

. Which Of The Following Is Equivalent To The Product Of 2 And 3 Is Increased By 7?A. $(2 + 3) + 7$ B. $2(3)$

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Understanding the Problem: Analyzing the Mathematical Expression

Mathematics often involves understanding how different expressions relate to each other, especially when simplifying or solving equations. The question at hand asks us to determine which of the given options is equivalent to "the product of 2 and 3 increased by 7." The options provided are:

- A. $(2 + 3) + 7$
- B. $2(3)$

Before diving into the solutions, it's essential to understand the key terms used in the problem:

What does "product of 2 and 3" mean?

The product of two numbers is the result of multiplying them together. In this case, the product of 2 and 3 is:

$$\begin{aligned} & \backslash[\\ & 2 \times 3 \\ & \backslash] \end{aligned}$$

which equals 6.

What does "increased by 7" mean?

In mathematics, "increased by 7" means adding 7 to the previous value. So, if you have some value (x) , then increasing it by 7 is:

$$\begin{aligned} & \backslash[\\ & x + 7 \\ & \backslash] \end{aligned}$$

Formulating the Expression

Putting these together, the phrase "the product of 2 and 3 increased by 7" can be mathematically expressed as:

$$\backslash[$$

$$(2 \times 3) + 7$$

or simply:

$$6 + 7 = 13$$

Now, the question is which of the options provided is equivalent to this expression.

Comparing the Given Options

Let's analyze each option carefully to understand their expressions and see if they match the original problem.

Option A: $((2 + 3) + 7)$

This expression involves the sum of 2 and 3, which is:

$$2 + 3 = 5$$

Adding 7 gives:

$$5 + 7 = 12$$

Is this equivalent to the original?

No. The original expression involves multiplication (product), while Option A involves addition inside the parentheses. Therefore, Option A is not equivalent to "product of 2 and 3 increased by 7."

Option B: $(2(3))$

This expression is the multiplication of 2 and 3, which is:

$$2 \times 3 = 6$$

Is this equivalent to the original?

No, because the original expression adds 7 to the product, resulting in 13, not 6. So, Option B is also not equivalent to the full expression "product of 2 and 3 increased by 7."

Clarifying the Correct Expression

Given the options, the expression that correctly represents "the product of 2 and 3 increased by 7" is:

$$\backslash[(2 \times 3) + 7 \backslash]$$

which simplifies to:

$$\backslash[6 + 7 = 13 \backslash]$$

Note that neither Option A nor Option B directly matches this expression. However, based on the options provided, if the question intends to find the expression corresponding to the phrase, the correct mathematical expression is:

$$\backslash[(2 \times 3) + 7 \backslash]$$

Visualizing the Mathematical Concepts

Multiplication (Product)

Multiplication is a shortcut for repeated addition. For example:

$$\backslash[2 \times 3 \backslash]$$

means adding 2 three times:

$$\backslash[2 + 2 + 2 = 6 \backslash]$$

Addition (Increased by)

Adding 7 to a number:

$$\backslash[\text{Number} + 7 \backslash]$$

For instance, if the number is 6, then:

$$\begin{aligned} & \backslash[\\ & 6 + 7 = 13 \\ & \backslash] \end{aligned}$$

Combining Operations

When a problem involves both, like "product of 2 and 3 increased by 7," it combines multiplication and addition:

$$\begin{aligned} & \backslash[\\ & (2 \times 3) + 7 \\ & \backslash] \end{aligned}$$

which simplifies to:

$$\begin{aligned} & \backslash[\\ & 6 + 7 = 13 \\ & \backslash] \end{aligned}$$

Mathematical Properties Relevant to the Problem

Understanding basic properties of operations helps clarify the problem:

Commutative Property of Addition and Multiplication

- Addition:

$$\begin{aligned} & \backslash[\\ & a + b = b + a \\ & \backslash] \end{aligned}$$

- Multiplication:

$$\begin{aligned} & \backslash[\\ & a \times b = b \times a \\ & \backslash] \end{aligned}$$

Associative Property

- Addition:

$$\begin{aligned} & \backslash[\\ & (a + b) + c = a + (b + c) \\ & \backslash] \end{aligned}$$

- Multiplication:

$$\backslash[$$

$$(a \times b) \times c = a \times (b \times c)$$

$$\backslash]$$

Distributive Property

- Distributing multiplication over addition:

$$\backslash[$$

$$a \times (b + c) = a \times b + a \times c$$

$$\backslash]$$

In this problem, the distributive property is relevant if we consider rewriting expressions, but the main focus remains on understanding the difference between addition and multiplication.

