If G(x) = 4x-7 Then G(1) = ?

If G(x) = 4x - 7 Then G(1) = ?

Understanding the Function G(x) = 4x - 7

Introduction to Functions

A function is a mathematical relationship that assigns each input to exactly one output. In the notation G(x), G is the function name, and x is the variable or input. The expression following the equal sign defines how to compute the output based on the input x.

Analyzing the Given Function

The function in question is G(x) = 4x - 7. This is a linear function, meaning its graph is a straight line. The function involves multiplying the input x by 4 and then subtracting 7 from the result.

Key Components of the Function

- Coefficient of x (4): Indicates the slope of the line, showing how much G(x) changes for each unit increase in x.
- Constant term (-7): Represents the y-intercept, the point where the line crosses the y-axis when x = 0.

Calculating G(1): Step-by-Step Process

Substituting the Value of x

To find G(1), substitute x = 1 into the function:
$$ G(1) = 4(1) - 7 $$
which simplifies to:
$$ G(1) = 4 - 7 $$

Performing the Arithmetic

The calculation involves basic arithmetic:
- Multiply 4 by 1, which gives 4.

- Subtract 7 from 4, resulting in -3.

Result of the Calculation

Thus, the value of G(1) is:
$$ G(1) = -3 $$

Understanding the Significance of G(1) = -3

Interpretation in the Context of the Function

The value G(1) = -3 indicates that when the input x is 1, the output of the function is -3. In graph terms, the point (1, -3) lies on the line defined by G(x).

Graphical Representation

- The line crosses the y-axis at -7 (the y-intercept).
- When x increases by 1, G(x) increases by 4 (the slope).

Implications of the Result

This calculation exemplifies how linear functions behave and how specific inputs translate to outputs.

Broader Context and Applications of Such Functions

Linear Functions in Real Life

Linear functions like G(x) = 4x - 7 appear in numerous real-world scenarios, including:
- Calculating total cost based on the number of items purchased.
- Estimating distance traveled over time with constant speed.
- Modeling relationships where change is proportional and consistent.

Understanding the Slope and Intercept

- The slope (4) suggests a steady increase in the output as the input increases.
- The y-intercept (-7) indicates the starting point when x is zero.

Examples of Practical Usage

- Cost calculation: If each item costs $4 and there's a fixed fee of $7, then total cost for x items is G(x) = 4x - 7.
- Physics: Distance traveled with constant velocity over time can be modeled similarly.

Extending the Concept: Other Inputs and Outputs

Calculating G(0)

Substitute x = 0:
$$ G(0) = 4(0) - 7 = -7 $$
This confirms the y-intercept point at (0, -7).

Calculating G(2)

Substitute x = 2:
$$ G(2) = 4(2) - 7 = 8 - 7 = 1 $$
The point (2, 1) lies on the line.

General Pattern

For any input x, the output can be found using:
$$ G(x) = 4x - 7 $$
which demonstrates the linear relationship between input and output.

Understanding the Impact of Changing the Function

Adjusting the Coefficients

- Changing the coefficient of x affects the slope and the steepness of the line.
- Modifying the constant term shifts the line vertically.

Example: G(x) = 3x + 2

- Slope: 3 (less steep)
- Y-intercept: 2
- For x = 1:
$$ G(1) = 3(1) + 2 = 5 $$

Comparison with Original Function

- G(x) = 4x - 7 yields G(1) = -3.
- G(x) = 3x + 2 yields G(1) = 5.
This illustrates how changing parameters influences the output at specific points.

Summary and Conclusion

Recap of the Calculation

- Given the function G(x) = 4x - 7.
- To find G(1), substitute x = 1.
- Calculation: G(1) = 4(1) - 7 = -3.
- Therefore, G(1) = -3.

Significance of the Result

Understanding how to evaluate the function at specific points helps in graphing, interpreting, and applying linear functions across various disciplines.

Final Remarks

Mastering the process of substituting values into functions and performing basic arithmetic is fundamental in algebra. Recognizing the structure of linear functions enables students and practitioners to model real-world situations effectively, analyze relationships, and make informed predictions.

In essence, the value of G(1) in the function G(x) = 4x - 7 is -3, illustrating the straightforward yet powerful nature of linear functions and their applications.

Frequently Asked Questions

If G(x) = 4x - 7, what is G(1)?

G(1) = 4(1) - 7 = 4 - 7 = -3

How do you evaluate G(1) when G(x) = 4x - 7?

Substitute x = 1 into the function: G(1) = 4(1) - 7, which simplifies to -3.

What is the value of G(1) for the function G(x) = 4x - 7?

The value of G(1) is -3.

If G(x) = 4x - 7, what does G(1) represent?

G(1) is the output of the function when the input x is 1, which is -3.

Can you find G(1) for the function G(x) = 4x - 7?

Yes, G(1) = 4(1) - 7 = -3.

What is the process to compute G(1) given G(x) = 4x - 7?

Insert x = 1 into the function: G(1) = 4(1) - 7, then simplify to get -3.

Is G(1) equal to -3 for the function G(x) = 4x - 7?

Yes, G(1) equals -3.

How does the value of G(1) change if the function is G(x) = 4x - 7?

For x = 1, G(1) is fixed at -3; changing the function would alter this value.

What is the numerical result of G(1) in the given function?

The numerical result is -3.

If G(x) = 4x - 7, what is the output when x equals 1?

The output is -3.

