

Translate The Sentence Six Less Than The Product Of Four And A Number Is -2 Into An Equation

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When approaching word problems in mathematics, the key is to carefully interpret the language and convert it into an algebraic expression or equation. The sentence "Six less than the product of four and a number is -2" provides specific clues about the relationships between variables and constants. To translate this sentence into an equation, it's essential to understand the meaning of each phrase and how they connect mathematically. This article will guide you step-by-step through the process of translating such sentences into algebraic equations, with a focus on the given problem.

Understanding the Components of the Sentence

Before translating the sentence into an equation, it's important to break down its parts and understand what each segment signifies. The sentence contains several key components:

Identifying the Unknown Variable

- The phrase "a number" indicates the presence of an unknown quantity, which we typically represent with a variable, usually (x) .

Interpreting "the product of four and a number"

- The word "product" signifies multiplication.
- "Four and a number" suggests multiplying 4 by the unknown variable (x) .

Understanding "Six less than"

- The phrase "less than" indicates subtraction.
- "Six less than" means subtracting 6 from something.

Recognizing the equality or relationship

- The phrase "is -2" shows that the expression on the left side equals -2.

Step-by-Step Translation Process

Translating a word problem into an algebraic equation involves several systematic steps:

Step 1: Assign a Variable to the Unknown

- Choose a variable to represent "a number," commonly (x) .

Step 2: Express the Product of Four and the Number

- Translate "the product of four and a number" into $(4x)$.

Step 3: Interpret "Six less than" the Product

- Since "six less than" indicates subtraction, express it as $(4x - 6)$.

Step 4: Set the Expression Equal to -2

- The phrase "is -2" indicates an equality, so set the expression equal to -2:

$$\begin{aligned} & \{ \\ & 4x - 6 = -2 \\ & \} \end{aligned}$$

Step 5: Final Equation

- The complete translation results in the algebraic equation:

$$\begin{aligned} & \{ \\ & 4x - 6 = -2 \\ & \} \end{aligned}$$

This equation now accurately represents the original sentence, ready for solving.

Understanding the Structure of the Equation

The equation $(4x - 6 = -2)$ encapsulates the meaning of the sentence in algebraic form. Let's analyze its components:

Left Side: $(4x - 6)$

- Represents "six less than the product of four and a number."
- $(4x)$: product of 4 and the unknown number (x) .
- Subtracting 6 aligns with "less than."

Right Side: (-2)

- The value to which the expression equals, as stated in the sentence.

Additional Examples and Variations

Different word problems might have similar structures but vary slightly in wording. Here are some examples and their translations:

- **Example 1:** "Three more than twice a number equals ten."
- **Translation:** $(2x + 3 = 10)$

- **Example 2:** "The sum of a number and five is equal to twelve."
- **Translation:** $(x + 5 = 12)$

- **Example 3:** "Five less than triple a number is twenty."
- **Translation:** $(3x - 5 = 20)$

Understanding the pattern of such sentences helps in systematically translating them into equations.

Solving the Equation $(4x - 6 = -2)$

Once the translation is complete, the next step is to solve the equation to find the value of the unknown (x) .

Step 1: Isolate the Variable Term

- Add 6 to both sides to eliminate the constant term on the left:

$$\begin{aligned} & (4x - 6 + 6 = -2 + 6) \\ & (4x = 4) \end{aligned}$$

Step 2: Solve for (x)

- Divide both sides by 4:

$$\begin{aligned} & (\frac{4x}{4} = \frac{4}{4}) \\ & (x = 1) \end{aligned}$$

Solution: The number is $(x = 1)$.

Step 3: Verify the Solution

- Substitute $(x = 1)$ back into the original expression:

$$(4(1) - 6 = 4 - 6 = -2)$$

- The left side equals the right side, confirming that the solution is correct.

Importance of Accurate Translation in Word

Problems

Translating words into equations is a fundamental skill in algebra. Accurate translation ensures correct problem-solving and understanding. Common mistakes include:

1. Misinterpreting "less than" or "more than."
2. Forgetting to set the expression equal to the correct value.
3. Incorrectly translating "product," "sum," or "difference."

By developing a methodical approach—identifying key phrases, assigning variables, and translating step-by-step—you can effectively convert complex sentences into solvable equations.

Conclusion

Translating the sentence "Six less than the product of four and a number is -2" into an algebraic equation involves understanding the language of the problem and carefully expressing each part mathematically. The key steps include:

- Assigning a variable to the unknown.
- Converting descriptive phrases into mathematical operations.
- Setting the resulting expression equal to the given value.

The final equation, $(4x - 6 = -2)$, provides a clear pathway to solving for the unknown. Mastering this translation process enhances problem-solving skills and lays a foundation for tackling more complex algebraic word problems. Remember, clarity in interpretation leads to accuracy in solution.

Frequently Asked Questions

How do I translate the sentence 'Six less than the product of four and a number is -2' into an algebraic equation?

You can translate it as $4x - 6 = -2$, where x represents the number.

What does 'six less than the product of four and a number' mean in algebra?

It means you multiply four by a number (x), then subtract six from that product, which can be written as $4x - 6$.

How can I solve the equation $4x - 6 = -2$ to find the number?

First, add 6 to both sides to get $4x = 4$, then divide both sides by 4 to find $x = 1$.

Why is the equation $4x - 6 = -2$ the correct translation of the sentence?

Because it directly reflects the phrase: 'product of four and a number' ($4x$), 'less than' (subtract 6), and 'equals -2' (set equal to -2).

What are the steps to formulate algebraic expressions from word problems like this?

