Select All Of The Expressions Equivalent To (0.5p + 7) + (0.3p-6).A.1 +0.8pB.-6.5p+7.3C.7.5p - 5.7D.0.8p

Select All Of The Expressions Equivalent To (0.5p + 7) + (0.3p - 6). A. 1 + 0.8p B. -6.5p + 7.3 C. 7.5p - 5.7 D. 0.8p

Understanding the Problem: Finding Equivalent Expressions

Mathematics often involves simplifying algebraic expressions to identify equivalent forms. The problem at hand asks us to determine which of the provided options are equivalent to the expression:

$$
(0.5p + 7) + (0.3p - 6)
$$

This requires a thorough understanding of combining like terms, simplifying expressions, and verifying equivalence through algebraic manipulation.

Step 1: Simplify the Given Expression

Before comparing the options, let's first simplify the expression:

$$
(0.5p + 7) + (0.3p - 6)
$$

\]

This involves adding the two binomials, which is essentially combining like terms:

- Combine the coefficients of \(p\):

\[
0.5p + 0.3p = 0.8p
\]

- Combine the constants:

\[
7 - 6 = 1
\]

Thus, the simplified form of the original expression is:

\[
0.8p + 1
\]

Step 2: Analyze Each Option to Check for Equivalence

Now that we know the simplified expression is \(0.8p + 1\), we can compare it to each of the provided options:

- Option A: 1 + 0.8p
- Option B: -6.5p + 7.3
- Option C: 7.5p - 5.7

- Option D: 0.8p

Let's evaluate each.

Option A: 1 + 0.8p

- This is algebraically identical to $0.8p + 1$, just written in a different order.
- Conclusion: It is equivalent to the simplified form.

Option B: -6.5p + 7.3

- This has different coefficients and constants compared to $0.8p + 1$.
- Conclusion: Not equivalent.

Option C: 7.5p - 5.7

- Significantly different coefficients and constants.
- Conclusion: Not equivalent.

Option D: 0.8p

- Lacks the constant term $+1$, so it's not the same as the simplified expression.
- Conclusion: Not equivalent.

Step 3: Final Selection of Equivalent Expressions

Based on the comparison:

- Option A matches the simplified form exactly.
- Options B, C, D do not match the simplified expression.

Therefore, the only equivalent expression is Option A: 1 + 0.8p.

Additional Insights: Why Recognizing Equivalent Expressions Matters

Understanding how to recognize equivalent expressions is an essential skill in algebra. It enables students and professionals to:

1. Verify solutions in algebraic equations.
2. Simplify complex expressions for easier manipulation.
3. Identify equivalent forms for problem-solving efficiency.
4. Understand deeper relationships between algebraic expressions.

Common Mistakes When Comparing Algebraic Expressions

While comparing expressions, students often make errors such as:

- Ignoring the order of terms, especially with addition, since it doesn't affect the sum.
- Confusing coefficients and constants, leading to incorrect conclusions.
- Overlooking the importance of signs (+ or -) in constants and coefficients.
- Not simplifying expressions fully before comparison.

To avoid these mistakes:

- Always simplify both expressions completely.
- Write expressions in a standard form: constants and like terms grouped.
- Double-check the coefficients and constants after simplification.

Practical Applications of Simplifying Algebraic Expressions

The ability to simplify and compare algebraic expressions is crucial across many fields, including:

1. Engineering

- Simplifying complex formulas to optimize calculations.

- Verifying the equivalence of different circuit equations.

2. Computer Science

- Optimizing algorithms by simplifying expressions.
- Validating code that involves algebraic computations.

3. Economics and Finance

- Simplifying financial formulas to analyze economic models.
- Comparing different profit or cost functions for equivalence.

4. Education

- Building foundational skills in algebra.
- Developing problem-solving strategies.

Summary: How to Identify Equivalent Algebraic Expressions

To determine whether two expressions are equivalent:

1. Rewrite both expressions in standard form, combining like terms.
2. Compare coefficients of similar terms.

3. Compare constant terms.

4. If all corresponding terms match, the expressions are equivalent.

5. Use substitution if necessary: pick a specific value for p and see if both expressions yield the same result.

Example: Using substitution for verification.

Suppose $p = 2$:

- Original simplified expression: $0.8(2) + 1 = 1.6 + 1 = 2.6$
- Option A: $1 + 0.8(2) = 1 + 1.6 = 2.6$

Both yield 2.6, confirming equivalence.

Test with another value, e.g., $p = -1$:

- Original: $0.8(-1) + 1 = -0.8 + 1 = 0.2$
- Option A: $1 + 0.8(-1) = 1 - 0.8 = 0.2$

Again, they match, confirming that Option A is equivalent.

Conclusion: The Correct Answer

In conclusion, after simplifying the given expression and analyzing each option, the only expression equivalent to $(0.5p + 7) + (0.3p - 6)$ is Option A: 1 + 0.8p.

This exercise highlights the importance of algebraic simplification, careful comparison, and verification through substitution. Mastering these skills enhances problem-solving efficiency and deepens understanding of algebraic relationships, which are foundational in higher mathematics, science, engineering, and many other fields.

Keywords: algebra, equivalent expressions, simplifying algebraic expressions, combining like terms, algebra practice, mathematical skills, expression comparison, algebraic manipulation

Frequently Asked Questions

Which of the following expressions are equivalent to (0.5p + 7) + (0.3p - 6)?

A. 1 + 0.8p

What is the simplified form of (0.5p + 7) + (0.3p - 6)?

0.8p + 1

Does option B, -6.5p + 7.3, simplify to the same as (0.5p + 7) + (0.3p - 6)?

