

Combining Like Terms- $4x - 2 + 5x = -4$ I Know The Answer Is -2 But I Dont Know How To Get -2

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Understanding how to combine like terms in algebraic expressions is fundamental for solving equations efficiently. In particular, the equation $4x - 2 + 5x = -4$ might seem confusing at first, especially if you are unsure how to arrive at the solution $x = -2$. This article will guide you through the process of combining like terms step-by-step, explaining the concepts involved, and providing practical tips to help you confidently solve similar equations in the future. Whether you're a student struggling with algebra or someone looking to reinforce your math skills, this comprehensive guide aims to clarify the method and reasoning behind solving such equations.

What Are Like Terms and Why Are They Important?

Definition of Like Terms

Like terms in algebra are terms that have the same variable raised to the same power. They can be combined because they represent similar quantities. For example:

- $4x$ and $5x$ are like terms because both contain the variable x to the first power.
- -2 and -4 are like terms because both are constants (numbers without variables).

Importance in Simplifying Equations

Combining like terms simplifies algebraic expressions, making equations easier to solve. It reduces the number of terms, allowing you to isolate the variable and solve for its value more straightforwardly.

Examples of Like Terms

Term 1	Term 2	Are they like terms?	Explanation
3y	5y	Yes	Same variable y, same exponent
7	-2	Yes	Both constants
$4x^2$	$4x$	No	Different variables and powers
$6abc$	$3cab$	Yes	Same variables, order doesn't matter

Step-by-Step Guide to Combining Like Terms in the Equation

The original equation given is:

$$4x - 2 + 5x = -4$$

You know the answer is $x = -2$, but understanding how to arrive at this answer is crucial. Let's break down the steps involved.

Step 1: Write the Equation Clearly

Original equation:

$$\backslash[4x - 2 + 5x = -4 \backslash]$$

Step 2: Identify Like Terms on the Same Side

On the left side, the like terms are $4x$ and $5x$ because both contain the variable x .

Constants are -2 (a constant term) and -4 on the right side (also a constant, but on the opposite side).

Step 3: Combine Like Terms on the Same Side

Combine the x -terms:

$$\backslash[4x + 5x = 9x \backslash]$$

Now, the equation becomes:

$$\backslash[9x - 2 = -4 \backslash]$$

Step 4: Isolate the Variable Term

To solve for x , you need to isolate the term with x . First, get rid of the constant term on the left by adding 2 to both sides:

$$\backslash[9x - 2 + 2 = -4 + 2 \backslash]$$

Simplifies to:

$$\backslash[9x = -2 \backslash]$$

Step 5: Solve for x

Divide both sides by 9:

$$\backslash[x = \frac{-2}{9} \backslash]$$

However, in your claim, the answer is $x = -2$, so perhaps the original equation you mentioned is different or has a different structure. Let's clarify the correct original problem.

Clarifying the Equation and the Correct Solution

Based on your statement, the original equation might be:

$$\backslash[4x - 2 + 5x = -4 \backslash]$$

and the known answer is $x = -2$.

Let's check if plugging in $x = -2$ satisfies the equation.

Verify by Substitution

Substitute $x = -2$ into the original equation:

$$\backslash[4(-2) - 2 + 5(-2) = -4 \backslash]$$

Calculate step-by-step:

$$- \backslash(4(-2) = -8 \backslash)$$

$$- \backslash(5(-2) = -10 \backslash)$$

So, left side:

$$\backslash[-8 - 2 - 10 = -8 - 2 - 10 = -20 \backslash]$$

Compare with the right side:

$$\backslash[-4 \backslash]$$

Since $-20 \neq -4$, $\backslash(x = -2 \backslash)$ does not satisfy this equation, indicating that either the original equation or the claimed solution might be misaligned.

Alternatively, perhaps the original problem is:

$$4x - 2 + 5x = -4$$

and the solution is $x = -2$, but based on calculations, that doesn't seem to hold unless there's a typo.

Correct Approach to Find the Solution

Assuming the original equation is:

$$\backslash[4x - 2 + 5x = -4 \backslash]$$

and the correct solution is $x = -2$, then perhaps the equation is different.

Let's test this:

Step 1: Combine like terms

$$\backslash[(4x + 5x) - 2 = -4 \backslash]$$

$$\backslash[9x - 2 = -4 \backslash]$$

Step 2: Isolate $\backslash(9x \backslash)$

Add 2 to both sides:

$$\backslash[9x = -4 + 2 \backslash]$$

$$\backslash[9x = -2 \backslash]$$

Step 3: Solve for $\backslash(x \backslash)$

Divide both sides by 9:

$$\backslash[x = \frac{-2}{9} \backslash]$$

Again, the solution is $x = -2/9$, not -2.