Identify key components (numbers, operations), assign variables, translate words into mathematical operations, and then write the complete equation accordingly.

Additional Resources

Translate The Sentence Six Less Than The Product Of Four And A Number Is -2 Into An Equation

Understanding how to convert word problems into algebraic equations is a fundamental skill in mathematics that bridges language and numerical reasoning. This process involves carefully analyzing the sentence, identifying the key components, and translating them into symbols and operations that represent the described situation. Today, we focus on a particular sentence: "Six less than the product of four and a number is -2," and explore how to systematically convert it into a formal algebraic equation.

The Importance of Translating Word Problems into Equations

Before diving into the specifics of this sentence, it's crucial to recognize why translating words into equations is an essential skill in mathematics. Word problems are common in real-world scenarios, from calculating costs to determining measurements and predicting outcomes. Being able to set up an

equation based on a written description allows for:

- Structured Problem Solving: It provides a clear pathway to find solutions systematically.
- Critical Thinking: It encourages analyzing language and extracting relevant information.
- Application of Algebra: It bridges natural language with the language of symbols, facilitating more complex problem-solving.

This skill not only helps in academic contexts but also enhances logical reasoning and quantitative literacy necessary in everyday life.

Breaking Down the Sentence: "Six Less Than The Product Of Four And A Number Is -2"

The sentence contains several components that must be carefully identified and interpreted:

- "Six less than": Indicates a subtraction, specifically, subtracting six from some quantity.
- "The product of four and a number": Refers to multiplying a number by four.
- "Is": Represents equality, linking the expression to a value.
- "-2": The value that the expression equals.

To accurately translate this sentence into an equation, let's analyze each part step-by-step.

Step-by-Step Translation Process

1. Assigning a Variable to the Unknown Number

The phrase "a number" indicates an unknown value that we need to represent with a variable. The most common choice is:

- Let x = the number

This simple assignment allows us to express all parts of the sentence algebraically.

2. Expressing "The product of four and a number"

This phrase involves multiplication:

- Product of four and the number = $4 \times x$

This is straightforward: multiply 4 by the variable x .

3. Interpreting "Six less than the product"

The phrase "six less than" indicates that we subtract 6 from the previous expression:

$$\text{"Six less than the product"} = (4 \times x) - 6$$

Note the order: the phrase "less than" means the quantity following it is subtracted from the first.

4. Connecting to the word "is" and the value "-2"

The word "is" signifies equality, so the entire expression is equal to -2:

$$(4 \times x) - 6 = -2$$

This completes the translation process, converting the written sentence into a precise algebraic equation.

Final Equation and Its Significance

The fully translated algebraic equation from the sentence is:

$$(4 \times x) - 6 = -2$$

This equation encapsulates the original problem, enabling us to apply algebraic techniques to find the value of the unknown number.

Solving the Equation: Step-by-Step Approach

Having established the equation, the next logical step is to solve for x . Let's walk through the solution process:

Step 1: Write down the equation

$$(4 \times x) - 6 = -2$$

Step 2: Isolate the term with the variable

Add 6 to both sides of the equation to eliminate the constant term on the left:

$$(4 \times x) - 6 + 6 = -2 + 6$$

which simplifies to:

$$4 \times x = 4$$

Step 3: Solve for x

Divide both sides by 4:

$$(4 \times x) / 4 = 4 / 4$$

which simplifies to:

$$x = 1$$

Result: The number is 1.

Interpreting the Solution in Context

The solution $x = 1$ indicates that the unknown number in the original sentence is 1. To verify, substitute $x=1$ back into the original phrase:

- The product of four and 1 is 4.
- Six less than 4 is $4 - 6 = -2$.
- The statement "Six less than the product of four and a number is -2" holds true when the number is 1.

This verification confirms the correctness of the translation and solution.

Broader Lessons from This Example

This exercise highlights several important principles:

- Careful Reading Is Key: Understanding the nuances of language, such as "less than" and "product of," is vital for accurate translation.
- Variable Choice Matters: Selecting appropriate variables simplifies the process.
- Stepwise Approach Ensures Accuracy: Breaking down the problem into manageable steps prevents errors.
- Verification Reinforces Understanding: Checking the solution in context confirms correctness and deepens comprehension.

Practical Applications and Additional Examples

The ability to translate sentences into equations is crucial across various fields:

- Economics: Converting cost and revenue descriptions into formulas.
- Physics: Translating motion descriptions into equations of movement.
- Engineering: Formulating relationships between variables from textual

specifications.

- Medicine: Quantifying doses based on descriptive instructions.

Additional Examples for Practice:

- "The sum of twice a number and three is fifteen" $\rightarrow 2x + 3 = 15$
- "Five less than triple a number equals nine" $\rightarrow 3x - 5 = 9$
- "The quotient of a number and four is three" $\rightarrow x / 4 = 3$

Practicing these types of translations will strengthen understanding and problem-solving skills.

Conclusion: Mastering the Art of Translation in Mathematics

Converting word problems into algebraic equations is a foundational skill that unlocks the power of mathematics to solve real-world problems. By carefully analyzing language, assigning variables, and systematically translating each phrase, students and practitioners can approach complex problems with confidence and clarity. The example of transforming "Six less than the product of four and a number is -2" into the equation $(4 \times x) - 6 = -2$ illustrates this process vividly, demonstrating how language and symbols intertwine to reveal solutions that are both logical and elegant.

Mastery of this skill enhances not only mathematical proficiency but also critical thinking, making it an invaluable tool in education and beyond.

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