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Solving 2-step Equation worksheets: Examples, solutions, videos, and worksheets to help Grade 6 and Grade 7 students learn how to solve two-step equations (with fractions)How to solve two-step equations (with fractions)?There are three sets of solving two-step equations (with fractions) worksheets.Solve 2-step equations (fractional coefficients).Solve 2-step equations (fractional constants).Solve 2-step equations (fractional coefficients & constants).These are the steps to solve two-step equations:Determine the operations: Look at the equation and identify the operations being performed on the variable. It could involve addition, subtraction, multiplication, or division.Undo addition or subtraction: Perform the inverse operation of addition or subtraction to isolate the variable term. If theres addition, subtract the constant term from both sides of the equation. If theres subtraction, add the constant term to both sides.Undo multiplication or division: Perform the inverse operation of multiplication or division to isolate the variable. If theres multiplication, divide both sides of the equation by the coefficient of the variable. If theres division, multiply both sides by the reciprocal of the coefficient.Simplify and solve.Check your solution: After solving the equation, substitute the value back into the original equation to verify if it satisfies the equation. If it does, then you have found the correct solution. If not, review your steps and check for any errors.Simplify and solve: Simplify both sides of the equation by performing any necessary arithmetic operations. Finally, determine the value of the variable by solving the simplified equation.Example: Solve the equation 3/4 x + 5 = -16.Determine the operations: The operations involved are addition and multiplication.Undo addition: To isolate the variable term, we need to undo the addition. Subtract 5 from both sides of the equation:3/4 x + 5 - 5 = -16 - 53/4 x = -21Undo multiplication: To further isolate the variable, we need to undo the multiplication. Divide both sides of the equation by 3/4 or multiply by the reciprocal which is 4/3:3/4 x 4/3 = -21 4/3x = -28Simplify and solve: The equation is now simplified to x = -28.Check your solution by substituting it back into the original equation to ensure it satisfies the equality.Its important to remember that whatever operation you perform on one side of the equation, you must also perform on the other side to maintain equality. For example,Clearing Fractions or Eliminating DenominatorsYou can also solve equations with fractions by first clearing the fractions or eliminating the denominators. You can eliminate the fractions from the equation by multiplying both sides of the equation by a common denominator.Determine the least common denominator (LCD) of the fractions.Multiply both sides of the equation by the LCD.Now that you have eliminated the fractions, solve the equation like you would for any linear equation.Have a look at this video if you need to review how to solve 2-step equations with fractions using both methods. Solve a Two-Step Equation with FractionsClick on the following worksheet to get a printable pdf document.Scroll down the page for more Two-Step Equations Worksheets.More Two-Step Equation WorksheetsPrintable(Answers on the second page.)2-Step Equations Worksheet #1 (fractional coefficients)2-Step Equations Worksheet #2 (fractional constants)2-Step Equations Worksheet #3 (fractional coefficients & constants)Online or Generated2-Step EquationsSolving 2-Step Equations Solve Two-Step EquationsSolve 2-step EquationsMore Printable Worksheets Try out our new and fun Fraction Concoction Game.Add and subtract fractions to make exciting 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. A worksheet where you are given a set of equations to solve. The equations only need two 'steps' to solve and only involve fractions. Here we will learn about equations with fractions, including solving equations with fractions where the unknown is the denominator of a fraction. There are also equations with fractions worksheets based on Edexcel, AQA and OCR exam questions, along with further guidance on where to go next if youre still stuck. Equations with fractions involve solving equations where the unknown variable is part of the numerator and/or the denominator of the fraction. To solve equations with fractions we need to work out what the value of the unknown variable. We solve equations by