

The addition method is an algebraic method to solve a system of linear equations when solving one equation for a variable is not convenient. To begin, multiply one (or both) equations together, eliminating that variable. Solve for the remaining variable then substitute the result into one of the equations to determine the value of the other variable. Here is a worksheet to practice solving systems of linear equations with two variables by elimination. A third method, we add two terms with the same variable, but opposite coefficients, so that the sum is zero. Of course, not all systems are set up with the two terms of one variable having opposite coefficients. Often we must adjust one or both of the equations by multiplication so that one variable will be eliminated by addition. How To: Given a system of equations, solve using the addition method. Write both equations with x- and yvariables on the left side of the equal sign and constants on the right. Write one equation above the other, lining up corresponding variables in the bottom equations together, eliminating one variable. If not, use multiplication by a nonzero number so that one of the variables in the top equation has the opposite coefficient of the same variable. Solve the resulting equation for the remaining variable. Substitute that value into one of the original equations and solve for the second variable. Check the solution by substituting the values into the other equation. Solve the given system of equations by addition. [latex]x[/latex] in the second equation of [latex]x[/latex] in the second equation. Solve the given system of equations by addition. [latex]x[/latex] in the first equation, 1. We can add the two equations to eliminate [latex]x[/latex] without needing to multiply by a constant.[latex]y[/latex], we can solve the resulting equation for [latex]y[/latex]. $[latex] \end{array} {1} 3y = 2 \left[|x - x + y - 3 \right] \end{array} {1} 3y = 2 \left[|x - x + y - 3 \right] \end{array} {1} \end{array}$ $f^{3}\left(\frac{2}{3}\right) \end{array}[/latex] \end{array}[/latex]$ {3}=\hfill & \hfill & whether there may be a second solution because observing the graph confirms that the system has exactly one solution. Figure 5 Solve the given system of equations by the addition method.[latex]\begin{array}{/latex} Adding these equations as presented will not eliminate a variable. However, we see that the first equation has [latex]3x[/latex] in it and the second equation by [latex]-3,\text{}[/latex] the x-terms will add to zero.[latex]\begin{array}{|lll}\text{} x - 2y=11\hfill & \hfill & \\hfill 11y=44 \\ hfill y=4 \end{array}[/latex]For the last step, we substitute [latex]y=-4[/latex] into one of the original equations and solve for [latex]x[/latex].[latex]\begin{array}{c}3x+5y=-11\\ 3x+5\left(-4\right)=-11\\ 3x - 20=-11\\ 3x+5\left(-3\right)-2\left(-4\right)=3+8\hfill & \hfill & \ $\$ \hfill & \hfill \ \text{} =11\hfill \ \text{} \end{array}{c}2x - 7y=2\\ 3x+y=-20\end{array}{f\latex} \fill \ \text{} \text{True}\hfill \ One equation has [latex]2x[/latex] and the other has [latex]5x[/latex] and the second equation by [latex]-5[/latex] and the second equation by [latex]2[/latex]. $[latex] $$ for a rray {1} -5 \left(2x+3y\right) -5 \left(2x+3y\right) -5 \left(2x+3y\right) -5 \left(30\right) + 10x - 10y - 20y = 60 \right) $$ (30\right) -5 \left(30\right) -5 (30\right) -5 \left(30\right) -5 \left(30\right) -5 (30\right) -5 (30\right$ [/latex]Substitute [latex]y=-4[/latex] into the original first equation. [latex]\left(-4\right)=-16\\ 2x - 4\right)=16\\ 2x - 10\right]=16\\ 2x - 10\\ 2x $-10+40=30\$ hfill \text{ }30=30\end{array}[/latex] First clear each equation of fractions by multiplying both sides of the equation by the least common fractions by multiplying both sides of the equation by the least common fractions by multiplying both sides of the equation by the least common fractions by multiplying both sides of the equation by the least common fractions by multiplying both sides of the equation by the least common fractions by multiplying both sides of the equation by the least common fractions by multiplying both sides of the equation by the least common fractions by multiplying both sides of the equation by the least common fraction fraction fractions by multiplying both sides of the equation by the least common fraction fr $denominator.