

What Is The Product Of $3x^4$ And $5x^2 + 2x + 6$. Write Your Answer In Standard Form. Part A: SHOW WORK Part B:

Understanding the Problem: What Is The Product Of $3x^4$ And $5x^2 + 2x + 6$. Write Your Answer In Standard Form. Part A: SHOW WORK Part B:

In this article, we will analyze and solve the algebraic expression involving the multiplication of two polynomials: $3x^4$ and $5x^2 + 2x + 6$. The goal is to find their product in standard form, which involves carefully performing polynomial multiplication and simplifying the result. We will also break down each step in Part A, showing the detailed work, and then present the final answer in Part B.

Interpreting the Expression

Clarifying the Terms

- The phrase $3x^4$ is somewhat ambiguous and appears to be missing an operator or may be a typo. Typically, in algebra, expressions are written with explicit multiplication symbols or as combined terms.
- Given standard algebraic notation, it is reasonable to interpret $3x^4$ as $3x^4$, which simplifies to $12x$.
- The second polynomial, $5x^2 + 2x + 6$, is clear and standard.

Thus, the problem reduces to multiplying $12x$ by $5x^2 + 2x + 6$.

Part A: Show Work

Step 1: Write the multiplication expression

$$(12x) (5x^2 + 2x + 6)$$

Step 2: Distribute $12x$ across each term in the second polynomial

- Multiply $12x$ by $5x^2$
- Multiply $12x$ by $2x$
- Multiply $12x$ by 6

Step 3: Perform each multiplication

1. First term: $12x \cdot 5x^2$

- Multiply coefficients: $12 \cdot 5 = 60$
- Add exponents for x : $x \cdot x^2 = x^{\{1+2\}} = x^3$
- Result: $60x^3$

2. Second term: $12x \cdot 2x$

- Multiply coefficients: $12 \cdot 2 = 24$
- Add exponents: $x \cdot x = x^{\{1+1\}} = x^2$
- Result: $24x^2$

3. Third term: $12x \cdot 6$

- Multiply coefficients: $12 \cdot 6 = 72$
- Since 6 is a constant, the x remains as is: $72x$

Step 4: Write the product in standard form

Now, combine all the terms obtained:

$$60x^3 + 24x^2 + 72x$$

This is the product expressed in standard polynomial form, arranged from highest to lowest degree.

Part B: Final Answer in Standard Form

The product of $3x \cdot 4$ (interpreted as $12x$) and $5x^2 + 2x + 6$ is:

$$60x^3 + 24x^2 + 72x$$

This polynomial in standard form clearly shows the degrees of each term decreasing from 3 to 1, with coefficients simplified and combined properly.

Additional Notes and Clarifications

Understanding Polynomial Multiplication

- Polynomial multiplication involves distributing each term in the first polynomial across all terms in the second polynomial, then combining like terms if necessary.
- The degree of the resulting polynomial is the sum of the degrees of the multiplied terms.
- Coefficients are multiplied directly, and exponents of like bases are added.

Why Standard Form Matters

Writing polynomials in standard form — from the highest degree to the lowest — helps in understanding the polynomial's degree, leading coefficient, and overall structure. It is essential in algebra for simplifying, comparing, and performing further operations like division or factoring.

Summary

To summarize, the key steps in solving polynomial multiplication problems include interpreting the given expressions correctly, applying the distributive property systematically, performing coefficient and exponent operations diligently, and finally writing the resulting polynomial in standard form. In this specific problem, after interpreting the initial phrase, we multiplied $12x$ by $5x^2 + 2x + 6$ to obtain the product $60x^3 + 24x^2 + 72x$.

Conclusion

Understanding how to multiply polynomials and express the result in standard form is a fundamental skill in algebra. It enables solving more complex equations and analyzing polynomial functions. Always ensure clarity in the initial expressions and perform each step carefully to arrive at correct, simplified answers.

Frequently Asked Questions

What is the product of $3x$, 4 , and $5x^2 + 2x + 6$? Write your answer in standard form. Part A: Show work. Part B: Provide the final answer.

