Translate This Sentence Into An Equation.55 Is The Product Of 5 And Mabel's Height.Use The Variable M

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Understanding how to translate verbal statements into algebraic equations is a fundamental skill in mathematics. It allows us to model real-world situations, solve problems efficiently, and develop a deeper comprehension of relationships between quantities. In this article, we will explore the process of converting the sentence "55 is the product of 5 and Mabel's height" into a mathematical equation, using the variable M to represent Mabel's height. We will also delve into related concepts, problem-solving strategies, and practical examples to enhance your algebraic skills.

Introduction to Translating Sentences into Equations

Before diving into the specific problem, it's crucial to understand the general principles behind translating words into equations. This skill involves identifying key components in a sentence—such as quantities, operations, and relationships—and representing them with variables and mathematical symbols.

Key Components to Recognize

- Numbers: Known quantities like 55 or 5.
- Variables: Symbols like M, which stand for unknown or variable quantities.
- Operations: Addition (+), subtraction (−), multiplication (× or ·), and division (÷ or /).
- Relationships: Words like "is," "of," "product," "sum," "difference," indicating how quantities relate.

Step-by-Step Approach to Translating Sentences

1. Read the sentence carefully. Identify all relevant quantities and their relationships.
2. Assign variables to unknown quantities. For example, M for Mabel's height.
3. Identify the operation(s) described. Words like "product" indicate multiplication.
4. Translate the sentence into an algebraic expression. Use the variables and operation symbols.
5. Simplify, if needed, to form an equation.

Applying this method ensures clarity and accuracy when converting verbal descriptions into algebraic equations.

Analyzing the Sentence: "55 Is The Product Of 5 And Mabel's Height."

Let's dissect this specific sentence to understand how to convert it into an algebraic equation.

Understanding the Components

- The number 55: This appears as a known value.
- "The product of 5 and Mabel's height": Indicates multiplication between 5 and Mabel's height.
- Mabel's height: Unknown quantity represented by variable M.

Identifying the Relationship

The sentence states that 55 equals the product of 5 and Mabel's height. In algebraic terms, this is expressed as:

$55 = 5 \times M$

or

$55 = 5M$

This straightforward translation uses the variable M to represent Mabel's height and the multiplication operation to indicate the product.

Formulating the Equation

Based on the analysis, the algebraic equation corresponding to the sentence is:

Equation:

```plaintext
55 = 5M
```

This equation succinctly captures the relationship described in the sentence, providing a foundation for solving for M, or Mabel's height.

Solving the Equation for Mabel's Height

Once the equation is established, the next step often involves solving for the unknown variable—in this case, M.

Steps to Solve 55 = 5M

1. Isolate M: To find M, divide both sides of the equation by 5:

```plaintext
M = 55 ÷ 5
```

2. Calculate: Perform the division:

```plaintext
M = 11
```

Result: Mabel's height is 11 units (the specific units depend on the context—could be inches, centimeters, etc.).

Practical Applications of Translating Sentences into Equations

The ability to convert verbal statements into algebraic equations has numerous real-world applications, including:

- Financial calculations: Converting word problems about savings, loans, or investments.
- Physics problems: Modeling relationships involving speed, distance, and time.
- Business scenarios: Calculating profit, revenue, or costs based on descriptions.
- Everyday problem-solving: Estimating quantities based on provided conditions.

Examples of Similar Sentences and Their Equations

1. "The total cost is $50, which is the sum of $20 and three times Mabel's age."

- Variables: M (Mabel's age)
- Equation: 50 = 20 + 3M

2. "Twice the length of a rectangle is equal to 24 meters."

- Variable: L (length)
- Equation: 2L = 24

3. "A car travels 60 miles per hour. How far does it go in 5 hours?"

- Variable: D (distance)
- Equation: D = 60 × 5

Understanding how to construct these equations enables problem solvers to find solutions efficiently.

Additional Tips for Translating Sentences into Equations

- Look for keywords: Words like "of," "sum," "difference," "product," "quotient," "each," "per," "total," often indicate specific operations.
- Identify the known and unknown quantities: Assign variables to the unknowns.
- Break complex sentences into parts: Simplify multi-step problems into smaller segments.
- Check your equations: Make sure the algebraic expression accurately reflects the verbal statement.