[latex] \end{array} {1} 6 \left(\frac{x}{3} + \frac{y}{6} \right) \end{array} {1} 6 \left(\frac{x}{3} + \frac{y}{6} \right) \end{array} {1} -1 \left(\frac{x}{3} + \frac{y}{6} \right) \end{$ \\hfill 2y=14 \\hfill y=7 \end{array}[/latex]Substitute [latex]y=7[/latex] into the first equation.[latex]\begin{array} y\right)=-1\left(4\right)\hfill \\ \text{ }-2x+y=-4\hfill \end{array}[/latex]Add the two equations to eliminate the x-variable and solve the resulting equation.[latex]\begin{array}\\hfill 2x+y=18 \\ \hfill 2x+y=4 \\ \text{ 11{2}\hfill \\ \text{ }2x+\left(7\right)=18\hfill \\ \text{ }2x=11\hfill \\ \text{ }2x=11\hfill \\ \text{ }2}-\frac{11}{2}\hfill \\ \text{ }2}-\frac{11}{4}=1\\ \frac{11}{4}-\frac{11}{4}-\frac{11}{4}=1\\ \frac{11}{4}=1\\ \frac{11}{4}=1\\ \frac{11}{4}-\frac{11}{4}=1\\ \frac{11}{4}=1\\ \frac{11 $\{4\}=1\}$ array $\{[\lambda]$ Solve the system of equations by addition. [latex]\begin{array}{c}2x+3y=8\\ 3x+5y=10\} (latex] Solution CC licensed content, Specific attribution A third method, we add two terms with the same variable, but opposite coefficients, so that the sum is zero. Of course, not all systems are set up with the two terms of one variable having opposite coefficients. Often we must adjust one or both of the equations by multiplication so that one variable will be eliminated by addition. How To: Given a system of equations, solve using the addition method. Write both equations with x and y-variables on the left side of the equal sign and constants on the right. Write one equation above the other, lining up corresponding variables. If one of the variables in the top equation has the opposite coefficient of the same variable in the bottom equation, add the equations together, eliminating one variable. If not, use multiplication by a nonzero number so that one of the variables in the top equation has the opposite coefficient of the same variable. Solve the resulting equation for the remaining variable. Substitute that value into one of the variable in the bottom equation has the opposite coefficient of the same variable. Solve the resulting equation has the opposite coefficient of the same variable. Solve the resulting equation has the opposite coefficient of the same variable. Solve the resulting equation has the opposite coefficient of the same variable. Solve the resulting equation has the opposite coefficient of the same variable. Solve the resulting equation has the opposite coefficient of the same variable. Solve the resulting equation has the opposite coefficient of the same variable. values into the other equation. Solve the given system of equations by addition. [latex]x[/latex] in the second equation, 1, is the opposite of the coefficient of [latex]x[/latex] in the first equation, 1. We can add the two equations to eliminate [latex]x[/latex] without needing to multiply by a constant.[latex]y[/latex].[latex]y[/latex].[latex]y[/latex].[latex]y[/latex $\end{array}[/latex]$ The solution to this system is $\end{array}[/latex]$ The solution in the first equation. $\end{array}[/latex]$ The solution to this system is $\end{array}[/latex]$ The solution in the first equation. [latex]\end{array}[/latex]The solution to this system is $\end{array}[/latex]$ The solution in the first equation. [latex]\end{array}[/latex]The solution to this system is $\end{array}[/latex]$ The solution to this system is $\end{array}[/latex]$ The solution to this system is $\end{array}[/latex]$ The solution in the first equation. [latex]\end{array}[/latex]The solution in the first equation. [latex]\end{array}[/latex]The solution in the first equation. [latex]\end{array}[/latex]The solution in the first equation. [latex]\end{array}[/latex][/late \hfill & \hfill \\ \text{ }-\frac{3}{3}=\hfill & \hfill \\ \text{ }-1=-1\hfill & \hfill \\ \text{ }-1=-1\hfill \\ second solution because observing the graph confirms that the system has exactly one solution. Figure 5 Solve the given system of equations by the addition method. [latex] however, we see that the first equation has [latex]3x[/latex] in it and the second equation has [latex]x[/latex]. So if we multiply the second equation by [latex]-3,\text{}[/latex] the x-terms will add to zero.