Let X = (4-7) And Y = (4+7), Then Value Of (x-y/3) + (xy+xy)+(x+y) Is -

Let X = (4-7) And Y = (4+7), Then Value Of (x-y/3) + (xy+xy)+(x+y) Is -

Understanding how to evaluate algebraic expressions based on given values of variables is fundamental in mathematics. In this discussion, we will explore the expression involving variables X and Y, interpret their assigned values, and compute the overall result. This process not only reinforces basic algebraic skills but also demonstrates the importance of careful substitution and order of operations in solving complex expressions.

Introduction to the Problem

The problem begins with defining two variables:

- $X = (4 - 7)$
- $Y = (4 + 7)$

Following these definitions, the goal is to evaluate the expression:

$$
\left(\frac{x - y}{3} \right) + (xy + xy) + (x + y)
$$

and determine its value.

This type of problem is typical in algebra, requiring the following steps:

1. Find the numerical values of X and Y.
2. Substitute these values into the expression.
3. Simplify step-by-step, respecting the order of operations (PEMDAS/BODMAS).
4. Interpret the final answer.

Calculating the Values of X and Y

Step 1: Evaluate $X = (4 - 7)$

- $4 - 7 = -3$
- Therefore, $X = -3$

Step 2: Evaluate $Y = (4 + 7)$

- $4 + 7 = 11$
- Therefore, $Y = 11$

Now, with these values, the expression becomes:

$$
\left(\frac{-3 - 11}{3} \right) + (-3 \times 11 + -3 \times 11) + (-3 + 11)
$$

Substituting Values into the Expression

The original expression, with the known values, is:

$$
\left(\frac{x - y}{3} \right) + (xy + xy) + (x + y)
$$

becomes

$$
\left(\frac{-3 - 11}{3} \right) + (-3 \times 11 + -3 \times 11) + (-3 + 11)
$$

Notice that in the expression, the variables x and y are placeholders, but since we have assigned $X = -3$ and $Y = 11$, we will use $x = -3$, $y = 11$.

Step-by-Step Simplification

Step 1: Simplify $\frac{x - y}{3}$

- $x - y = -3 - 11 = -14$
- Therefore, $\frac{-14}{3}$

This remains as a fraction for now: $\boxed{-\frac{14}{3}}$.

Step 2: Simplify $(xy + xy)$

- First, find xy:

$$
xy = -3 \times 11 = -33
$$

- Since the expression is $xy + xy$:

$$
-33 + (-33) = -66
$$

Step 3: Simplify $(x + y)$

- $x + y = -3 + 11 = 8$

Now, combining all parts, the entire expression becomes:

$$
-\frac{14}{3} + (-66) + 8
$$

Final Calculation and Result

Combine the numerical parts

- Convert all terms to a common denominator to combine the fractions and integers:

$$
-\frac{14}{3} + (-66) + 8
$$

- Express -66 and 8 as fractions with denominator 3:

$$
-\frac{14}{3} + \left(-\frac{66 \times 3}{3} \right) + \frac{8 \times 3}{3}
$$

\]

- Calculate numerator equivalents:

- \(-66 \times 3 = -198\)
- \(8 \times 3 = 24\)

- So, the expression is:

\[
-\frac{14}{3} - \frac{198}{3} + \frac{24}{3}
\]

- Combine the numerators:

\[
\frac{-14 - 198 + 24}{3} = \frac{-188}{3}
\]

Conclusion

The value of the entire expression simplifies to:

\[
\boxed{-\frac{188}{3}}
\]

which is approximately \(-62.666...\).

Understanding the Significance of the Result

The negative result indicates that, given the initial values and the structure of the expression, the overall value tilts toward the negative side. It highlights the importance of careful substitution and the order of operations in algebra.

Key points to remember:

- Always evaluate the assigned values for variables before substitution.
- Simplify expressions step-by-step, respecting parentheses.
- Convert mixed expressions to common denominators for easier addition/subtraction.
- Negative results are common in algebra, especially when subtracting larger numbers from smaller ones.

Practical Applications of Similar Algebraic Evaluations

Understanding how to evaluate such expressions has numerous real-world applications:

1. **Financial Calculations:** Calculating net gains or losses based on cost and revenue variables.
2. **Engineering:** Analyzing forces, voltages, or other parameters where variables are defined with specific values.
3. **Physics:** Computing quantities like energy, velocity, or acceleration based on given parameters.
4. **Computer Science:** Programming algorithms that involve variable substitution and expression evaluation.

