If F(x) -3x + 4 And G(x) =2, Solve For The Value Of X Forwhich F(x)= G(x)is True.Y=f(x)g(x)3

If F(x) -3x + 4 And G(x) =2, Solve For The Value Of X Forwhich F(x)= G(x)is True.Y=f(x)g(x)3

Understanding how to solve algebraic equations involving functions is crucial in mathematics, especially when dealing with functions like F(x) and G(x). In this article, we will explore a comprehensive step-by-step process to find the value of x that satisfies the equation F(x) = G(x), given specific functions. Additionally, we will interpret the meaning of the expression Y = f(x)g(x)3, analyze its significance, and provide tips for solving similar problems efficiently. Whether you're a student preparing for exams or a math enthusiast, this guide will enhance your problem-solving skills and deepen your understanding of functions and equations.

Understanding the Given Functions and the Problem

Before diving into the solution, it is essential to clarify the given information and what the problem asks us to find.

Given Functions

- F(x) = -3x + 4
- G(x) = 2

Note: There appears to be a typo or formatting issue in the original problem statement, but based on standard algebraic conventions, we interpret it as:

- F(x) = -3x + 4
- G(x) = 2

and the goal is to find the value(s) of x for which F(x) = G(x).

Understanding the Objective

- Find the value(s) of x such that:

F(x) = G(x)

- Additionally, interpret or evaluate the expression:

Y = f(x)g(x)3

This might involve understanding the notation and how it relates to the functions F(x) and G(x).

Step-by-Step Solution: Finding x When F(x) = G(x)

Let's proceed systematically to solve for the value(s) of x.

Step 1: Set F(x) Equal to G(x)

Given:
- F(x) = -3x + 4
- G(x) = 2

Set these equal:
$$
-3x + 4 = 2
$$

Step 2: Solve the Equation for x

Subtract 4 from both sides:
$$
-3x + 4 - 4 = 2 - 4
$$
$$
-3x = -2
$$

Divide both sides by -3:
$$
x = \frac{-2}{-3} = \frac{2}{3}
$$

Result:

$$
x = \frac{2}{3}
$$

\]

This is the value of x where F(x) equals G(x).

Step 3: Verify the Solution

To ensure correctness, substitute x = 2/3 into both functions:

- F(2/3):

$$
F\left(\frac{2}{3}\right) = -3 \times \frac{2}{3} + 4 = -2 + 4 = 2
$$

- G(2/3):

$$
G\left(\frac{2}{3}\right) = 2
$$

Since both functions yield the same value (2) at x = 2/3, the solution is confirmed.

Interpreting and Calculating the Expression Y = f(x)g(x)3

The expression "Y = f(x)g(x)3" appears to be a notation indicating a product involving functions f(x) and g(x), possibly multiplied by 3, or perhaps an indication of cubing the product. Given the context and common mathematical notation, it likely refers to:

$$
Y = f(x) \times g(x) \times 3
$$

or perhaps:

$$
Y = [f(x) \times g(x)]^3
$$

Let's analyze both possibilities.

Possible Interpretations

1. Product multiplied by 3:

$$
Y = f(x) \times g(x) \times 3
$$

2. Cube of the product:

$$
Y = [f(x) \times g(x)]^3
$$

Given the wording, the most probable interpretation is the first: the product of two functions times 3.

Calculating Y Based on the Given Functions

Assuming the functions are:

- f(x) = F(x) = -3x + 4
- g(x) = G(x) = 2

then:

$$
Y = f(x) \times g(x) \times 3
$$

which simplifies to:

$$
Y = (-3x + 4) \times 2 \times 3
$$

Step 1: Express Y in terms of x

$$
Y = (-3x + 4) \times 2 \times 3
$$

Multiply constants:

$$
Y = (-3x + 4) \times 6
$$

Distribute:

$$
Y = -3x \times 6 + 4 \times 6 = -18x + 24
$$

Step 2: Find the value of Y at x = 2/3

Recall from earlier, x = 2/3.

Substitute into Y:

$$
Y = -18 \times \frac{2}{3} + 24
$$

Calculate:

$$
-18 \times \frac{2}{3} = -18 \times \frac{2}{3} = -12
$$

Then:

$$
Y = -12 + 24 = 12
$$

Therefore,

$$
Y = 12
$$

when x = 2/3.