using the balancing method by applying the inverse operation to both sides of the equation. The inverse operation of addition is subtraction. The inverse operation of subtraction is addition. The inverse operation of multiplication is division. The inverse operation of division is multiplication. For example, In order to solve equations with fraction: Identify the operations that are being applied to the unknown variable. Apply the inverse operations, one at a time, to both sides of the equation. Write the final answer, checking that it is correct. Get your free Equations with fractions worksheet of 20+ questions and answers. Includes reasoning and applied questions. DOWNLOAD FREE x Get your free Equations with fractions worksheet of 20+ questions and answers. Includes reasoning and applied questions. DOWNLOAD FREE Solve: Identify the operations that are being applied to the unknown variable. The unknown variable is x. Looking at the left hand side of the equation, thex is divided by 5 (the denominator of the fraction). 2Apply the inverse operations, one at a time, to both sides of the equation. The inverse of dividing by 5 is multiplying by 5. We need to multiply both sides of the equation by 5. 3Write the final answer, checking that it is correct. The final answer is: We can check the answer by substituting the answer back into the original equation. \[\frac{20}{5}=20\div5=4\] Solve: Identify the operations that are being applied to the unknown variable. The unknown variable is x. Looking at the left hand side of the equation, x is divided by 3 (the denominator of the fraction). Apply the inverse operations, one at a time, to both sides of the equation. The inverse of dividing by 3 is multiplying by 3. We need to multiply both sides of the equation by 3. Write the final answer, checking that it is correct. The final answer is: We can check the answer by substituting the answer back into the original equation. \[\frac{24}{3}=24\div3=8 \] Solve: Identify the operations that are being applied to the unknown variable. The unknown variable is x. Looking at the left hand side of the equation, 1 is added to x and then divided by 2 (the denominator of the fraction). Apply the inverse operations, one at a time, to both sides of the equation. We need to do the inverse operations in the reverse order. First we need to multiply both sides of the equation by 2. Then we need to subtract 1 from both sides. Write the final answer, checking that it is correct. The final answer is: We can check the answer by substituting the answer back into the original equation. \[\frac{13+1}{2}=\frac{14}{2}=14\div2=7\] Solve: Identify the operations that are being applied to the unknown variable. The unknown variable is x. Looking at the left hand side of the equation, x is divided by 4 (the denominator of the fraction) and then 2 is subtracted. Apply the inverse operations, one at a time, to both sides of the equation. We need to do the inverse operations in the reverse order. First we need to add 2 to both sides of the equation. Then we need to multiply both sides of the equation by 4. Write the final answer, checking that it is correct. The final answer is: We can check the answer by substituting the answer back into the original equation. \[\frac{20}{4}-2=20\div4 -2=5-2=3\] Solve: Identify the operations that are being applied to the unknown variable. The unknown variable is x. Looking at the left hand side of the equation, x is multiplied by 3, then divided by 4 (the denominator of the fraction) and then 1 is added. Apply the inverse operations, one at a time, to both sides of the equation. We need to do the inverse operations in the reverse order. First we need to subtract 1 to both sides of the equation. Then we need to multiply both sides of the equation by 5 and finally divide both sides by 3. Write the final answer, checking that it is correct. The final answer is: We can check the answer by substituting the answer back into the original equation. \[\frac{3\times10}{5}+1=\frac{30}{5}+1=6+1=7\] Solve: Identify the operations that are being applied to the unknown variable. The unknown variable is x. Looking at the left hand side of the equation, x is multiplied by 2, then 1 is subtracted. Then we divide by 7 (the denominator). Apply the inverse operations, one at a time, to both sides of the equation. We need to do the inverse operations in the reverse order. First we need to multiply both sides of the equation by 7. Then we need to add 1 to both sides and finally divide both sides by 2. Write the final answer, checking that it is correct. The final answer is: We can check the answer by substituting the answer back into the original equation. \[\frac{2\times11 -1}{7}=\frac{22-1}{7}=\frac{21}{7}=3\] Solve: Identify the operations that are being applied to the unknown variable. The unknown variable is x. Looking at the left hand side of the equation, x is the denominator. 