Additional Resources

If G(x) = 4x - 7 Then G(1) = ?

In the realm of algebra and functions, one of the foundational concepts students and professionals alike encounter is the idea of a function—an expression that assigns a unique output to each input. A

common question posed early in algebra involves evaluating a specific function at a given point: for example, given a function G(x) = 4x - 7, what is the value of G(1)? While it may seem straightforward at first glance, understanding how to evaluate such functions is essential for grasping more complex mathematical ideas and real-world applications. This article explores the process of evaluating functions, the significance of the function G(x) = 4x - 7, and how such evaluations underpin many mathematical endeavors.

Understanding Functions: The Building Blocks of Mathematics

Before delving into the specific problem, it's essential to grasp what a function is and why it matters. In mathematics, a function is a rule or correspondence that assigns exactly one output to each input from a set called the domain. Think of it as a machine: you input a value, and the machine processes it, producing an output based on the rule defined.

Key properties of functions:

- Unique outputs: For each input, there is only one output.
- Defined rule: The function specifies how to generate the output from the input.
- Domain and codomain: The set of all possible inputs (domain) and outputs (codomain).

Functions are ubiquitous in science, engineering, economics, and everyday life. They model relationships such as the distance traveled over time, the cost of goods based on quantity, or the growth of populations.

The Specific Function: G(x) = 4x - 7

In our case, the function is defined explicitly as:

G(x) = 4x - 7

This is a linear function, characterized by its constant rate of change—in this case, 4. The structure indicates that to find the output G(x) for any input x, one must multiply x by 4 and then subtract 7.

Understanding the structure:

- The coefficient 4 indicates the slope, or how much G(x) changes when x increases by 1.
- The constant term -7 shifts the entire graph vertically downward by 7 units.

Graphically, G(x) is a straight line crossing the y-axis at the point where x=0: G(0) = -7.

Calculating G(1): Step-by-Step Approach

The question at hand is: If G(x) = 4x - 7, then what is G(1)?

This is an elementary evaluation problem, but executing it correctly involves understanding

substitution and arithmetic.

Step 1: Identify the input value

The input is x=1.

Step 2: Substitute x=1 into the function

Replace every occurrence of x with 1:

G(1) = 4 1 - 7

Step 3: Perform the multiplication

4 1 = 4

Step 4: Complete the calculation

G(1) = 4 - 7

Step 5: Simplify

4 - 7 = -3

Result: G(1) = -3

This straightforward substitution exemplifies a common process in algebra: plugging in a specific value and simplifying to find the output.

Why Is Evaluating Functions Important?

While the calculation above is simple, understanding how to evaluate functions is crucial for multiple reasons:

- Modeling real-world phenomena: Knowing how a quantity changes with respect to another, such as calculating the profit for a given sales volume.
- Solving equations: Many algebraic problems involve finding the input that yields a specific output.
- Graphing functions: Plotting the relationship between variables depends on evaluating the function at multiple points.
- Understanding transformations: Recognizing how modifications to the function, like shifting or stretching, affect its graph.

In applied fields, the ability to evaluate functions enables professionals to make predictions, optimize processes, and interpret data.

Broader Implications and Applications of Linear Functions

Linear functions like G(x) = 4x - 7 serve as fundamental models in various disciplines.

Economics: They model cost functions, where G(x) could represent total cost based on the number of units produced, with the slope indicating marginal cost.

Physics: Describing constant velocity motion, where G(x) could represent position over time, with 4 indicating speed.

Biology: Modeling population growth or decline over time with a constant rate.

Understanding how to manipulate and evaluate such functions allows practitioners to make informed decisions and develop more complex models.

Common Pitfalls and Tips for Evaluating Functions

While evaluating functions may seem straightforward, students and practitioners should be mindful of common mistakes:

- Misreading the input: Always ensure the correct value is substituted.
- Order of operations: Follow the PEMDAS (Parentheses, Exponents, Multiplication and Division, Addition and Subtraction) rules carefully.
- Sign errors: Pay attention to negative signs, especially when subtracting.
- Function notation confusion: Recognize that G(1) is "the function G evaluated at 1," not multiplication.

Tips to avoid errors:

- Write down each step clearly.
- Double-check substitutions.
- Use parentheses to clarify operations.
- Practice evaluating functions with different types of expressions.

Extending the Concept: From G(1) to General Evaluations

The process demonstrated for G(1) applies universally. For any value x = a, the evaluation involves:

G(a) = 4a - 7

This allows for quick computation once the value of a is known. Additionally, understanding this process paves the way to more advanced topics, such as:

- Function composition: Evaluating G(G(x)) or other nested functions.
- Inverse functions: Finding the input that yields a specific output.
- Graphing: Plotting G(x) based on various input points.

Such skills are foundational in higher mathematics, including calculus and linear algebra.

Conclusion: The Significance of Evaluating G(1)

In conclusion, the question "If G(x) = 4x - 7, then G(1) = ?" encapsulates a fundamental skill in mathematics: evaluating a function at a specific point. The process involves straightforward substitution and arithmetic, but its importance extends far beyond this simple example. Mastering this skill provides the groundwork for understanding complex relationships, modeling real-world scenarios, and solving a wide array of mathematical problems.

Final answer: G(1) = -3

By recognizing the importance of functions and practicing evaluation techniques, learners can build a strong mathematical foundation that supports advanced study and practical application across numerous fields.

If G X 4x 7 Then G 1

If G X 4x 7 Then G 1

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