Summary of Results and Final Insights

Key takeaways from this problem:

- The value of x that satisfies F(x) = G(x) is x = 2/3.
- Substituting x = 2/3 into the functions confirms the equality.
- The expression Y = f(x)g(x)3, interpreted as the product times 3, results in Y = -18x + 24.
- At x = 2/3, Y evaluates to 12.

Additional Tips for Solving Similar Problems

To improve your problem-solving skills in algebra and functions, consider these tips:

- Always verify your solutions by substituting back into original functions.
- Clarify notation: Ensure you understand whether expressions involve multiplication, addition, or exponents.
- Practice with different functions: Linear, quadratic, and exponential functions to build versatility.
- Use algebraic properties: Distribute, combine like terms, and isolate variables effectively.
- Understand domain restrictions: Be aware of values that may make functions undefined or invalid.

Conclusion

In this comprehensive guide, we've demonstrated how to solve for the value of x when F(x) equals G(x), given specific functions. The key steps involved setting the functions equal, solving the resulting linear equation, verifying the solution, and interpreting additional expressions involving these functions. Mastering such problems enhances your understanding of algebraic functions, their properties, and their applications in various mathematical contexts. Keep practicing with different types of functions and equations to strengthen your problem-solving skills and mathematical intuition.

Frequently Asked Questions

Given F(x) - 3x + 4 and G(x) = 2, how do you find the value of x when F(x) equals G(x)?

Set F(x) equal to G(x): -3x + 4 = 2. Solve for x: -3x = 2 - 4, so -3x = -2, and x = (-2)/(-3) = 2/3.

What is the solution for x when F(x) = G(x) given F(x) = -3x + 4 and G(x) = 2?

x = 2/3.

How do you verify that x = 2/3 satisfies F(x) = G(x)?

Substitute x = 2/3 into F(x): -3(2/3) + 4 = -2 + 4 = 2. Since G(x) = 2, they are equal, confirming the solution.

If F(x) = -3x + 4 and G(x) = 2, what is the value of y when y = F(x) G(x)^3?

First, find x = 2/3. Then, y = F(x) (G(x))^3 = 2 (2)^3 = 2 8 = 16.

How do you compute y = F(x) g(x)^3 for the found x value?

Calculate F(x) at x=2/3, which is 2, and G(x)^3, which is 8, then multiply: y = 2 8 = 16.

What is the significance of setting F(x) equal to G(x) in this problem?

It helps find the x-value where both functions have the same value, which is essential for solving the equation and related problems involving both functions.

Can the method of solving F(x) = G(x) be applied to other functions? If so, how?

Yes, set the two functions equal to each other and solve for x algebraically, regardless of the specific functions, to find points of intersection.

What are the key steps to solve for x when F(x) = G(x) with given functions?

1. Write the equation F(x) = G(x). 2. Substitute the given functions. 3. Solve the resulting algebraic equation for x. 4. Verify the solution if necessary.

If F(x) - 3x + 4 and G(x) = 2, what is the value of x when F(x) equals G(x)?

The value of x is 2/3.

Additional Resources

Understanding the Problem: Solving for X in the Equation F(x) - 3x + 4 And G(x) = 2, and Finding When F(x) = G(x) Is True

When diving into the world of algebra and functions, one common challenge is solving for the variable x when dealing with multiple functions and their relationships. In this case, we are presented with a scenario involving two functions, F(x) and G(x), and a set of conditions to find specific values of x. The problem states: "If F(x) - 3x + 4 And G(x) = 2, Solve For The Value Of X For which F(x) = G(x) is True. Y = f(x)g(x)3"—and understanding how to interpret and solve this requires a structured approach.

This guide will walk you through the problem step-by-step, clarifying the mathematical concepts, and providing a comprehensive analysis to find the solution efficiently.

Clarifying the Problem and Its Components

Before attempting to solve, it's crucial to interpret the problem statement properly. Let's break down the key elements:

- F(x) - 3x + 4: This suggests that the function F(x) might be expressed as F(x) = 3x - 4, but we need confirmation.
- G(x) = 2: G(x) is a constant function, always equal to 2.
- Solve for x when F(x) = G(x): Find the value(s) of x where the two functions are equal.
- Y = f(x)g(x)3: This seems to involve the product of functions f(x) and g(x), with some notation that may need clarification.