24 is divided by x. Apply the inverse operations, one at a time, to both sides of the equation. We need to multiply both sides of the equation by x. Then we can divide both sides by 6. Write the final answer, checking that it is correct. The final answer is: We can check the answer by substituting the answer back into the original equation. \[\frac{24}{4}=24\div4=6\] Solve: Identify the operations that are being applied to the unknown variable. The unknown variable is x. Looking at the left hand side of the equation, x is the denominator. 18 is divided by x and then 6 is subtracted. Apply the inverse operations, one at a time, to both sides of the equation. First we add 6 to both sides of the equation. Then we need to multiply both sides of the equation by x.Then we can divide both sides by 9. Write the final answer, checking that it is correct. The final answer is: We can check the answer by substituting the answer back into the original equation. The solution to an equation can be different types of number. The unknown does not have to be an integer (whole numbers), it can also be a fraction or a decimal and can be positive or negative. The side of the equation that th unknown is on The unknown variable, represented by a letter, is often on the left hand side of the equations however it doesnt have to be. It could also be on the right hand side of an equation. Multiplying both sides of an equation When multiplying each side of the equation of a number, it is a common mistake to forget to multiply every term.E.g.Solve: \frac{x}{2}+3=9 Here we have not multiplied the +3 by 2 resulting in the incorrect answer: Here we have correctly multiplied each term by the denominator: Lowest common denominator (LCD) It is common to get confused between solving equations involving fractions and adding and subtracting fractions. When adding and subtracting we need to work out the lowest/least common denominator (sometimes called the lowest common multiple or lcm) whereas when we solve equations involving fractions we need to multiply both sides of the equation by the denominator of the fraction. 1. Solve \frac{x}{5}=3 (1 mark) x=15 for the correct answer (1) 2. Solve \frac{x-3}{7}=2 (2 marks) x-3=14 for the correct first step (1) x=17 for the correct answer (1) 3. Solve \frac{5a+6}{2}=23 (3 marks) 5a+6=46 for the correct first step (1) 5a=40 for the correct second step (1) x=8 for the correct answer (1) You have now learned how to: Solve equations when there are fractions Solve fractions where the unknown is the denominator Factorising Rearranging equations Simultaneous equations Prepare your KS4 students for maths GCSEs success with Third Space Learning. Weekly online one to one GCSE maths revision lessons delivered by expert maths tutors. Find out more about our GCSE maths tuition programme. We use essential and non-essential cookies to improve the experience on our website. Please read our Cookies Policy for information on how we use cookies and how to manage or change your cookie settings.AcceptPrivacy & Cookies Policy Two-step equation worksheets have a huge collection of printable practice pages to solve and verify the equations involving integers, fractions and decimals. Also, a number of exercise pdfs on translating two-step equations, MCQs and word problems based on geometric shapes are given here for additional practice for 7th grade and 8th grade students. Some of them are offered free of cost! Solving Two-Step Equations involving Whole Numbers Kick into gear solving single-variable two-step equations involving positive coefficients with this practice set! Rearrange the equations to make the variable the subject, and solve for its whole-number value. Solving Equations: Mixed Review Solve these mixed equations which involve fractions, integers and decimals. Each pdf two-step equation worksheet has ten problems for a thorough practice. Equation Word Problems Worksheets Utilize this set of worksheets to guide students of grade 7 and grade 8 to solve an array of diligently prepared equation word problems. (15 Worksheets) Multiple Choice Questions Identify the correct