Summary

To summarize, evaluating the expression:

$$
\left(\frac{x - y}{3} \right) + (xy + xy) + (x + y)
$$

with $X = -3$ and $Y = 11$, results in a final value of:

$$
-\frac{188}{3}
$$

which approximates to -62.67.

This process underscores the importance of systematic evaluation, understanding algebraic operations, and careful substitution. Mastery of these skills enables students and professionals alike to solve complex problems efficiently and accurately.

Final Thoughts

Algebra remains a foundational pillar in mathematics, with applications spanning numerous fields. By practicing problems like this, learners develop critical thinking, problem-solving skills, and a deeper understanding of variable manipulation. Always approach such problems methodically, verify each step, and ensure clarity in calculations for accurate results.

Keywords: algebra, variable substitution, algebraic expression, evaluation, mathematical calculation, step-by-step solution, simplifying expressions, negative numbers, fractions, algebraic expressions with variables

Frequently Asked Questions

Given X = (4 - 7) and Y = (4 + 7), what is the value of X?

X = 4 - 7 = -3

Given X = (4 - 7) and Y = (4 + 7), what is the value of Y?

Y = 4 + 7 = 11

What is the value of (X - Y) / 3 when X = -3 and Y = 11?

(X - Y) / 3 = (-3 - 11) / 3 = (-14) / 3 = -14/3

What is the value of XY when X = -3 and Y = 11?

XY = -3 11 = -33

What is the value of XY + XY when X = -3 and Y = 11?

XY + XY = -33 + (-33) = -66

What is the sum of X and Y when X = -3 and Y = 11?

X + Y = -3 + 11 = 8

Calculate the overall value of the expression: [(X - Y)/3] + (XY + XY) + (X + Y).

(-14/3) + (-66) + 8 = -14/3 - 66 + 8

What is the simplified form of the expression: (-14/3) - 66 + 8?

Convert to common denominator: (-14/3) - (66 3/3) + (8 3/3) = -14/3 - 198/3 + 24/3 = (-14 - 198 + 24)/3 = (-188)/3

What is the final value of the expression after simplification?

The value is -188/3.

Express the final answer as a decimal.

-188/3 ≈ -62.6667

Additional Resources

Mathematical Exploration: Deciphering the Expression with Given Variables

In the realm of algebra and mathematical problem solving, clarity and precision are paramount. The problem statement, "Let X = (4-7) and Y = (4+7), then value of (x - y/3) + (xy + xy) + (x + y) is -," presents an intriguing challenge that demands careful analysis and meticulous calculation. This article aims to delve into each component of the problem, interpret the variables and expressions correctly, and provide a comprehensive understanding of the solution process. Through step-by-step explanations, contextual insights, and critical evaluation, we will uncover the meaning behind the question and elucidate the pathway to its resolution.

Understanding the Variables: X and Y

Defining X and Y

The problem begins by assigning specific numeric values to the variables X and Y:

- X = (4 - 7)

- Y = (4 + 7)

At first glance, these assignments seem straightforward. However, interpreting what these mean in the context of algebraic expressions is essential.

Calculations:

- X = 4 - 7 = -3
- Y = 4 + 7 = 11

This step confirms the numerical values of X and Y, which will serve as the basis for subsequent calculations. Recognizing that these are simple arithmetic operations helps avoid ambiguities that might arise from more complex interpretations.

Implications of the Variable Assignments

Knowing the explicit values:
- X = -3
- Y = 11

allows us to substitute directly into the expression, simplifying the problem significantly. This approach paves the way for a straightforward calculation process, ensuring accuracy and clarity.

Deciphering the Expression to be Evaluated

The core of the problem is to compute the value of the following expression:

(x - y/3) + (xy + xy) + (x + y)

Given the earlier definitions, it’s crucial to understand each component's structure and how to interpret it correctly.

Breaking Down the Expression

1. (x - y/3):
This term involves subtracting one-third of y from x.

2. (xy + xy):
The sum of two identical products of x and y, which simplifies algebraically.

3. (x + y):

The sum of x and y.

Note on Notation:

- The variables x and y are lowercase, but the assignments are uppercase, X and Y.
- Conventionally, in algebra, case sensitivity can be ignored unless specified, so we assume x = X and y = Y.

Step-by-Step Calculation Process

1. Substituting Known Values

Using the determined values:

- x = -3
- y = 11

we proceed to evaluate each part separately.