Given the structure, it appears there might be some typographical or formatting issues in the original problem statement. To clarify, let's make reasonable assumptions based on standard algebraic notation:

Assumptions and Interpretations

1. F(x) is given by: F(x) = 3x - 4
- Because "F(x) - 3x + 4" hints at a function involving these terms.
2. G(x) = 2: a constant function.
3. Find x such that: F(x) = G(x).
4. Y = f(x)g(x)3: Possibly meaning Y = [f(x) g(x)] 3, but since the functions are named F and G, perhaps it's a separate expression involving their product.

Step-by-Step Solution Guide

Step 1: Confirm the Functions

Based on the above, define the functions explicitly:

- F(x) = 3x - 4

- G(x) = 2

The goal is to find the value(s) of x for which:

F(x) = G(x)

Step 2: Set up the Equation

Since we're solving for x such that F(x) = G(x):

3x - 4 = 2

This is a straightforward linear equation.

Step 3: Solve for x

To solve:

3x - 4 = 2

Add 4 to both sides:

3x = 2 + 4

3x = 6

Divide both sides by 3:

x = 6 / 3

x = 2

Thus, the solution is x = 2.

Step 4: Verify the Solution

Substitute x = 2 back into F(x):

F(2) = 3(2) - 4 = 6 - 4 = 2

And G(2) = 2 (since G(x) = 2 for all x)

They are equal, confirming that x = 2 satisfies the condition.

Additional Exploration: Understanding the Expression Y = f(x)g(x)3

The statement "Y = f(x)g(x)3" suggests an expression involving the product of two functions multiplied by 3. If we interpret:

- f(x) and g(x) as functions, perhaps similar to F(x) and G(x).
- The expression f(x)g(x)3 as 3 f(x) g(x).

Suppose that:

- f(x) = F(x) = 3x - 4
- g(x) = G(x) = 2

Then:

Y = 3 (3x - 4) 2 = 3 2 (3x - 4) = 6 (3x - 4)

This simplifies to:

Y = 18x - 24

If the problem extends to find the value of Y at x = 2:

Y = 18(2) - 24 = 36 - 24 = 12

Summary of Key Steps and Concepts

1. Understanding Functions and Equations

- Recognize the forms of functions given or implied.
- Translate worded descriptions into algebraic expressions.

2. Setting Up Equations

- Equate functions where the problem requires finding x such that F(x) = G(x).

3. Solving Linear Equations

- Isolate x by performing inverse operations.
- Always verify solutions by plugging back into the original functions.

4. Interpreting Compound Expressions

- Understand products of functions and coefficients.
- Simplify step-by-step to avoid errors.

Additional Tips for Solving Similar Problems

- Clarify the problem statement. Look for possible typos or formatting issues to ensure correct interpretation.
- Identify the functions involved. Write them explicitly.
- Set the equations equal when required. This often simplifies the problem.
- Check solution validity. Always substitute back into original functions.
- Consider the domain. For linear functions like these, all real numbers are typically valid, but check for restrictions.

Final Thoughts

The process of solving for x in equations involving functions such as F(x) and G(x) hinges on clear understanding and careful algebra. In this specific case, with F(x) = 3x - 4 and G(x) = 2, the solution is straightforward: x = 2. The additional expression involving the product of functions emphasizes the importance of understanding how functions interact multiplicatively, which can be useful in various contexts like calculating areas, probabilities, or other applied mathematics problems.

By mastering these fundamental steps—defining functions, setting equations, solving systematically, and verifying—you can confidently approach a wide range of algebraic problems involving functions. Whether for academic purposes or practical applications, these skills form the backbone of mathematical problem-solving.

Remember: Always clarify the problem statement and assumptions before diving into calculations. This approach ensures accuracy and efficiency in finding solutions.

If F X 3x 4 And G X 2 Solve For The Value Of X Forwhich F X G X Is True Y F X G X 3

If F X 3x 4 And G X 2 Solve For The Value Of X Forwhich F X G X Is True Y F X G X 3

Related Articles

- Should You Multiply Audreys Savings For September By 4 Since There Are 4 Months? Explain
- Find The Values Of At Which There Are Horizontal Tangent Lines On The Graph Of R = 1 + Cos .
- Discuss How The Environment In Which A Child Is Raised Influences His Language Development

Back to Home