two-step equation or value from the given multiple responses. Each pdf worksheet has eight questions for practice. Who am I? Find me! Solve these interesting problems following the given hints. Ex. If you add 7 to three times of me, you get 34. What number am I? Integers: Mixed Operations | Level 1 A variety of one-step equations involving all the four basic operations are given in these mixed operation pdf worksheets. Perform the appropriate operation and solve for the unknown variable. Integers: Mixed Operations | Level 2 Taking your practice a step higher, the coefficients are rendered in positive and negative integers. Retain the variable on one side, take the coefficient and constant to the other side and solve. Fractions: Mixed Operations | Level 1 Add, subtract, multiply, and divide to solve the one-step fraction equations in these level 1 worksheets that involve proper and improper fractions as coefficients and constants. Fractions: Mixed Operations | Level 2 A moderate practice awaits 7th grade and 8th grade students here! Solve a series of one-step equations with their terms incorporating fractions as well as mixed numbers. Decimals: Mixed Operations The terms of the one-step equations in these worksheets are either decimals or integers. All four arithmetic operations are involved here to solve the problems. Integers, Fractions and Decimals In these printable worksheets, the coefficient of each one-step equation may be an integer, fraction or decimal. Complete practice can be given to children by solving these equations. One-Step Equation MCQs | Integers Plenty of multiple choice questions are available in these handouts. Solve the indicated equations and choose the correct integer values from the given options. One-Step Equation MCQs | Fractions Solving equations, finding the equation with a given solution, and evaluating expressions with the obtained values are the skills you can acquire in these pdf MCQ worksheets featuring fractions. Cost of the Product These printable worksheets contain an activity based exercise to find the cost of the products. The price tags of the objects are represented in an equation form. Solve the equations. Translating One-Step Equation Children in grade 6 should read each verbal phrases / sentences and translate it to an appropriate one-step linear equation. What Number am I? Guess my number! These fun math riddles help kids to easily understand and translate the sentences into equations. Try all these interesting problems. Solve for x in the following 12 problems. Example: 2x + 4 = 12 Remember to flip the symbol of the constant that has an operation first. Example: 7x + 4 = 46 Do not let the negative value throw you off the scent of the answer. Example: - 4x + 4 = - 12 You can reorder the problem before you start working on it. Example: - 3 + 7x = 4 Solve for x in the following 12 problems. Example: 3x + 4 = - 8 The arrange of values is the key here. Example: 5 - 3x = 8 See how fast you can complete all of these problems. Example: 3x + 4 = 19 See if you can start with the variable first. It is a good way to make sure you master this. Example: 3 + 2x = 17 Solve for x in the following 12 problems. Example: 7 + 2x = 19 More practice to make sure you know what you are doing. Example: 6x + 1 = 13 Learn how to solve the problem: x/2 + 3.5 = 21 Check by substituting your solution to the equation. Write an equation and solve for this number sentence: "When a number is divided by 5 and the result added to 35, the result is 105." Solve the equations. Check by substituting your solution to the equation. Example: 9 = a/4+ 4 Write an equation and solve for the following 10 sentences. These turn up the heat and are more difficult. Example: -13 = -5x + 7 Write an equation and solve for the following 3 sentences. Define the variable, write the equation and solve it: "Three more than two times a number is forty-three." Where is the variable? Create an equation and solve it: "Two less than a number divided by 5 is eight." For the following 10 problems locate the unknown variable and make an equation. Oh yeah, solve it too! Example: "Seven less than a number divided by 3 is five." What final value is being described by the math sentences? Example: "Two more than a number divided by 3 is eleven." This problems are great to help you start thinking algebraically. Why not read the problem and take an educated guess before you break down the algebra? We show you how to complete all the following problems. You don't always need to