[latex]\begin{array}{\lill}\text{} x - 2y=11\hfill & \hfill & \hfil \ \hfill 11y=44 \\ hfill y=4 \end{array}[/latex]For the last step, we substitute [latex]y=-4[/latex] into one of the original equations and solve for $[latex]x[/latex].[latex]\cdot x - 2y = 11\h x + 5\left[-(3x + 5y = -11\ 3x + 5\left[-(4 + 2y) + (3x + 5y = -11\ 3x + 5\left[-(4 + 2y) + (3x + 5y = -11\ 3x + 5\left[-(4 + 2y) + (3x + 5y = -11\ 3x + 5\left[-(4 + 2y) + (3x + 5y = -11\ 3x + 5\left[-(4 + 2y) + (3x + 5y = -11\ 3x + 5\left[-(4 + 2y) + (3x + 5y = -11\ 3x + 5\left[-(4 + 2y) + (3x + 5y = -11\ 3x + 5\left[-(4 + 2y) + (3x + 5y = -11\ 3x + 5\left[-(4 + 2y) + (3x + 5y = -11\ 3x + 5\left[-(4 + 2y) + (3x + 5y = -11\ 3x + 5\left[-(4 + 2y) + (3x + 5y = -11\ 3x + 5\left[-(4 + 2y) + (3x + 5y = -11\ 3x + 5\right]\right]\right] \right]$ & \hfill \\ \text{} =11\hfill \& \hfill \\ \text{True}\hfill \end{array}{c}2x - 7y=2\\ 3x+y=-20\end{array}{c}2x - 7y=2\\ 3x+y=-20\end{array}{c}2x - 7y=2\\ 5x - 10y=30\end{array}{[/latex]}One equation has [latex]2x[/latex] and the other has [latex]2x[/latex] and the other has [latex]2x[/latex]. The least common multiply both equation by [latex]-5[/latex] and the second equation by [latex]2[/latex]. The least common multiply both equations by a constant in order to eliminate one variable. Lets eliminate [latex]4[/latex] by multiplying the first equation by [latex]-5[/latex] and the second equation by [latex]2[/latex]. $-5\left(2x+3y\right)-5\left(2x+3y$ [latex]y=-4[/latex] into the original first equation.[latex]\begin{array}{c}x+3\left(-4\right)=30\\ \hfill \text{} \forall x=-4\\ x=-2\end{array}{r}\hfill \text{} \forall x=-2\end{array}{r}\hfill \f $30=30 \in {array}[/latex]Figure 7 Solve the given system of equations in two variables by addition.[latex] \in {array}[/latex]First clear each equation of fractions by multiplying both sides of the equation by the least common denominator.$ $[latex] \end{array} {1} \end$ y\right)=-1\left(4\right)\hfill \\ \text{}-2x+y=-4\hfill \end{array}[/latex]Add the two equations to eliminate the x-variable and solve the resulting equation.[latex]\begin{array}\ \hfill 2x+y=18 \\ \hfill 2x+y=4 \\ \text{} $\$ \\ \hfill 2y=14 \\ \hfill y=7 \end{array}[/latex]Substitute [latex]y=7[/latex] into the first equation.[latex]\begin{array} $\{1\}2x+\left(7\right)=18\right)$ \\frac{\frac{11}{2}}\frac{11}{2}-\frac{11}{2}\frac{11}{2}-\frac $\{4\}=1\end\{array\}[/latex]\script{Solve the system of equations by addition.[latex]\setminus equations By Addition More Algebra Lessons The following steps show how to solve a System of Equations using the Addition or Elimination$ Method. Scroll down the page for examples and solutions. In some word problems, we may need to translate the sentences into more than one equation. If we have n unknown variables then we would need at least n equations to solve the variable. There are two main methods to use when you need to solve more than one equation: Substitution Method. In the Addition Method. In the Addition Method, the two equations are added together to eliminate one of the variables. We try to get the coefficients of one of the variables to be opposites so that addition will eliminate it. Lets look at some example the coefficients of y are already opposites (+3 and 3). Just add the two equations to eliminate y. Step 2: Isolate variable x 6x = 12Step 3: To get the value of y you need to use the substitution method. Substitute x = 2 into equation 1. 2(2) + 3y = 24 + 3y = 2 Example 2: 2x + 3y = 2 Example 3: 2x +(equation 1)3x 4y = 10 (equation 2)Solution: Step 1: In this example none of the coefficients are opposites. We need to multiply each term of equation 2 by 3 9x 12y = 30Step 2: Add the two equations to eliminate y. Step 3: Isolate variable x 17x = 34Step 4: To get the value of y you need to use the substitution method. Substitute x = 2 into equation 1.2(2) + 3y = 14 + 3y = 15tep 5: Isolate variable y 3y = 3y = 15tep 5: Isolate variable y 3y = 3y = 15tep 5: Isolate variable x 17x = 34Step 4: To get the value of y you need to use the substitution method. Substitute x = 2 into equation 1.2(2) + 3y = 14 + 3y = 15tep 5: Isolate variable y 3y = 3y = 15tep 5: Isolate var variables. Step 2: Determine which variable to eliminated.) Step 4: Solve the resulting equation. Step 5: Substitute this result into either of the original equations. Step 6: Solve for the variable to find