Part A: Multiply $3x$ by 4 to get $12x$. Then multiply this result by $(5x^2 + 2x + 6)$:

$$12x \cdot 5x^2 = 60x^3$$

$$12x \cdot 2x = 24x^2$$

$$12x \cdot 6 = 72x$$

Part B: The product in standard form is $60x^3 + 24x^2 + 72x$.

How do you find the product of $3x$, 4 , and $5x^2 + 2x + 6$ in standard form? Show your work.

First, multiply $3x$ by 4 to get $12x$. Then, multiply $12x$ by each term of $(5x^2 + 2x + 6)$:

$$12x \cdot 5x^2 = 60x^3$$

$$12x \cdot 2x = 24x^2$$

$$12x \cdot 6 = 72x$$

Final product: $60x^3 + 24x^2 + 72x$.

What is the simplified product of $3x$, 4 , and $(5x^2 + 2x + 6)$? Provide the steps and answer.

Step 1: Multiply $3x$ by 4 to get $12x$.

Step 2: Multiply $12x$ by each term in $(5x^2 + 2x + 6)$:

$$- 12x \cdot 5x^2 = 60x^3$$

$$- 12x \cdot 2x = 24x^2$$

$$- 12x \cdot 6 = 72x$$

Final answer: $60x^3 + 24x^2 + 72x$.

In algebra, how do you multiply $3x$, 4 , and $(5x^2 + 2x +$

6)? Show the step-by-step process in standard form.

First, multiply $3x$ by 4 : $3x \cdot 4 = 12x$.

Next, multiply $12x$ by each term of $(5x^2 + 2x + 6)$:

$$- 12x \cdot 5x^2 = 60x^3$$

$$- 12x \cdot 2x = 24x^2$$

$$- 12x \cdot 6 = 72x$$

Therefore, the final product is $60x^3 + 24x^2 + 72x$.

Calculate the product of $3x$, 4 , and the polynomial $5x^2 + 2x + 6$. Present your solution in standard form.

Multiply $3x$ by 4 : $12x$.

Then multiply $12x$ by each term of the polynomial:

$$- 12x \cdot 5x^2 = 60x^3$$

$$- 12x \cdot 2x = 24x^2$$

$$- 12x \cdot 6 = 72x$$

Final answer: $60x^3 + 24x^2 + 72x$.

What is the expanded form of the product of $3x$, 4 , and $(5x^2 + 2x + 6)$? Show detailed work.

Step 1: $3x \cdot 4 = 12x$.

Step 2: Distribute $12x$ across the polynomial:

$$- 12x \cdot 5x^2 = 60x^3$$

$$- 12x \cdot 2x = 24x^2$$

$$- 12x \cdot 6 = 72x$$

Final result in standard form: $60x^3 + 24x^2 + 72x$.

How do you compute the product of $3x$, 4 , and $5x^2 + 2x + 6$? Include the steps and final answer in standard form.

First, multiply $3x$ by 4 : $12x$.

Next, multiply $12x$ by each term of the polynomial:

$$- 12x \cdot 5x^2 = 60x^3$$

$$- 12x \cdot 2x = 24x^2$$

$$- 12x \cdot 6 = 72x$$

The final product in standard form is $60x^3 + 24x^2 + 72x$.

Identify the steps to multiply $3x$, 4 , and $(5x^2 + 2x + 6)$ and write the answer in standard form.

Step 1: Multiply $3x$ by 4 : $12x$.

Step 2: Multiply $12x$ by each term:

$$- 12x \cdot 5x^2 = 60x^3$$

$$- 12x \cdot 2x = 24x^2$$

$$- 12x \cdot 6 = 72x$$

Final answer: $60x^3 + 24x^2 + 72x$.

Additional Resources

What Is The Product Of $3x^4$ And $5x^2 + 2x + 6$? Write Your Answer In Standard Form.

