on understanding the correct order of operations.

Key Points to Clarify:

- The parentheses around (1.25 - 0.4) imply this subtraction should be performed first.
- The division and multiplication are outside the parentheses, so their order depends on the rules of precedence.
- The overall goal is to simplify this expression correctly, considering the hierarchy of operations.

The Importance of Order of Operations

Before delving into the step-by-step calculation, it is crucial to revisit the concept of the order of operations, often remembered by the mnemonic PEMDAS (Parentheses, Exponents, Multiplication and Division, Addition and Subtraction).

PEMDAS Breakdown:

- Parentheses (P): Simplify expressions inside parentheses first.
- Exponents (E): Calculate powers and roots next.
- Multiplication and Division (MD): Perform these operations from left to right.
- Addition and Subtraction (AS): Finally, perform these from left to right.

Why Is This Important?

Misapplying the order can lead to incorrect results. For example, in the expression:

$$ 3 + 4 \times 2 $$

- Correct approach:

Multiply first: $4 \times 2 = 8$, then add: $3 + 8 = 11$.

- Incorrect approach:
Adding first: $3 + 4 = 7$, then multiplying: $7 \times 2 = 14$, which is wrong according to standard precedence.

Applying PEMDAS to Our Expression:

Given our expression:

$$(1.25 - 0.4) \div 7 + 4 \times 3$$

- Parentheses: $(1.25 - 0.4)$
- Division: $\div 7$
- Multiplication: 4×3
- Addition: sum of the division result and the product

Step-by-Step Simplification of the Expression

Let's methodically simplify the expression to arrive at the correct answer.

Step 1: Simplify Inside Parentheses

Calculate:

$$1.25 - 0.4$$

- Subtract 0.4 from 1.25:

$$1.25 - 0.4 = 0.85$$

Step 2: Division

Next, divide the result by 7:

$$0.85 \div 7$$

- Performing this division:

$$0.85 \div 7 \approx 0.1214$$ (rounded to four decimal places)

Step 3: Calculate the Multiplication

Now, compute:

$$4 \times 3 = 12$$

Step 4: Final Addition

Add the results from Step 2 and Step 3:

$$ 0.1214 + 12 \approx 12.1214 $$

Understanding Which Operation to Perform First

The core question posed is "Which operation should" be performed first? Based on the order of operations:

- Parentheses are evaluated first.
- Division and multiplication are performed next, from left to right.
- Addition and subtraction come last.

In this expression:

- The parentheses dictate that $1.25 - 0.4$ should be calculated first.
- Next, division of the parentheses result by 7 is performed.
- Simultaneously, the multiplication 4×3 is computed.
- Finally, the sum of the division result and the product is calculated.

Therefore, the sequence of operations is:

1. Parentheses subtraction.
2. Division.
3. Multiplication.
4. Addition.

Common Pitfalls and How to Avoid Them

While the steps seem straightforward, many students and even seasoned mathematicians can fall into common traps when simplifying expressions. Recognizing these pitfalls is essential for accurate calculations.

Pitfall 1: Ignoring Parentheses

Mistake: Performing division and multiplication before subtracting inside parentheses.

Solution: Always evaluate parentheses first; they take precedence regardless of the other operations.

Pitfall 2: Improper Order of Multiplication and Division

Mistake: Performing multiplication before division or vice versa without following the left-to-right rule.

Solution: Remember that multiplication and division have equal precedence; perform them in order from left to right.

Pitfall 3: Misinterpretation of the Expression

Mistake: Assuming the phrase "which operation should" indicates a choice rather than following the order of operations.

Solution: Recognize that the phrase is guiding you to determine the correct sequence based on mathematical rules, not choosing between operations arbitrarily.

Practical Applications and Broader Significance

Understanding how to simplify expressions correctly isn't merely an academic exercise; it has real-world applications across various fields:

- Engineering and Physics: Precise calculations are vital for designing systems, calculating forces, or analyzing data.
- Computer Programming: Accurate expression evaluation ensures algorithms produce correct results.
- Financial Calculations: Correctly applying operation hierarchy prevents costly errors in computations like interest calculations or budgeting.
- Educational Development: Mastery of order of operations fosters critical thinking and problem-solving skills.

Furthermore, clarity in mathematical expressions enhances communication within scientific and technical communities, ensuring everyone interprets data consistently.

Conclusion: The Path to Correct Simplification

The journey of simplifying the expression:

$$(1.25 - 0.4) \div 7 + 4 \times 3$$

demonstrates the importance of adhering to the established hierarchy of operations. By carefully following the steps—evaluating parentheses first, then division and multiplication, and finally addition—Chi can arrive at the correct simplified result of approximately 12.1214.

This process underscores a key lesson: in mathematics, the order in which operations are performed

is not arbitrary but governed by well-defined rules that ensure consistency and accuracy. Recognizing these rules and applying them diligently allows us not only to solve individual problems but also to develop a deeper understanding of the mathematical language that underpins many aspects of our world.

In essence, the question "Which operation should" is answered by remembering PEMDAS: perform parentheses first, then exponents, followed by multiplication and division from left to right, and finally addition and subtraction. With this knowledge, Chi is well-equipped to tackle similar expressions confidently and correctly in the future.

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