Practical Applications and Real-World Examples

Understanding how to interpret and manipulate such expressions is crucial in many real-life contexts, including:

Budgeting and Finance

- Calculating total expenses when some amounts are multiplied (like price per item times quantity) and then increased by additional costs or taxes.

Engineering and Science

- Applying formulas where terms are multiplied and then adjusted with offsets, such as calculating force, energy, or other quantities.

Education and Learning

- Building foundational skills in algebra, which are essential for advanced mathematics, physics, computer science, and economics.

Common Mistakes and Misconceptions

While working through similar problems, students often encounter errors such as:

- Confusing addition and multiplication operations.
- Forgetting to apply parentheses correctly, which can change the order of operations.
- Misinterpreting the phrase "increased by" as multiplication instead of addition.

It's essential to carefully analyze each part of the phrase and translate it into the correct mathematical expression.

Summary and Key Takeaways

- The phrase "product of 2 and 3 increased by 7" translates to:

$$\begin{aligned} & \backslash \\ & (2 \times 3) + 7 \\ & \backslash \end{aligned}$$

- This simplifies to $6 + 7 = 13$.
- Option A: $((2 + 3) + 7 = 12)$, which is not equivalent.
- Option B: $(2 \times 3 = 6)$, which is only the product, not increased by 7.
- Therefore, neither Option A nor Option B fully captures the original phrase, but the true expression involves both multiplication and addition.

Final Notes for Students and Learners

Mastering the translation of word problems into algebraic expressions is a vital skill. Always:

- Read carefully and identify key words like "product," "times," "increased by," "sum," etc.
- Use parentheses to clarify the order of operations.
- Simplify step-by-step to verify your results.

Practicing these skills enhances problem-solving abilities and prepares you for more complex mathematical challenges.

Additional Resources

- Algebra Basics: Understanding variables, expressions, and equations.
- Order of Operations: PEMDAS/BODMAS rules.
- Word Problem Strategies: How to translate real-world scenarios into mathematical expressions.

By mastering these concepts, you'll be well-equipped to analyze similar problems confidently and accurately.

Frequently Asked Questions

What is the mathematical expression for 'The product of 2 and 3 increased by 7'?

$$2 \times 3 + 7$$

Which option correctly represents 'The product of 2 and 3 increased by 7'?

Option B: $2(3) + 7$

Is '2(3)' equivalent to '2 × 3'?

Yes, '2(3)' is equivalent to '2 × 3'.

Does option A, '(2 + 3) + 7', represent the same value as the product of 2 and 3 increased by 7?

No, '(2 + 3) + 7' equals 12, whereas '2 × 3 + 7' equals 13.

Which expression correctly increases the product of 2 and 3 by 7?

$$2(3) + 7$$

Additional Resources

Which Of The Following Is Equivalent To The Product Of 2 And 3 Is Increased By 7? A. $(2 + 3) + 7$ B. $2(3)$

Understanding basic arithmetic expressions is fundamental not only for students but also for anyone engaging in everyday calculations. At first glance, the question may seem straightforward, but it opens the door to exploring key concepts like multiplication, addition, and how they relate within algebraic expressions. The problem posed—"Which of the following is equivalent to the product of 2 and 3 increased by 7?"—serves as an excellent example to demonstrate how mathematical language translates into operations. This article will dissect the problem, interpret the options provided, and clarify how to determine the equivalent expression through a detailed, reader-friendly approach.

Deciphering the Problem Statement

Breaking Down the Language

The phrase "the product of 2 and 3 increased by 7" contains several mathematical clues:

- Product of 2 and 3: This indicates multiplication, specifically 2 multiplied by 3.
- Increased by 7: This suggests we should add 7 to the result of the multiplication.

Putting it together, the phrase describes a two-step operation:

1. Calculate the product of 2 and 3.
2. Add 7 to that product.

Mathematically, this can be expressed as:

$$(2 \times 3) + 7$$

The fundamental question is: Which expression among the options matches this calculation?

Analyzing the Given Options

The options provided are:

- A. $(2 + 3) + 7$
- B. $2(3)$

Let's examine each carefully.

Option A: $(2 + 3) + 7$

This expression involves adding 2 and 3 first, then adding 7:

- Compute $2 + 3 = 5$
- Then, $5 + 7 = 12$

So, the value of Option A is 12.

