# What Value Of X Will Make This Equation True?2x + 1 = 3x + 6 F. X = 7 G. X = 1 H. X = 1 J. X = 5

**What Value Of X Will Make This Equation True?2x + 1 = 3x + 6 F. X = 7 G. X = 1 H. X = 1 J. X = 5**

Understanding how to solve linear equations such as 2x + 1 = 3x + 6 is fundamental in algebra. These equations are the building blocks for more complex mathematical concepts and are often used to model real-world problems. The question posed is: what value of x makes the equation true? The options provided are X = 7, X = 1, and X = 5, with some options repeated. In this article, we'll explore the step-by-step process to solve the equation, analyze each potential solution, and understand the reasoning behind the correct answer.

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## Understanding the Equation

### What Is a Linear Equation?

A linear equation in one variable is an algebraic expression where the variable (usually x) appears to the first power and is combined with constants using addition, subtraction, multiplication, or division. The general form looks like:

$$ ax + b = 0 $$

where a and b are constants, and $a \neq 0$.

In our specific case, the equation is:

$$ 2x + 1 = 3x + 6 $$

This is a linear equation because x appears to the first power and the equation can be manipulated algebraically to find the value of x that satisfies it.

### Goal of Solving the Equation

The primary goal is to isolate the variable x on one side of the equation to determine its value. Once x is isolated, the solution can be checked by substituting it back into the original equation to verify whether the equality holds.

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# Step-by-Step Solution Process

## Step 1: Write the original equation

$$ 2x + 1 = 3x + 6 $$

## Step 2: Rearrange the equation to gather like terms

Subtract 2x from both sides to get all x terms on one side:

$$ 2x + 1 - 2x = 3x + 6 - 2x $$

which simplifies to:

$$ 1 = x + 6 $$

## Step 3: Isolate x

Subtract 6 from both sides:

$$ 1 - 6 = x + 6 - 6 $$

resulting in:

$$ -5 = x $$

Thus, the solution is:

$$ x = -5 $$

## Step 4: Verify the solution

Substitute x = −5 into the original equation:

$$ 2(-5) + 1 = 3(-5) + 6 $$

Calculate each side:

Left side:

$$ 2 \times -5 + 1 = -10 + 1 = -9 $$

Right side:

$$ 3 \times -5 + 6 = -15 + 6 = -9 $$

Since both sides are equal (−9 = −9), the solution x = −5 satisfies the equation.

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# Analyzing the Provided Options

The options provided are:

- F. X = 7
- G. X = 1
- H. X = 1
- J. X = 5

From our solution, x = −5, which is not among the options. This indicates that the options listed are either incorrect or perhaps the question is designed to test understanding by providing distractors.

Key observations:

- The correct solution from algebraic manipulation is x = −5.
- None of the options match this, indicating a potential error in the options provided or the question's framing.

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# Understanding Why the Options Do Not Match the Solution

## Potential Reasons for Discrepancies

- Typographical Error: The options may be incorrect or misprinted.
- Different Equation: The options might pertain to a different or modified equation.
- Misinterpretation: The question might be testing recognition of common solutions like 1, 5, or 7 but the actual solution is different.

## Implication of the Discrepancy

When solving equations, it’s crucial to perform algebraic manipulations carefully. The discrepancy emphasizes the importance of verifying solutions by substitution, especially when options seem inconsistent.

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# Conclusion: What Value of X Makes the Equation

## True?

Based on the algebraic steps performed, the solution is:

$$\boxed{x = -5}$$

This value makes the original equation true, as verified by substitution.

However, since the options provided are X = 7, X = 1, and X = 5, none of which match the correct solution, it's evident that either the options are incorrect or the question is a hypothetical example.

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# Final Thoughts and Tips for Solving Linear Equations

## Key Tips:

1. Always write the original equation clearly before starting.
2. Use inverse operations to isolate the variable: addition/subtraction to move constants, multiplication/division to solve for the variable.
3. Keep equations balanced by performing the same operation on both sides.
4. Verify your solution by substituting back into the original equation.
5. Be cautious of extraneous solutions or options that do not satisfy the equation.

## Summary

- The algebraic solution to $2x + 1 = 3x + 6$ is $x = -5$.
- Verify solutions through substitution.
- Always double-check options if multiple-choice, but recognize that the provided options do not match the actual solution in this case.

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In conclusion, the value of x that makes the equation true is $x = -5$, which is not listed among the options provided. This highlights the importance of understanding the solving process and verifying solutions rather than solely relying on multiple-choice options.

# Frequently Asked Questions

## What value of X will satisfy the equation 2x + 1 = 3x + 6?

X = -5

## Is X = 7 the correct solution to the equation 2x + 1 = 3x + 6?

No, X = 7 does not satisfy the equation.

## Does X = 1 solve the equation 2x + 1 = 3x + 6?

No, X = 1 does not satisfy the equation.

## Is X = 5 the solution to 2x + 1 = 3x + 6?

No, X = 5 is not the solution.

## What is the correct value of X among the options F, G, H, J for the equation 2x + 1 = 3x + 6?

The correct value is X = -5, which is not listed among the options.

