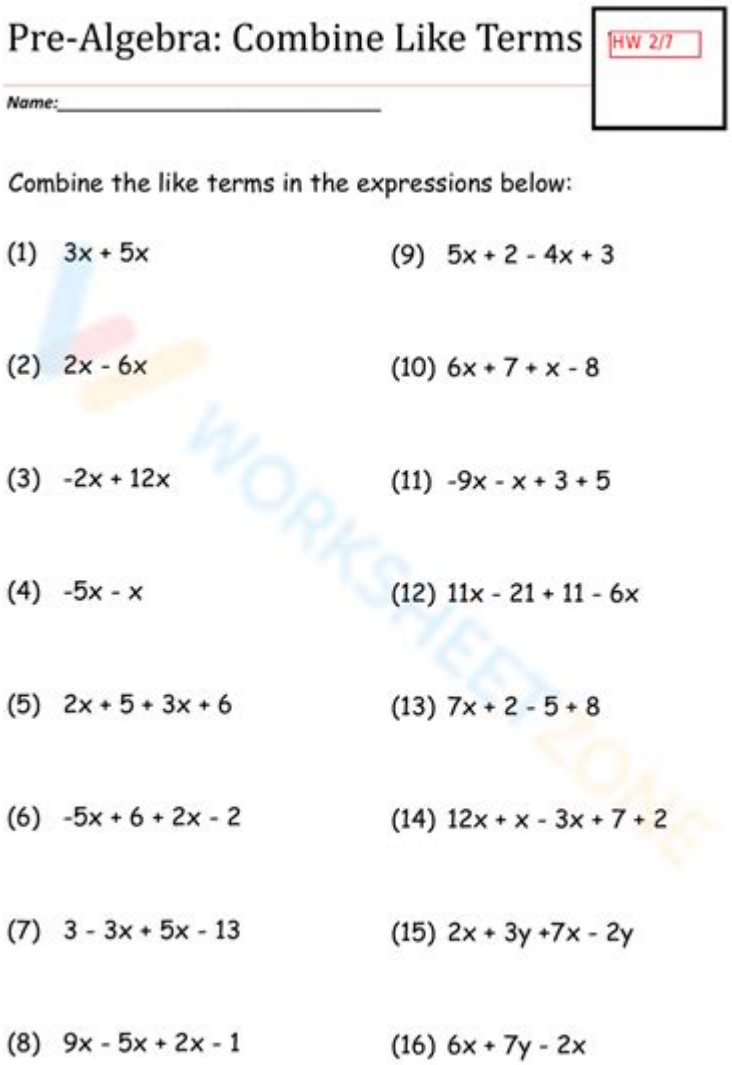
Pre Algebra Combining Like Terms



Pre-Algebra: Combine Like Terms HW 2/7

Name:_____

Combine the like terms in the expressions below:

(1) 3x + 5x

(2) 2x - 6x

(3) -2x + 12x

(4) -5x - x

(5) 2x + 5 + 3x + 6

(6) -5x + 6 + 2x - 2

(7) 3 - 3x + 5x - 13

(8) 9x - 5x + 2x - 1

(9) 5x + 2 - 4x + 3

(10) 6x + 7 + x - 8

(11) -9x - x + 3 + 5

(12) 11x - 21 + 11 - 6x

(13) 7x + 2 - 5 + 8

(14) 12x + x - 3x + 7 + 2

(15) 2x + 3y +7x - 2y

(16) 6x + 7y - 2x

Pre Algebra combining like terms is a fundamental concept in mathematics that serves as a building block for more advanced algebraic operations. Mastering this skill is crucial for students who want to progress in their understanding of algebra, as it lays the groundwork for solving equations and simplifying expressions. In this article, we will explore what combining like terms means, why it’s important, and how to effectively practice and master this essential pre-algebraic skill.

Understanding Like Terms

Before we dive into the process of combining like terms, it’s essential to understand what we mean by "like terms." Like terms are terms in an expression that have the same variable raised to the same power. Here’s a breakdown of the components:

Components of Like Terms

1. Coefficients: The numerical factor in front of the variable (e.g., in 3x, 3 is the coefficient).
2. Variables: The symbols representing unknown quantities (e.g., x, y, z).
3. Exponents: The power to which a variable is raised (e.g., in x^2, 2 is the exponent).

For example, in the expression 4x + 3x − 7 + 2y, the terms 4x and 3x are like terms because they both contain the variable x with an exponent of 1. However, the term 2y is not a like term with 4x or 3x because it contains a different variable (y).

Why is Combining Like Terms Important?