the original equation. Step 7: Check the solution in both originals equations. Examples: Solve the system of equations using the Addition (Elimination) Method 3x - 2y = -125x - 8y = 8 Solve the system of equations using the Addition (Elimination) Method 3x - 2y = -125x - 8y = 8 Solve the system of equations using the Addition (Elimination) Method 3x - 2y = -125x - 8y = 8 Solve the system of equations using the Addition (Elimination) Method 3x - 2y = -125x - 8y = 8 Solve the system of equations using the Addition (Elimination) Method 3x - 2y = -125x - 8y = 8 Solve the system of equations using the Addition (Elimination) Method 3x - 2y = -125x - 8y = 8 Solve the system of equations using the Addition (Elimination) Method 3x - 2y = -125x - 8y = 8 Solve the system of equations using the Addition (Elimination) Method 3x - 2y = -125x - 8y = 8 Solve the system of equations using the Addition (Elimination) Method 3x - 2y = -125x - 8y = 8 Solve the system of equations using the Addition (Elimination) Method 3x - 2y = -125x - 8y = 8 Solve the system of equations using the Addition (Elimination) Method 3x - 2y = -125x - 8y = 8 Solve the system of equations using the Addition (Elimination) Method 3x - 2y = -125x - 8y = 8 Solve the system of equations using the Addition (Elimination) Method 3x - 2y = -125x - 8y = 8 Solve the system of equations using the Addition (Elimination) Method 3x - 2y = -125x - 8y = 8 Solve the system of equations using the Addition (Elimination) Method 3x - 2y = -125x - 8y = 8 Solve the system of equations using the Addition (Elimination) Method 3x - 2y = -125x - 8y = 8 Solve the system of equations using the Addition (Elimination) Method 3x - 2y = -125x - 8y = 8 Solve the system of equations using the Addition (Elimination) Method 3x - 2y = -125x - 8y = 8 Solve the system of equations using the Addition (Elimination) Method 3x - 2y = -125x - 8y = 8 Solve the system of equations using the Addition (Elimination) Method 3x - 2y = -125x - 8y = 8equations using the elimination (addition) methodThis example requires multiplying one equation by a constant. 3x + y = -107x + 5y = -18Show Video LessonSystem of Equations Using Elimination (Infinite Solutions) 2x - 5y = 42x = 5y + 4Show Video LessonSystem of Equations Using Elimination (Infinite Solutions) 2x - 5y = 42x = 5y + 4Show Video LessonSystem of Equations Using Elimination (Infinite Solutions) 2x - 5y = 42x = 5y + 4Show Video LessonSystem of Equations Using Elimination (Infinite Solutions) 2x - 5y = 42x = 5y + 4Show Video LessonSystem of Equations Using Elimination (Infinite Solutions) 2x - 5y = 42x = 5y + 4Show Video LessonSystem of Equations Using Elimination (Infinite Solutions) 2x - 5y = 42x = 5y + 4Show Video LessonSystem of Equations Using Elimination (Infinite Solutions) 2x - 5y = 42x = 5y + 4Show Video LessonSystem of Equations Using Elimination (Infinite Solutions) 2x - 5y = 42x = 5y + 4Show Video LessonSystem of Equations Using Elimination (Infinite Solutions) 2x - 5y = 42x = 5y + 4Show Video LessonSystem of Equations Using Elimination (Infinite Solutions) 2x - 5y = 42x = 5y + 4Show Video LessonSystem of Equations Using Elimination (Infinite Solutions) 2x - 5y = 42x = 5y + 4Show Video LessonSystem of Equations (Infinite Solutions) 2x - 5y = 42x = 5y + 4Show Video LessonSystem of Equations (Infinite Solutions) 2x - 5y = 42x = 5y + 4Show Video LessonSystem of Equations (Infinite Solutions) 2x - 5y = 42x = 5y + 4Show Video LessonSystem of Equations (Infinite Solutions) 2x - 5y = 42x = 5y + 4Show Video LessonSystem of Equations (Infinite Solutions) 2x - 5y = 42x = 5y + 4Show Video LessonSystem of Equations (Infinite Solutions) 2x - 5y = 42x = 5y + 42x = 5yLesson This tool will help you check your steps and answers when solving two equations in two variables. Try out our new and fun Fraction Concoctions following a recipe. There are four levels of difficulty: Easy, medium, hard and insane. Practice the basicsof fraction addition and subtraction or challenge yourself with the insane level. We welcome your feedback, comments and questions about this site or page. Please submit your feedback or enquiries via our Feedback page.

Solve the system by the addition method. = =. Solve system by addition method. Solve each system by addition. Solve each system of equations by the addition method.