Practice Problems for Better Understanding

1. Translate into an equation: "Seven times Mabel's height equals 49."

- Hint: Use variable M for height.
- Solution: $7M = 49$

2. Translate into an equation: "The sum of Mabel's age and 9 is 20."

- Solution: $M + 9 = 20$

3. Translate into an equation: "Double Mabel's height is less than 30."

- Solution: $2M < 30$

4. Translate into an equation: "Mabel's height divided by 3 equals 4."

- Solution: $M / 3 = 4$

Practicing with varied sentence structures enhances your ability to translate words into equations confidently.

Conclusion: Mastering the Art of Translation

Converting verbal statements into algebraic equations is a fundamental skill that bridges language and mathematics. In the case of the sentence "55 is the product of 5 and Mabel's height," translating it into the equation $55 = 5M$ enables straightforward problem-solving. Whether you're solving for unknowns, modeling real-life situations, or preparing for exams, mastering this process will significantly improve your mathematical fluency.

Remember the key steps: read carefully, assign variables, identify operations, and write the corresponding algebraic expression. With practice, you'll become adept at translating complex sentences into clear, solvable equations, opening doors to a deeper understanding of mathematics and its applications in everyday life.

Frequently Asked Questions

How do you translate the sentence '55 is the product of 5 and Mabel's height' into an algebraic equation?

You write it as 55 = 5 × M, where M represents Mabel's height.

What does the variable M represent in the equation 55 = 5 × M?

M represents Mabel's height.

How can I solve for M if 55 = 5 × M?

Divide both sides of the equation by 5 to get M = 55 ÷ 5, so M = 11.

Why is the equation 55 = 5 × M useful in understanding Mabel's height?

Because it relates her height directly to the known product, allowing you to find her height by solving for M.

Can the sentence '55 is the product of 5 and Mabel's height' be expressed as M = 55 ÷ 5?

Yes, after translating it to 55 = 5 × M and solving for M, you get M = 55 ÷ 5.

What steps are involved in converting the sentence into an equation and solving for M?

First, identify the key parts of the sentence to form the equation 55 = 5 × M, then divide both sides by 5 to solve for M, resulting in M = 11.

If the product of 5 and Mabel's height is 55, what is her height?

Her height is 11 units, calculated by dividing 55 by 5.

Additional Resources

Translate This Sentence Into An Equation. 55 Is The Product Of 5 And Mabel's Height. Use The Variable M

Understanding how to translate words into mathematical expressions is a fundamental skill in mathematics, bridging the gap between language and numerical representation. The sentence, "55 is the product of 5 and Mabel's height," encapsulates a common scenario where real-world quantities are expressed mathematically to facilitate calculations, problem-solving, and analytical reasoning. This article explores the process of converting such

sentences into algebraic equations, emphasizing the importance of clarity, precision, and context. We will dissect the sentence, examine the role of variables, develop the corresponding equations, and discuss practical applications and potential pitfalls in translation.

Deciphering the Sentence: A Step-by-Step Breakdown

Before delving into the algebraic translation, it is essential to understand the components of the sentence and what each part signifies.

1. Analyzing the Sentence Components

The sentence reads:
"55 is the product of 5 and Mabel's height."

- "55": A numerical value representing a specific quantity.
- "is": An equality, indicating that the two quantities on either side are equivalent.
- "the product of 5 and Mabel's height": A multiplication operation involving two factors:
- The number 5.
- Mabel's height, which is a variable quantity.

2. Identifying the Key Concepts

- The word "product" explicitly indicates multiplication.
- The phrase "of 5 and Mabel's height" specifies the factors involved in the multiplication.
- The entire sentence describes a relationship where the product of two quantities equals a known value (55).

3. Recognizing Variables and Constants

- The number 55 is a constant.
- The number 5 is also a constant.
- Mabel's height is a variable quantity because it can vary; hence, it is represented by a variable, typically denoted as M.

Choosing the Appropriate Variable: Why Use M?

In algebra, variables are symbols used to represent unknown or variable quantities. The choice of variable often depends on context, convention, or clarity.

1. The Role of the Variable M

- The problem explicitly instructs to use the variable M.
- M represents Mabel's height, a quantity that is not specified but is integral to the equation.

- Using M simplifies notation and makes the equation manageable.

