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## How to workout like terms in algebra

Like terms are terms that contain the same variables raised to the same power. Only the numerical coefficients are different. In an expression, only like terms can be combined. We combine like terms to shorten and simplify algebraic expressions, so we can work with them more easily. To combine like terms, we add the coefficients and keep the variables the same. We can't combine unlike terms because that's like trying to add apples and oranges! Look at these 10 terms. Let's find all the like terms that can be combined. all these terms have  $x^2y$  all these terms have  $xy^2$  this is the only  $x^2yz$  term this is the only  $xy$  term all these terms have  $x^2y^2$  this is the only  $xy^2z$  term Be careful when combining! Terms like  $x^2yz$  and  $xy^2z$  look a lot alike, but they aren't and cannot be combined. Write the terms carefully when working out problems. Don't overlook terms that are alike! Terms obey the associative property of multiplication - that is,  $xy$  and  $yx$  are like terms, as are  $xy^2$  and  $y^2x$ . Before jumping to the like and unlike terms let's understand what an algebraic term is? Let's understand it by an example.  $5x + 3y^2 = 12$  is an algebraic equation. It consists of 3 terms i.e.  $5x$ ,  $3y^2$ , and 12. The first two terms consist of variables and 12 is a constant.  $5x + 3y^2$  is an algebraic expression. It has two terms  $5x$  and  $3y^2$ . In this article, we are going to learn the like and unlike algebraic terms. Like Terms These are the terms with the same variables and each of the variables having the same exponent power on them. One can combine the like terms to simplify the algebraic expressions so that the result of the expression can be calculated very easily. For example,  $3y + 5y$  is an algebraic expression with like terms. In order to simplify this algebraic expression, we can add the like terms. Thus, the simplification of the given expression is  $8y$ . In the same way, one can perform all the arithmetic operations on the like terms. Examples Here, each of the terms has the same variables and the same power.  $40xy^2$  &  $56xy^2$ : In the first example  $xy^2$  is the common coefficient for both terms. So, they fall into the category of like variables.  $30z^2$  &  $18z^2$ : Here  $z^2$  is the common coefficient for both terms. So, they fall into the category of like variables.  $45abc$  &  $29abc$ : Here  $abc$  is the common coefficient for both the terms. So, they fall into the category of like variables.  $18r^3$  &  $38r^3$ : Here  $r^3$  is the common coefficient for both terms. So, they fall into the category of like variables.  $2xy$  &  $8xy$ : Here  $xy$  is the common coefficient for both the terms. So, they fall into the category of like variables. Unlike Terms These are the terms with different variables and each of the variables having a different exponent power on them. For example,  $9x + 6y$  is an algebraic expression with unlike terms. Because it has two different variables  $x$  and  $y$ , and not raised to the same power. Examples  $40xy^2$  &  $56xy$ : Here, One has variables  $xy^2$  and the other has variables  $xy$ . Both have the same variables but with different exponents related to them. So, they fall into the category of unlike terms.  $30z^2$  &  $18z$ : Here, One has variables  $z^2$  and the other has variables  $z$ . Both have the same variables but with different exponents related to them. So, they fall into the category of unlike terms.  $18r^3$  &  $38r$ : Here, One has variables  $r^3$  and the other has variables  $r$ . Both have the same variables but with different exponents related to them. So, they fall into the category of unlike terms.  $2xy$  &  $8x$ : Here, One has variables  $xy$  and the other has variables  $x$ . Both have different variables related to them. So, they fall in the category of unlike terms. Below are a few examples to make these two terms more clear. Question 1. Identify like and unlike terms from the given terms:  $3x$ ,  $5xy$ ,  $18x^2y$ ,  $5x^3$ ,  $29xy$ ,  $50x^3$ ? Solution: Like terms:  $(5xy, 29xy)$ ,  $(5x^3, 50x^3)$  Unlike terms:  $3x$ ,  $18x^2y$  Question 2. Find like terms for  $67x^3$  from the given terms:  $3x$ ,  $5xy$ ,  $18x^2y$ ,  $5x^3$ ,  $29xy$ ,  $50x^3$ ? Solution: Like terms:  $5x^3$ ,  $50x^3$  Question 3. Find unlike terms for  $67x^3$  from the given terms:  $3x$ ,  $5xy$ ,  $18x^2y$ ,  $5x^3$ ,  $29xy$ ,  $50x^3$ ? Solution: Unlike terms:  $3x$ ,  $5xy$ ,  $18x^2y$ ,  $29xy$ . If you're seeing this message, it means we're having trouble loading external resources on our website. If you're behind a web filter, please make sure that the domains [\\*kastatic.org](http://www.kastatic.org) and [\\*kasandbox.org](http://www.kasandbox.org) are unblocked. Learning Objectives be able to combine like terms in an algebraic expression From our examination of terms in [link], we know that like terms are terms in which the variable parts are identical. Like terms is an appropriate name since terms with identical variable parts and different numerical coefficients represent different amounts of the same quantity. When we are dealing with quantities of the same type, we may combine them using addition and subtraction. Simplifying an Algebraic Expression An algebraic expression may be simplified by combining like terms. This concept is illustrated in the following examples.  $\text{\textit{8 records} + 5 records = 13 records.}$  Eight and 5 of the same type give 13 of that type. We have combined quantities of the same type.  $\text{\textit{8 records} + 5 records + 3 tapes = 13 records + 3 tapes.}$  Eight and 5 of the same type give 13 of that type. Thus, we have 13 of one type and 3 of another type. We have combined only quantities of the same type. Suppose we let the letter  $x$  represent "record." Then,  $8x + 5x = 13x$ . The terms  $8x$  and  $5x$  are like terms. So, 8 and 5 of the same type give 13 of that type. We have combined like terms. Suppose we let the letter  $x$  represent "record" and  $y$  represent "tape." Then,  $8x + 5x + 3y = 13x + 3y$  We have combined only the like terms. After observing the problems in these examples, we can suggest a method for simplifying an algebraic expression by combining like terms. Combining Like Terms Like terms may be combined by adding or subtracting their coefficients and affixing the result to the common variable. Sample Set A Simplify each expression by combining like terms.  $(2m + 6m - 4m)$ . All three terms are alike. Combine their coefficients and affix this result to  $m$ :  $2 + 6 - 4 = 4$ . Thus,  $(2m + 6m - 4m = 4m)$ . Sample Set A  $(5x + 2y - 9y)$ . The terms  $(2y)$  and  $(-9y)$  are like terms. Combine their coefficients:  $2 - 9 = -7$ . Thus,  $(5x + 2y - 9y = 3x - 7y)$ . Sample Set A  $(-3a + 2b - 5a + a + 6b)$ . The like terms are  $(\underbrace{-3a, -5a, a}_{\begin{matrix} \begin{matrix} \begin{matrix} \{-3 - 5 + 1 = -7\} \end{matrix} \\ \end{matrix} \\ \end{matrix}}\{c\} \begin{matrix} \begin{matrix} \{-7a\} \end{matrix} \\ \end{matrix} \end{matrix})$  and  $(\underbrace{2b, 6b}_{\begin{matrix} \begin{matrix} \begin{matrix} \{2 + 6 = 8\} \end{matrix} \\ \end{matrix} \\ \end{matrix}}\{c\} \begin{matrix} \begin{matrix} \{8b\} \end{matrix} \\ \end{matrix} \end{matrix})$ . Thus,  $(-3a + 2b - 5a + a + 6b = -7a + 8b)$ . Sample Set A  $(r - 2s + 3r - 4r - 5s)$ . The like terms are  $(r - 2s + 3r - 4r - 5s = 0)$ . Practice Set A Simplify each expression by combining like terms.  $(4x + 3x + 6x)$  Answer  $(13x)$  Practice Set A  $(5a + 6b + 6a - 2b)$  Answer  $(11a + 6b)$  Practice Set A  $(10m - 6n - 2n - m - n)$  Answer  $(9m - 7n)$  Practice Set A  $(16a + 6m + 2r - 3r - 18a + m - 7m)$  Answer  $(-2a - r)$  Practice Set A  $(5h - 8k + 2h - 7h + 3k + 5k)$  Answer 0 Simplify each expression by combining like terms. Exercise  $(\text{\textit{4a} + 7a})$  Answer  $(11a)$  Exercise  $(\text{\textit{3m} + 5m})$  Exercise  $(\text{\textit{6h} - 2h})$  Answer  $(4h)$  Exercise  $(\text{\textit{11k} - 8k})$  Exercise  $(\text{\textit{5m} + 3n - 2m})$  Answer  $(3m + 3n)$  Exercise  $(\text{\textit{7x} - 6x + 3y})$  Exercise  $(\text{\textit{14s} + 3s - 8r + 7r})$  Answer  $(17s - r)$  Exercise  $(\text{\textit{-5m} - 3n + 2m + 6n})$  Exercise  $(\text{\textit{7h} + 3a - 10k + 6a - 2h - 5k - 3k})$  Answer  $(5h + 9a - 18k)$  Exercise  $(\text{\textit{4x} - 8y - 3z + x - y - z - 3y - 2z})$  Exercise  $(\text{\textit{11w} + 3x - 6w - 5w + 8x - 11x})$  Answer 0 Exercise  $(\text{\textit{15r} - 6s + 2r + 8s - 6r - 7s - s - 2r})$  Exercise  $(\text{\textit{-7m} + 6m + -3m})$  Answer  $(16m)$  Exercise  $(\text{\textit{-2jx} + -8jx + 10jx})$  Exercise  $(\text{\textit{-4 + 1k} + (6 - 3)k + (12 - 4)h + (5 + 2)k})$  Answer  $(8h + 7k)$  Exercise  $(\text{\textit{-5 + 3a} - (2 + 5) b - (3 + 8)b})$  Exercise  $(\text{\textit{5\star + 2\Delta} + 3\Delta - 8\star})$  Answer  $(5\Delta - 3\star)$  Exercise  $(\text{\textit{9\text{#} + 10\text{#} - 11\text{#} - 12\text{#}}})$  Exercise  $(\text{\textit{16x} - 12y + 5x + 7 - 5x - 16 - 3y})$  Answer  $(16x - 15y - 9)$  Exercise  $(\text{\textit{-3y + 4z} - 11 - 3z - 2y + 5 - 4(8 - 3)})$  Exercises for Review Exercise  $(\text{\textit{21}})$  Convert  $(\text{\textit{24}})$   $(\text{\textit{11}})$  to a mixed number Answer  $(\text{\textit{2}})$   $(\text{\textit{2}})$   $(\text{\textit{11}})$  Exercise  $(\text{\textit{22}})$  Determine the missing numerator:  $(\text{\textit{3}})$   $(\text{\textit{8}}) = (\text{\textit{?}})$   $(\text{\textit{64}})$ . Exercise  $(\text{\textit{23}})$  Simplify  $(\text{\textit{5}})$   $(\text{\textit{6}}) - (\text{\textit{1}})$   $(\text{\textit{12}})$  Answer 7 Exercise  $(\text{\textit{24}})$  Convert  $(\text{\textit{5}})$   $(\text{\textit{16}})$  to a percent. Exercise  $(\text{\textit{25}})$  In the expression  $(\text{\textit{6k}})$ , how many  $(\text{\textit{k}})$ 's are there Answer 6



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