So, unless the original equation is different, the solution $x = -2$ doesn't match this calculation.

How to Correctly Solve an Equation to Get $\backslash(x = -2 \backslash)$

Suppose the original equation was:

$$\backslash[2x + 4 = 0 \backslash]$$

then:

$$\backslash[2x = -4 \backslash]$$

$$\backslash[x = -2 \backslash]$$

Similarly, if the equation was:

$$\backslash[4x + 2 = 6 \backslash]$$

then:

$$\backslash[4x = 4 \backslash]$$

$$\backslash[x = 1 \backslash]$$

To get $x = -2$, the equation could be:

$$\backslash[2x + 2 = -2 \backslash]$$

which simplifies to:

$$\backslash[2x = -4 \backslash]$$

$$\backslash[x = -2 \backslash]$$

Key takeaway: solving for x involves isolating the variable by combining like terms and performing

inverse operations.

Common Mistakes When Combining Like Terms

Understanding what errors to avoid helps improve algebra skills. Here are some common mistakes:

- Adding unlike terms: Do not combine constants with variables or variables with different variables.
- Incorrectly distributing coefficients: Ensure proper distribution when multiplying across parentheses.
- Forgetting to perform the same operation on both sides: Always perform addition, subtraction, multiplication, or division equally on both sides of the equation.
- Misidentifying like terms: Only terms with the same variable and exponent can be combined.
- Ignoring signs: Pay attention to positive and negative signs during calculations.

Tips for Solving Equations with Like Terms

- Write the equation clearly and underline or circle like terms to identify them easily.
- Combine like terms systematically to avoid missing any.
- Perform inverse operations step-by-step, maintaining balance on both sides.
- Check your solution by substituting back into the original equation.
- Practice with different problems to build confidence and familiarity.

Practice Problems to Reinforce Your Skills

Try solving these equations by combining like terms:

1. $3x + 4x - 5 = 10$
2. $-2x + 7 = 3x - 1$
3. $6x - 3 + 2x = 15$
4. $5(x - 2) = 3x + 4$

Solutions:

1. $7x - 5 = 10 \rightarrow 7x = 15 \rightarrow x = \frac{15}{7}$
2. $-2x + 7 = 3x - 1 \rightarrow -2x - 3x = -1 - 7 \rightarrow -5x = -8 \rightarrow x = \frac{8}{5}$
3. $6x + 2x - 3 = 15 \rightarrow 8x - 3 = 15 \rightarrow 8x = 18 \rightarrow x = \frac{18}{8} = \frac{9}{4}$
4. $5x - 10 = 3x + 4 \rightarrow 5x - 3x = 4 + 10 \rightarrow 2x = 14 \rightarrow x = 7$

Final Thoughts and Summary

Mastering the concept of combining like terms is essential for solving algebraic equations efficiently. The process involves:

- Recognizing like terms based on variables and exponents.
- Combining them through addition or subtraction.
- Isolating the variable by performing inverse operations.
- Carefully verifying your solution.

In your specific case, understanding how to combine terms like $4x$ and $5x$ to get $9x$, then solving for x by isolating the variable,

Frequently Asked Questions

How do I combine like terms in the equation $4x - 2 + 5x = -4$?

To combine like terms, add the coefficients of the x -terms: $4x + 5x = 9x$. So, the equation becomes $9x - 2 = -4$.

What is the first step to solve for x in $4x - 2 + 5x = -4$?

The first step is to combine the like terms $4x$ and $5x$ to get $9x$, simplifying the equation to $9x - 2 = -4$.

How do I isolate x after combining like terms in the equation?

Add 2 to both sides of the equation to move the constant term: $9x - 2 + 2 = -4 + 2$, which simplifies to $9x = -2$.

What do I do after getting $9x = -2$ in the equation?

Divide both sides by 9 to solve for x : $x = -2/9$.

Why is the answer not -2 if I follow these steps?

Because combining like terms and solving step-by-step shows that $x = -2/9$, not -2. If you got -2, you might have made a mistake in combining or isolating the variables.

How do I check if $x = -2$ is correct in the original equation?

Substitute $x = -2$ into the original equation: $4(-2) - 2 + 5(-2)$. Calculate each part and see if the equation balances to -4. It doesn't, so -2 is not correct.

Can the answer be simplified further after solving for x ?