## How do you solve the equation 2x + 1 = 3x + 6 for X?

Subtract 2x from both sides: 1 = x + 6. Then subtract 6: 1 - 6 = x, so x = -5.

# Additional Resources

Algebraic Solutions: Unlocking the Value of X in the Equation 2x + 1 = 3x + 6

Understanding how to solve for an unknown variable in an equation is fundamental in algebra, serving as the cornerstone for more advanced mathematical concepts and real-world problem solving. Today, we delve into a classic linear equation: 2x + 1 = 3x + 6. Our goal is to determine what value of X makes this equation true, exploring the solution step-by-step, evaluating the provided options, and offering insights into the problem-solving process.

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# Deciphering the Equation: The Basics

Before jumping into calculations, it's crucial to understand the structure of the equation itself.

Equation Overview:

- Left Side: 2x + 1
- Right Side: 3x + 6

This is a linear equation, characterized by variables (x) raised to the first power and constants. The primary goal is to find a value of x that makes both sides equal.

Why is this important?

Solving such equations equips us with the skills to:

- Simplify complex expressions
- Model real-world scenarios involving relationships and proportions
- Develop critical thinking and analytical skills

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# Step-by-Step Solution Process

To find the value of x, we need to isolate the variable on one side of the equation. Let's proceed systematically.

## 1. Write down the original equation:

$$ 2x + 1 = 3x + 6 $$

## 2. Rearrange the equation to gather like terms:

Subtract 2x from both sides:

$$ 2x + 1 - 2x = 3x + 6 - 2x $$

which simplifies to:

$$ 1 = x + 6 $$

Note: This step helps to consolidate the variable on one side, simplifying the equation.

## 3. Isolate x:

Subtract 6 from both sides:

$$ 1 - 6 = x + 6 - 6 $$

which simplifies to:

$$ -5 = x $$

Result:

$$ x = -5 $$

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## Evaluating the Provided Options

Now, with the solution x = −5, let's compare this to the options provided:

- F. X = 7
- G. X = 1
- H. X = 1 (duplicate)
- J. X = 5

None of these options match our calculated value x = −5.

Implication:

- The options listed do not include the correct answer.
- It's possible that there was an error or misprint in the provided choices.
- Alternatively, the question might be a trick question to test understanding.

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## Deep Dive: Why the Options Don’t Match

Understanding why the options don't align with the solution offers valuable insight:

1. Common Mistakes in Solving Equations:

- Incorrect Algebraic Manipulation: For instance, adding or subtracting incorrectly.
- Sign Errors: Misplacing positive and negative signs.
- Misreading the Equation: Confusing coefficients or constants.

2. Verifying the Solution:

To ensure correctness, substitute x = −5 into the original equation:

$$ 2(-5) + 1 = 3(-5) + 6 $$

Calculations:

$$ -10 + 1 = -15 + 6 $$

$$ -9 = -9 $$

Conclusion:

The substitution confirms that x = −5 satisfies the original equation, reinforcing that this is the correct solution.

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## Alternative Scenarios: What if the Options Were Different?

Suppose the options had included x = −5. Here's how the analysis would proceed:

- Option A: X = −5 — Correct
- Option B: X = 0 — Testing:

$$2(0) + 1 = 3(0) + 6 \Rightarrow 1 = 6$$ (False)

- Option C: X = 2 — Testing:

$$2(2) + 1 = 3(2) + 6 \Rightarrow 4 + 1 = 6 + 6 \Rightarrow 5 = 12$$ (False)

- Option D: X = −1 — Testing:

$$2(-1) + 1 = 3(-1) + 6 \Rightarrow -2 + 1 = -3 + 6 \Rightarrow -1 = 3$$ (False)

This process illustrates the importance of substitution to verify solutions.

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## Implications and Real-World Applications

While solving for x in an algebraic context may seem abstract, these skills translate into practical applications:

- Finance: Calculating break-even points, interest rates, or investment growth.
- Engineering: Determining load distributions or system responses.
- Computer Science: Algorithm development involving variables and constraints.
- Daily Life: Planning budgets, recipes, or measuring tasks.

Understanding the solution process to equations like 2x + 1 = 3x + 6 enhances problem-solving agility across numerous domains.

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## Conclusion: The Key Takeaway

In analyzing the equation 2x + 1 = 3x + 6, we've determined that x = −5 is the unique solution. Despite the options provided (X = 7, 1, 1, 5) not matching this result, the process underscores critical algebraic techniques:

- Rearrangement of equations
- Combining like terms
- Verification via substitution

Final note: Always verify your solutions, especially when multiple-choice

options are inconsistent or appear to be incorrect. Mastery of these fundamental steps ensures a strong foundation for tackling increasingly complex mathematical challenges.

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Summary of Key Points:

- The correct solution to $2x + 1 = 3x + 6$ is $x = -5$.
- The provided options do not include this value, highlighting the importance of calculation verification.
- The solving process involves systematic steps: isolating the variable, simplifying, and substituting back.
- Skills gained from such exercises are widely applicable across academic, professional, and everyday contexts.

By mastering the art of solving linear equations, you develop a vital toolset that empowers clear reasoning and precise problem solving—essentials in any analytical toolkit.

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