2. Evaluating Each Component

a) Calculating (x - y/3):

- y/3 = 11/3 ≈ 3.6667
- x - y/3 = -3 - (11/3) = -3 - 3.6667 ≈ -6.6667

b) Calculating (xy + xy):

- xy = (-3) 11 = -33
- xy + xy = -33 + (-33) = -66

c) Calculating (x + y):

- x + y = -3 + 11 = 8

Consolidating the Results

Now, summing all parts:

- (x - y/3) ≈ -6.6667
- (xy + xy) = -66
- (x + y) = 8

Total:

-6.6667 + (-66) + 8 = (-6.6667 - 66) + 8 = -72.6667 + 8 = -64.6667

Final Answer:

$$
\boxed{
\text{Value} \approx -64.6667
}
$$

Expressed as a fraction:

$-6\frac{2}{3} + 8 = \frac{-20}{3} + \frac{24}{3} = \frac{4}{3}$

But since the sum of the decimal values is approximately -64.6667, the exact fractional sum is:

- $\frac{-196}{3}$

Note: The previous step's fractional calculation indicates a need for precise fractional addition.

Let's verify the fractional calculation precisely:

- (x - y/3) = -3 - 11/3 = $-\frac{9}{3} - \frac{11}{3} = -\frac{20}{3}$

- (xy + xy) = -33 + (-33) = -66 = $-\frac{198}{3}$

- (x + y) = 8 = $\frac{24}{3}$

Sum:

$$
-\frac{20}{3} + (-\frac{198}{3}) + \frac{24}{3} = \frac{-20 - 198 + 24}{3} = \frac{-194}{3}
$$

So, the exact value of the expression is:

$$
\boxed{
-\frac{194}{3}
}
$$

or approximately -64.6667, confirming our earlier decimal approximation.

Analytical Insights and Contextual Interpretation

Mathematical Significance of the Expression

The expression combines various algebraic operations—subtraction, multiplication, addition, and division—within a single formula. Its evaluation demonstrates the importance of understanding variable assignments and their implications on the overall calculation.

Key observations include:

- The importance of precise substitution: Small errors in replacing variables can significantly affect the final result.
- The combined effect of multiple operations: Addition of products and division components alters the complexity of the calculation.
- The significance of fractional arithmetic: Expressing parts as fractions prevents rounding errors and maintains exactness.

Educational Implications

Problems like this serve as excellent pedagogical tools for:

- Reinforcing the importance of order of operations (PEMDAS/BODMAS).
- Demonstrating how to handle mixed operations involving division and multiplication.
- Encouraging precise substitution and avoiding common pitfalls such as misinterpretation of variables.

Critical Analysis and Broader Context

Potential Ambiguities in the Original Problem

Despite the straightforward calculation, the original statement could be

confusing due to:

- Ambiguity in variable case sensitivity: Should uppercase or lowercase be used?
- The expression's notation: Is the division meant to apply only to y or to the entire numerator?
- The sign of the final answer: The problem mentions the answer is "-", which might imply the result is negative, consistent with our calculation.

To clarify these points:

- It’s standard in algebra to treat variables as symbols; case sensitivity depends on context.
- Parentheses clarify operation precedence.
- The problem's statement suggests the answer is negative, aligning with our calculated approximate value.

Mathematical Rigor and Verification

Using precise fractional arithmetic ensures the correctness of the result. It’s crucial to verify calculations at each step, especially when dealing with division and multiple operations.

Conclusion: Final Reflection and Educational Takeaways

The analysis of the problem "Let X = (4-7) and Y = (4+7), then value of (x - y/3) + (xy + xy) + (x + y) is -" reveals a methodical approach to algebraic problem solving. By clearly defining variables, performing precise substitutions, and leveraging both decimal and fractional calculations, we arrive at a definitive answer: -\(\frac{194}{3}\).

This exercise underscores the importance of:

- Careful variable interpretation
- Accurate arithmetic, especially with fractions
- Systematic problem decomposition

Moreover, it highlights the educational value of such problems in strengthening foundational algebra skills, critical thinking, and attention to detail. Whether for students, educators, or enthusiasts, mastering these techniques enriches one’s mathematical proficiency and prepares for more complex analytical challenges.

In essence, the problem exemplifies the elegance and rigor of algebraic reasoning, serving as a testament to the power of methodical calculation and careful interpretation in mathematical problem solving.

Let X 4 7 And Y 4 7 Then Value Of X Y 3 Xy Xy X Y Is

Let X 4 7 And Y 4 7 Then Value Of X Y 3 Xy Xy X Y Is

Related Articles

- What Are The Skills That Most Leads To Success In The Workplace Is?.
- Toby Arranges The Number Cards Below To Make A Number That Gives 8.3
- What Is The Distance Between The Following Points?WILL GIVE BRAINLIEST

Back to Home