Combining like terms is crucial for several reasons:

1. Simplification: It allows for the simplification of expressions, making them easier to work with.
2. Solving Equations: Many algebraic problems require simplification to isolate variables and find solutions.
3. Foundation for Higher Math: Understanding this concept is essential for mastering more advanced topics such as polynomials, quadratic equations, and functions.

How to Combine Like Terms

Combining like terms involves a straightforward process. Here's a step-by-step guide:

Step 1: Identify Like Terms

Look through the expression and group the terms that are alike.

For example:
- In the expression 5x + 3y − 2x + 7y, identify the like terms:
- Like terms for x: 5x and −2x
- Like terms for y: 3y and 7y

Step 2: Combine the Coefficients

Add or subtract the coefficients of the like terms while keeping the variable part the same.

Continuing with our example:
- For x: 5x − 2x = (5 − 2)x = 3x
- For y: 3y + 7y = (3 + 7)y = 10y

Step 3: Rewrite the Expression

After combining the like terms, rewrite the expression with the new coefficients.

So, $5x + 3y - 2x + 7y$ simplifies to:
- $3x + 10y$

Examples of Combining Like Terms

Let's take a look at a few more examples to solidify our understanding.

Example 1: Simple Expression

Expression: $4a + 6b - 2a + 3b$

1. Identify like terms:
- Like terms for a: $4a$ and $-2a$
- Like terms for b: $6b$ and $3b$

2. Combine coefficients:
- $4a - 2a = 2a$
- $6b + 3b = 9b$

3. Rewrite the expression:
- The simplified expression is $2a + 9b$.

Example 2: Multi-variable Expression

Expression: $7x^2 + 3x - 2x^2 + 4x - 5$

1. Identify like terms:
- Like terms for x^2: $7x^2$ and $-2x^2$
- Like terms for x: $3x$ and $4x$
- The constant term: -5

2. Combine coefficients:
- $7x^2 - 2x^2 = 5x^2$
- $3x + 4x = 7x$

3. Rewrite the expression:
- The simplified expression is $5x^2 + 7x - 5$.

Practice Problems

Practicing combining like terms is vital for mastery. Here are some problems to try:

1. Simplify: $5m + 2n - 3m + 4n$

2. Simplify: $3x^2 + 4x - x^2 + 6$
3. Simplify: $2a + 3b - a + 5b - 4$

Answers:
1. $2m + 6n$
2. $2x^2 + 4x + 6$
3. $a + 8b - 4$

Common Mistakes to Avoid

When learning to combine like terms, students often make some common errors. Here are a few to watch out for:

1. Forgetting to Combine: Sometimes students may overlook like terms, particularly in longer expressions.
2. Incorrect Operations: Make sure to use the correct arithmetic (addition or subtraction) based on the signs of the coefficients.
3. Mixing Variables: Only combine like terms—do not attempt to combine terms with different variables.

Conclusion

In conclusion, **pre algebra combining like terms** is a vital skill that lays the foundation for future algebraic learning. By understanding what like terms are, practicing the combination process, and being aware of common mistakes, students can simplify expressions and solve equations more effectively. Mastery of this concept will not only aid in academic success but also provide a solid groundwork for more advanced mathematical topics. With practice and diligence, anyone can become proficient in combining like terms.

Frequently Asked Questions

What does it mean to combine like terms in pre-algebra?

Combining like terms involves simplifying an expression by adding or subtracting terms that have the same variable raised to the same power.

How do you identify like terms in an expression?

Like terms share the same variable(s) and exponent(s). For example, in the expression $3x + 5x$, both terms are like terms because they both contain the variable 'x' with the same exponent.

Can you combine constants when simplifying an expression?

Yes, constants are also considered like terms. For example, in the expression $4 + 7$, both terms are constants and can be combined to give 11.

What is the first step to combine like terms?

The first step is to group the like terms together in the expression, which often involves rearranging the terms.

How would you combine the terms 2x + 3x - 5?

You would combine the like terms 2x and 3x to get 5x, resulting in the simplified expression 5x - 5.

Is it possible to combine terms with different variables?

No, you cannot combine terms with different variables. For instance, 2x and 3y are not like terms and cannot be combined.

What will be the result of combining the expression 4a + 2b - 3a + b?

You would combine the like terms 4a and -3a to get a + 2b + b, which simplifies to a + 3b.

Why is combining like terms important in algebra?

Combining like terms is important because it simplifies expressions and equations, making it easier to solve problems and understand relationships between variables.

Can you give an example of combining like terms in a polynomial?

Sure! In the polynomial 5x^2 + 3x - 2 + 4x^2 - x + 7, you combine 5x^2 and 4x^2 to get 9x^2, and combine 3x and -x to get 2x, resulting in 9x^2 + 2x + 5.

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