Introduction

When tackling algebraic expressions, understanding how to multiply polynomials is a fundamental skill. In particular, finding the product of a monomial such as $3x^4$ and a polynomial like $5x^2 + 2x + 6$ involves applying the distributive property — often referred to as the FOIL method for binomials but extended to larger polynomials. This process requires multiplying each term of the second polynomial by the monomial, then simplifying the resulting expression into standard form, which arranges terms in descending order of degree.

In this article, we explore what is the product of $3x^4$ and $5x^2 + 2x + 6$, illustrating the step-by-step process to arrive at the answer, and explaining key concepts for clarity. Whether you're a student brushing up on polynomial multiplication or someone interested in algebraic expressions, this comprehensive guide will enhance your understanding.

Part A: Show Work

Let's break down the problem:

Find the product of
 $3x^4$ and
 $5x^2 + 2x + 6$.

Step 1: Recognize the structure

- The first expression, $3x^4$, is a monomial (single term).
- The second expression, $5x^2 + 2x + 6$, is a polynomial with three terms.

Step 2: Apply the distributive property

To multiply a monomial by a polynomial, multiply the monomial by each term in the polynomial:

- Multiply $3x^4$ by $5x^2$.
- Multiply $3x^4$ by $2x$.
- Multiply $3x^4$ by 6 .

Step 3: Perform each multiplication

Let's compute each term carefully:

1. $3x^4 \cdot 5x^2$

- Coefficient: $3 \cdot 5 = 15$

- Variable: $x^4 \cdot x^2 = x^{4+2} = x^6$

- Result: $15x^6$

2. $3x^4 \cdot 2x$

- Coefficient: $3 \cdot 2 = 6$

- Variable: $x^4 \cdot x^1 = x^{4+1} = x^5$

- Result: $6x^5$

3. $3x^4 \cdot 6$

- Coefficient: $3 \cdot 6 = 18$

- Variable: $x^4 \cdot x^0 = x^4$ (since multiplying by 1)

- Result: $18x^4$

Step 4: Write the final expression in standard form

Combine all the terms:

$$15x^6 + 6x^5 + 18x^4$$

This is the product in standard polynomial form, ordered from highest to lowest degree.

Part B: Analysis and Insights

The significance of polynomial multiplication

Polynomial multiplication, especially involving monomials and polynomials, is a cornerstone of algebra. It allows us to expand expressions, simplify equations, and analyze algebraic functions. Recognizing how to systematically distribute and combine like terms is crucial for solving more complex problems, including factoring, solving equations, and calculus.

Why standard form matters

Expressing the final product in standard form—descending powers of x —is essential for clarity, comparison, and further algebraic manipulation. It makes it easier to identify the degree of the polynomial, compare it with other expressions, and perform operations like addition or differentiation.

Tips for multiplying polynomials

- Distribute systematically: Always multiply each term in the second polynomial by the monomial or each term in the first polynomial if both are polynomials.
- Combine like terms: After multiplication, combine terms with the same degree.
- Maintain order: Arrange the terms from the highest degree to the lowest for clarity.
- Check your work: Verify coefficients and exponents, especially when multiplying variables with exponents.

Summary of the process

Step	Action	Explanation
1	Recognize the structure	Monomial times polynomial
2	Distribute	Multiply the monomial by each polynomial term
3	Calculate each product	Multiply coefficients and add exponents for variables
4	Write in standard form	Arrange from highest to lowest degree

Final answer

The product of $3x^4$ and $5x^2 + 2x + 6$ in standard form is:

$$15x^6 + 6x^5 + 18x^4$$

Conclusion

Understanding how to multiply a monomial by a polynomial is a fundamental skill, serving as a building block for more advanced algebraic concepts. By carefully applying the distributive property, multiplying coefficients and adding exponents, and then organizing the results in standard form, students and learners can confidently simplify complex expressions. Practice with similar problems enhances algebraic fluency, paving the way for success in higher-level mathematics.

If you're aiming to master polynomial multiplication, keep practicing with different combinations of monomials and polynomials, and always double-check your work for accuracy. As you become more comfortable, you'll find that algebraic expressions become increasingly manageable and intuitive.

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