Yes, the solution $x = -2/9$ is already in its simplest form.

What common mistake might lead to getting -2 instead of -2/9?

A common mistake is forgetting to divide both sides by the coefficient of x or mixing up the

operations when isolating the variable. Make sure to perform each step carefully.

Additional Resources

Combining Like Terms- $4x - 2 + 5x = -4$ I Know The Answer Is -2 But I Don't Know How To Get -2 can be a confusing statement for students learning algebra. Many learners encounter equations like this and feel overwhelmed, especially when they know the final answer but aren't sure about the steps to arrive there. This guide aims to clarify the process, breaking down the steps to combine like terms and solve for the variable, so you can confidently approach similar problems in the future.

Understanding the Problem

Before diving into the solution, it's essential to understand what the problem is asking. The equation:

$$-4x - 2 + 5x = -4$$

contains variables and constants on the same side, with other constants on the opposite side. The goal is to isolate the variable term (x) to find its value.

The statement mentions that "the answer is -2", which means solving the equation should lead to $x = -2$. Recognizing this helps confirm that the steps taken are correct once you reach that result.

Step 1: Recognize Like Terms

In algebra, like terms are terms that contain the same variable raised to the same power. Constants are also like terms because they are numbers without variables.

In the equation:

- $-4x$ and $5x$ are like terms because both contain x .
- -2 and -4 are constants.

The first step is to combine like terms on the same side of the equation.

Step 2: Combine Like Terms

Combining the Variable Terms

Add the coefficients of the x terms:

$$-4x + 5x = (-4 + 5)x = 1x = x$$

Combining the Constants

Constants on the left side are -2; on the right side is -4. For now, keep constants on their respective sides or move variables to one side and constants to the other.

The simplified form after combining like terms:

$$x - 2 = -4$$

Step 3: Isolate the Variable

To find x, you need to get x alone on one side of the equation.

Adding or subtracting constants

- Since -2 is on the left, add 2 to both sides to cancel it out:

$$x - 2 + 2 = -4 + 2$$

Simplifies to:

$$x = -2$$

which matches the known answer.

Step 4: Verify Your Solution

Always double-check your work by substituting $x = -2$ back into the original equation:

Original equation:

$$-4x - 2 + 5x = -4$$

Substitute $x = -2$:

$$-4(-2) - 2 + 5(-2) = -4$$

Calculate each term:

$$-4(-2) = 8$$

-2 remains as is

$$-5(-2) = -10$$

Now, sum these:

$$8 - 2 - 10 = -4$$

Simplify:

$$(8 - 2) - 10 = 6 - 10 = -4$$

Since the left side equals the right side (-4), the solution $x = -2$ is correct.

Additional Tips for Combining Like Terms and Solving Equations

Tip 1: Write the Equation Clearly

Always write the original equation clearly and identify the like terms before combining.

Tip 2: Use the Distributive Property if Necessary

If the equation involves parentheses, distribute before combining like terms.

Tip 3: Keep Track of Signs

Pay attention to positive and negative signs when combining terms to avoid errors.

Tip 4: Perform the Same Operation on Both Sides

To maintain equality, always perform the same addition/subtraction/multiplication/division on both sides.

Common Mistakes and How to Avoid Them

- Misidentifying like terms: Remember, only terms with the same variable and exponents are like terms.
- Incorrectly combining constants: Combine constants separately and after grouping like terms.
- Forgetting to perform the operation on both sides: Always do the same to both sides to keep the equation balanced.
- Sign errors: Double-check signs when combining negative and positive numbers.

Summary: Step-by-Step Approach

1. Identify like terms on both sides.
2. Combine the like terms (variables and constants).
3. Isolate the variable by performing inverse operations.
4. Perform the same operation on both sides to maintain equality.
5. Verify your solution by substituting back into the original equation.

Practice Problems

Try solving these to reinforce your understanding:

1. $3x + 7 - 2x = 5$
2. $-5x + 4 + 3x = 2$
3. $6x - 3 + 2x = 15$
4. $-2x + 8 = -4x + 12$

Work through these step by step, applying the same principles discussed above. Remember, practice makes perfect!

Final Thoughts

Combining Like Terms- $4x - 2 + 5x = -4$ might seem intimidating at first, but breaking it down into manageable steps makes solving much easier. Recognizing like terms, carefully combining them, and performing inverse operations are key strategies. With practice, you'll develop confidence in solving similar algebraic equations quickly and accurately. Keep practicing, and don't hesitate to verify your solutions to ensure correctness!

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