2. Benefits of Using M

- Clarity: Using a single variable for Mabel's height makes the equation straightforward.
- Flexibility: Allows for solving for M if needed.
- Standard Practice: Variables like M, H, x, or y are commonly used to denote heights, unknowns, or quantities in mathematical problems.

Formulating the Mathematical Equation

Having analyzed the components and chosen the variable, the next step is to develop the algebraic expression that accurately reflects the sentence.

1. Expressing "the product of 5 and Mabel's height"

- The phrase "the product of 5 and Mabel's height" translates to $5 \times M$ or $5M$ in algebraic notation.

2. Setting the Equation

- The sentence states that 55 is the product of these two quantities.
- The phrase "is" indicates equality, so the equation reads:

$$
55 = 5M
$$

3. Final Equation

$$
\boxed{55 = 5M}
$$

This equation succinctly encapsulates the original sentence's meaning, establishing a relationship between the known quantity (55), the constant (5), and the variable (M).

Solving the Equation: Finding Mabel’s Height

Once translated into an algebraic equation, the next logical step is to solve for the variable M to find Mabel's height.

1. Isolating the Variable

- To solve for M, divide both sides of the equation by 5:

$$
\frac{55}{5} = M
$$

\]

- Simplify:

\[
11 = M
\]

2. Interpretation

- M = 11 indicates that Mabel's height is 11 units (the units depend on context, e.g., inches, centimeters, feet).

3. Verifying the Solution

- Substitute M = 11 back into the original expression:

\[
5 \times 11 = 55
\]

- Since the calculation holds true, the solution is verified.

Extending the Concept: Broader Applications and Variations

Translating sentences into equations is a versatile skill applicable across various fields, including physics, economics, engineering, and everyday problem-solving.

1. Variations in Sentence Structure

- Sentences may involve additional operations, such as addition, subtraction, division, or more complex expressions.
- For example: "Twice Mabel's height plus 10 equals 35."
Translated as: \(2M + 10 = 35 \).

2. Handling Multiple Variables

- If the sentence involves more than one unknown, multiple variables are introduced, leading to systems of equations.
- Example: "The sum of Mabel's height and her brother's height is 20."
Translated as: \(M + B = 20 \), where B is the brother's height.

3. Practical Applications

- Real-world measurements: Converting descriptions of lengths, weights, or quantities into equations for calculation.
- Business and finance: Translating profit, cost, or revenue descriptions into algebraic formulas.
- Science and engineering: Expressing relationships between variables such as speed, distance, and time.

Common Challenges and Pitfalls in Translating Sentences to Equations

While the process may seem straightforward, several pitfalls can hinder accurate translation.

1. Misidentifying the Operation

- Confusing "product" with other operations such as sum or difference.
- Ensuring "product" is correctly interpreted as multiplication.

2. Incorrect Variable Assignment

- Picking an inappropriate variable that conflicts with existing notation.
- Using inconsistent variables throughout the problem.

3. Misreading the Sentence

- Overlooking key words such as "is," "of," "plus," "minus," which indicate different operations.
- Failing to recognize relationships and constraints.

4. Overcomplicating or Oversimplifying

- Introducing unnecessary variables or complications.
- Oversimplifying to the point of losing the original meaning.

Conclusion: The Significance of Precise Translation

Translating sentences into algebraic equations is a critical skill that enhances problem-solving capabilities and deepens understanding of mathematical relationships. In the specific case examined—"55 is the product of 5 and Mabel's height," using the variable M—the process illustrates clarity and precision. The resulting equation, 55 = 5M, is not just a symbolic representation but a bridge connecting language and mathematics, allowing for calculation, analysis, and further exploration.

Mastering this skill enables students and professionals alike to interpret complex scenarios, formulate solutions systematically, and communicate quantitative ideas effectively. Whether dealing with simple relationships like the one discussed or tackling more intricate systems, the foundational principles remain consistent: understand the language, identify the components, choose appropriate variables, and translate accurately. As such, this process underscores the elegance and utility of algebra in making sense of the world around us.

In summary, transforming a word problem into an algebraic equation involves careful analysis of language, strategic variable selection, and precise mathematical translation. The example provided demonstrates a fundamental approach that underpins much of mathematical reasoning and problem-solving

across disciplines.

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