use the variable x. Try using something more abstract to make it interesting. It is always a good idea to write the components of the equation in the same order as the sentence. This walks you through all the steps you need to know. Practice this skill by completing the 6 problems on this sheet. See how well you know this topic. This is designed to be used as a whole class activity. Whether youre new to solving multi-step equations or simply studying before that big chapter test, Albert has you covered! This blog post will guide you through defining multi-step equations, examples of multi-step equations, and how to solve multi-step equations (including problems with fractions and words). Lets go! Return to the Table of Contents Remember, an equation is a mathematical sentence that uses an equal sign, = , to show that two expressions are equal. We began our study of solving equations with one-step equations, then we moved on to two-step equations. (Check out those links if you need a quick refresher!) Now we are moving to multi-step equations. A multi-step equation is an equation that takes two or more steps to solve. These problems can have a mix of addition, subtraction, multiplication, or division. We also might have to combine like terms or use the distributive property to properly solve our equations. So get your mathematical toolbox out! You never know what you might see in a multi-step equation! Multi-step equations are a wide-ranging category of equations. Some can be very simple, while others become more complex. Never fear! Were going to show you many examples of multi-step equations and how to solve these important aspects of Algebra 1. Here are some examples of multi-step equations: 5x + 10 = 3x + 12 8y - 3 - 2y = 5 4(3m - 2) = 16 5x - 10 + 5 = 20 - 5x Return to the Table of Contents Remember, an equation is solved when we have isolated the variable and found a value that makes the equation true. In order to solve equations, we use inverse operations to help us isolate the variable. \text{Addition} \leftrightarrow \text{Subtraction} \text{Multiplication} \leftrightarrow \text{Division} Another mathematical concept that will help when solving multi-step equations is the Order of Operations. To use the order of operations, we must first do any operations inside grouping symbols (parentheses, brackets, etc), then exponents, then multiplication or division (whatever comes first, left to right), then finally addition or subtraction (whatever comes first, left to right). You can remember this by the acronym, PEMDAS. Additionally, we may have to combine like terms on either side of the equation to help solve these equations. Eventually, you will create a one- or two-step equation that you will be able to solve similarly to previous problems! Here is an example of a multi-step equation with variables on both sides: Solve for x in the following equation: 8x - 10 = 4x + 2 Original equation Since there are variables on both sides, we must eliminate the variable from one side first. I suggest moving the 4x first, as to not create a negative. 8x - 4x - 10 = 4x - 4x + 2 Subtract 4x from each side 4x - 10 = 2 Simplify Now we are back to a basic two-step equation. 4x - 10 + 10 = 2 + 10 Add 10 from each side 4x = 12 Simplify \dfrac{4x}{4} = \dfrac{12}{4} Divide each side by 4 x = 3 Simplify To check you answer, you can simplify substitute 3 into the variable to see if the equation is true: 8x - 10 = 4x + 2 Original equation 8(3) - 10 = 4(3) + 2 Substitute 24 - 10 = 12 + 2 Simplify 14 = 14 \checkmark Answer confirmed Thus, x = 3 is the correct solution. Return to the Table of Contents Below is a short video from Mike DeVor showing more examples of solving multi-step equations: Now that we have been introduced to Multi-Step Equations, lets get those brain gears in motion and look at some more challenging examples! When dealing with an equation with more than one fraction, the easiest way to solve the equation is by finding the Least Common Denominator. The least common denominator is the smallest number that can be a common denominator for a set of fractions. Once we find the least common denominator, we will multiply each term by this value to eliminate the fraction. Here is an example of a multi-step equation with fractions: Solve for y in the following equation: \dfrac{5y}{6} - \dfrac{1}{4} = \dfrac{3y}{4} + \dfrac{1}{2} The denominators above are 2, 4, 6 , therefore the least common denominator for these numbers is 12 . So we will multiply each term by 12 . 