No, because -6.5p + 7.3 is not equivalent to 0.8p + 1.

Which expression among the options correctly represents the sum (0.5p + 7) + (0.3p - 6)?

A. 1 + 0.8p

Is option D, 0.8p, equivalent to the sum of (0.5p + 7) + (0.3p – 6)?

No, because the sum simplifies to 0.8p + 1, not just 0.8p.

What is the correct simplified expression for (0.5p + 7) + (0.3p – 6)?

0.8p + 1

Additional Resources

Select All Of The Expressions Equivalent To (0.5p + 7) + (0.3p - 6)

When approaching algebraic expressions, it is crucial to understand how to simplify and compare different expressions to identify equivalence. The expression (0.5p + 7) + (0.3p - 6) presents a typical example where combining like terms helps determine which options are equivalent. Correctly selecting all expressions equivalent to this sum requires careful algebraic simplification and comparison with given expressions. This article aims to thoroughly analyze the given expression, simplify it step-by-step, evaluate each option provided, and identify all equivalent expressions with detailed reasoning.

Understanding the Expression: (0.5p + 7) + (0.3p – 6)

Before comparing with other expressions, it's essential to understand and simplify (0.5p + 7) + (0.3p - 6).

Step 1: Expand and Group Like Terms

The given expression involves two binomials added together:

- First binomial: 0.5p + 7
- Second binomial: 0.3p - 6

Adding these, we combine the terms with 'p' and the constant terms separately:

$$
(0.5p + 7) + (0.3p - 6) = 0.5p + 0.3p + 7 - 6
$$

Step 2: Simplify

- Combine like terms involving 'p':

$$
0.5p + 0.3p = 0.8p
$$

- Combine constants:

$$
7 - 6 = 1
$$

Therefore, the simplified form of the original expression is:

$$
0.8p + 1
$$

This is the core expression to compare with the options provided.

Analysis of Given Options

The options are as follows:

A. 1

B. -6.5p + 7.3

C. 7.5p - 5.7

D. 0.8p

Our goal is to determine which of these expressions are equivalent to 0.8p + 1.

Evaluating Each Option

Option A: 1

- Expression: 1 (a constant)
- Comparison: Our simplified expression is 0.8p + 1, which varies depending on the value of p.
- Conclusion: Only if p = 0, both expressions are equal (since 0.8(0) + 1 = 1). However, in algebra, equivalence must hold for all values of p.
- Result: Not equivalent in general form.

Option B: -6.5p + 7.3

- Expression: -6.5p + 7.3
- Comparison: Our simplified expression is 0.8p + 1.
- Analysis: The coefficients of p differ (0.8 vs. -6.5), and the constants differ (1 vs. 7.3).
- Conclusion: Not equivalent.

Option C: 7.5p - 5.7

- Expression: 7.5p - 5.7
- Comparison: Our simplified expression is 0.8p + 1.
- Analysis: The coefficients of p differ greatly (7.5 vs. 0.8), and constants differ (-5.7 vs. 1).
- Conclusion: Not equivalent.

Option D: 0.8p

- Expression: 0.8p
- Comparison: Our simplified expression is 0.8p + 1.
- Analysis: This expression lacks the constant term +1, so they are not equal unless p is such that 0.8p + 1 = 0.8p, which only happens when 1 = 0, an impossibility.
- Conclusion: Not equivalent in general.

Summary of Findings

From the detailed comparison, the only potential candidate for equivalence is a constant expression or

a form that simplifies to 0.8p + 1.

- Option A (1): Only equal at p=0, not generally equivalent.
- Option D (0.8p): Lacks the +1, hence not equivalent.
- Options B and C: Different coefficients and constants, hence not equivalent.

Are There Any Equivalent Expressions? A Deeper Look

Given the options, none match the simplified form 0.8p + 1 exactly. However, the question asks to select all of the expressions equivalent to the original sum. Since none of the options directly match 0.8p + 1 for all p, it appears that the only expression equivalent to the original is the one that simplifies to the same form, which is 0.8p + 1.

But wait! The options do not include 0.8p + 1 explicitly. The closest is option D, 0.8p, which is missing the +1 term. Therefore, unless the question allows for partial equivalence at specific values of p, none of the options are fully equivalent for all p.

Key Takeaways and Clarifications

- Algebraic equivalence requires that two expressions be equal for all values of the variable p.
- The original sum simplifies to 0.8p + 1.
- The options provided do not include 0.8p + 1.
- Options A, B, and C are not equivalent to 0.8p + 1 because their coefficients or constants differ.
- Option D (0.8p) is only equivalent to 0.8p + 1 when p satisfies 0.8p + 1 = 0.8p, which is impossible

unless 1 = 0.

- Therefore, none of the options are fully equivalent expressions.

Final Conclusion

None of the provided options (A, B, C, D) are equivalent to the original expression (0.5p + 7) + (0.3p - 6). The correct simplified form is 0.8p + 1, which does not match any of the options exactly.

Key takeaway: When identifying equivalent expressions, always simplify fully and compare coefficients and constants. Options that are only similar at specific points or for specific values of p do not qualify as equivalent in the general algebraic sense.

Additional Tips for Similar Problems

- Always expand parentheses and combine like terms before comparison.
- Confirm whether equivalence is for all values of the variable or only specific ones.
- Watch out for missing constant terms or coefficients that change the entire expression.
- Use substitution of specific values of p to test potential equivalences when unsure.

In summary, the key to solving such problems is careful algebraic simplification and understanding the criteria for equivalence.

Select All Of The Expressions Equivalent To 0 5p 7 0 3p 6 A 1 0 8pb 6 5p 7 3c 7 5p 5 7d 0 8p

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