Option B: $2(3)$

This is a straightforward multiplication:

- 2 multiplied by 3, which equals 6.

Understanding Which Expression Is Correct

The key to solving this problem lies in recognizing the difference in operations:

- Option A computes $(2 + 3) + 7$, which is adding 2 and 3 first, then adding 7.
- Option B computes 2 multiplied by 3 directly, then, as per the notation, the expression seems to be just 2 times 3.

But the original question asks: "Which is equivalent to the product of 2 and 3 increased by 7?"

Mathematically, that is:

$$(2 \times 3) + 7$$

Now, compare this with each option:

- Option A: $(2 + 3) + 7 = 5 + 7 = 12$
- Option B: $2(3) = 6$

The actual product of 2 and 3 is 6, and increasing it by 7 yields:

$$6 + 7 = 13$$

Thus, neither Option A nor Option B exactly matches the expression $(2 \times 3) + 7$, which equals 13.

However, since the options provided are only $(2 + 3) + 7$ and $2(3)$, and the question asks for the expression equivalent to "the product of 2 and 3 increased by 7," the closest and correct mathematical interpretation aligns with:

$$(2 \times 3) + 7$$

which is not explicitly among the options.

Clarifying the Correct Interpretation

Given the options, the key is understanding what each represents:

- Option A: $(2 + 3) + 7$ — adds 2 and 3 first, then adds 7. This is not the same as multiplying 2 and 3 and then adding 7.
- Option B: $2(3)$ — directly computes the product of 2 and 3, but does not include the +7

part.

Therefore, neither Option A nor B exactly matches the expression "product of 2 and 3 increased by 7," which mathematically is $(2 \times 3) + 7$.

Possible Misinterpretation and Clarification

It appears there might be some ambiguity in the options or in the question itself. Let's clarify:

- The correct expression for "the product of 2 and 3 increased by 7" is $(2 \times 3) + 7$.
- If the options aim to test understanding of multiplication and addition, then:
 - Option A is actually adding 2 and 3 first, then adding 7, which is not equivalent to multiplying 2 and 3 then adding 7.
 - Option B is simply the product of 2 and 3, without the added 7.

Thus, if the goal is to find an expression equivalent to $(2 \times 3) + 7$, neither A nor B matches exactly, but the expression $2(3) + 7$ (which is not listed) would be correct.

Conclusion: Understanding the Correct Mathematical Expression

This exploration underscores the importance of precise language and understanding in mathematics. When faced with the phrase "the product of 2 and 3 increased by 7," the correct algebraic expression is:

$$(2 \times 3) + 7$$

which simplifies to:

$$6 + 7 = 13$$

The options provided:

- A. $(2 + 3) + 7$ (which equals 12)
- B. $2(3)$ (which equals 6)

do not directly match the intended meaning. Instead, they illustrate common misconceptions:

- Option A demonstrates adding before multiplying, which is a different operation (addition

vs. multiplication).

- Option B demonstrates the multiplication part but omits the increase by 7.

Educational Takeaways for Students and Learners

1. Pay Attention to Key Words: Words like "product," "increased by," and "sum" dictate the operations to perform.
2. Translate Language into Algebra: Break down the phrase into mathematical operations step-by-step.
3. Remember Operation Precedence: Multiplication should be performed before addition unless parentheses specify otherwise.
4. Verify with Actual Calculations: Plug in the numbers to confirm if the expressions match the intended meaning.
5. Avoid Misinterpretation: Be cautious of expressions that look similar but differ in operation order.

Final Thoughts

While the options given in the question do not perfectly match the algebraic expression for "the product of 2 and 3 increased by 7," understanding the principles behind the operations clarifies the correct approach. The key takeaway is that the expression $(2 \times 3) + 7$ is the precise representation of the phrase's meaning. Recognizing the importance of operation order, translating words into symbols, and verifying calculations are crucial skills for mastering mathematics. Whether in academic contexts or practical scenarios, this fundamental understanding paves the way for clear, accurate problem-solving.

In summary:

- The phrase "product of 2 and 3 increased by 7" corresponds to $(2 \times 3) + 7$.
- Neither Option A nor B fully captures this expression.
- The key is interpreting the phrase correctly and applying the correct order of operations.

By cultivating these skills, learners can confidently decode and solve similar problems, building a solid foundation for more advanced mathematical concepts.

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And 3 Is Increased By 7 A 2 3 7b 2 3

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