12 \cdot \dfrac{5y}{6} - 12 \cdot \dfrac{1}{4} = 12 \cdot \dfrac{3y}{4} + 12 \cdot \dfrac{1}{2} Multiply each term by 12 \dfrac{60y}{6} - \dfrac{12}{4} = \dfrac{36y}{4} + \dfrac{12}{2} Result of multiplication 10y - 3 = 9y + 6 Simplify 10y - 9y - 3 = 9y - 9y + 6 Subtract 9y from each side y - 3 = 6 Simplify y - 3 + 3 = 6 + 3 Add 3 to each side y = 9 Simplify To check your answer, you can substitute 9 into the variable to see if the equation is true: \dfrac{5y}{6} - \dfrac{1}{4} = \dfrac{3y}{4} + \dfrac{1}{2} Original equation 10y - 3 = 9y + 6 Simplified equation (all terms multiplied by 12) 10 \cdot 9 - 3 = 9 \cdot 9 + 6 Substitute 90 - 3 = 81 + 6 Simplify 87 = 87 \checkmark Answer confirmed Therefore, y = 9 is the correct solution. Return to the Table of Contents Solve for z in the following equation: 2(3z - 4) = 10 Original equation 2(3z) - 2(4) = 10 Distributive Property 6z - 8 = 10 Simplify 6z - 8 + 8 = 10 + 8 Add 8 to each side 6z = 18 Simplify \dfrac{6z}{6} = \dfrac{18}{6} Divide each side by 6 z = 3 Simplify To check you answer, you can substitute 3 into the variable to see if the equation is true: 2(3z - 4) = 10 Original equation 2(3 \cdot 3 - 4) = 10 Substitute 2(9 - 4) = 10 Simplify 2(5) = 10 Simplify 10 = 10 \checkmark Answer confirmed Thus, z = 3 is the correct solution. Solve for m in the following equation: 3(m + 3) - 4 = 2(m - 2) Original equation 3(m) + 3(3) - 4 = 2(m) - 2(2) Distributive Property 3m + 9 - 4 = 2m - 4 Simplify 3m + 5 = 2m - 4 Combine like terms 3m - 2m + 5 = 2m - 2m - 4 Subtract 2m from each side m + 5 = - 4 Simplify m + 5 - 5 = - 4 - 5 Subtract 5 from each side m = -9 Simplify To check you answer, you can simplify substitute -9 into the variable to see if the equation is true: 3(m + 3) - 4 = 2(m - 2) Original equation 3(-9 + 3) - 4 = 2(-9 - 2) Substitute 3(-6) - 4 = 2(-11) Simplify -18 - 4 = -22 Combine like terms -22 = -22 \checkmark Answer confirmed Thus, m = -9 is the correct solution. Return to the Table of Contents Rob owns a coffee shop and is looking at finding a new coffee distributor for his beans. Distributor A sells their beans for \$5 a pound, plus a flat \$10 shipping fee. Distributor B sells their beans for \$2 a pound, plus \$1 per pound for shipping, plus a \$40 processing fee. What amount of pounds, p , would be a breakeven point for the two companies? Solution First, lets create an equation for the situation: 5p + 10 = 2p + 1p + 40 Original equation 5p + 10 = 3p + 40 Combine like terms 5p -3p + 10 = 3p - 3p + 40 Subtract 3p from each side 2p + 10 = 40 Simplify 2p + 10 - 10 = 40 - 10 Subtract 10 from each side 2p = 30 Simplify \dfrac{2p}{2} = \dfrac{30}{2} Divide each side by 2 p = 15 Simplify To check you answer, you can simplify substitute 15 into the variable to see if the equation is true: 5p + 10 = 2p + 1p + 40 Original equation 5(15) + 10 = 2(15) + 1(15) + 40 Substitute 75 + 10 = 30 + 15 + 40 Simplify 85 = 85 \checkmark Answer confirmed Therefore, the breakeven point for Distributor A and Distributor B would be 15 pounds. Sam goes to a bookstore with a coupon for \$5 off a book. The coupon is allowed to be used as many times as Sam wants. He ends up buying three books that all cost the same amount of money. The total cost for the books was \$45 . How much did each book cost, c , before the coupon was applied? First, lets set up an equation that models the situation: 3(c - 5) = 45 Since each book costs the same amount, we denote this amount by the variable, c . Then we applied the \$5 coupon to each book, and finally, we will multiply the cost of each book after the coupon by 3 . Now, simply solve for c like any other multi-step equation: 3(c) - 3(5) = 45 Distribute the 3 3c - 15 = 45 Simplify 3c - 15 + 15 = 45 + 15 Add 15 to both sides 3c = 60 Simplify \dfrac{3c}{3} = \dfrac{60}{3} Divide both sides by 3 c = 20 Solved Therefore, each book cost \$20 before the coupon was applied. A multi-step equation is an equation that requires two or more steps to solve.When solving: remember whatever you do to one side, you must do to the other.To solve multi-step equations with fractions, you can multiply each term by the least common denominator to eliminate the fractions first.To check the solution, simply substitute the value into the variable to see if the equation is true.You can model real-life situations with an equation and solve for a correct solution. Return to the Table of Contents Read these other helpful posts: Return to the Table of Contents

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