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Solve the equation and check the solution calculator

In this chapter, we will develop some techniques that help solve the problems declared in words. These techniques involve rewriting problems in the form of symbols. For example, the stated problem "finds a number that, if added to 3, yields 7" can be written as: 3 +? = 7, 3 + n = 7, 3 + x = 1 and so on, where the symbols?, N and X represent the number we want to find. We call these versions of stenography of equations of declared problems or symbolic phrases. Equations such as x + 3 = 7 are first degree equations, since the variable has an exponent of 1. The terms to the left of an equal sign constitute the member of the left of the equation; Those on the right constitute the right member. Therefore, in the equation x + 3 = 7, the element on the left is x + 3 and the member on the right is 7. The resolution of equations could be true or false, just like the phrases of words could be true or False. The equation: 3 + x = 7 will be false if any number except 4 is replaced for the variable. The value of the variable for which it is true the equation (4 in this example) is called the solution of the equation. We can determine if a given number is a solution of a given equation by replacing the number instead of the variable and determining the truth or false of the result. Example 1 Determine if the value 3 is an equation solution 4x - 2 = 3x + 1 solution we replace the value 3 for x in the equation and see if the member on the left is the same as the right element. 4 (3) - 2 = 3 (3) + 1 12 - 2 = 9 + 1 10 = 10 ANS. 3 is a solution. The first degree equations we consider in this chapter have at most a solution. The solutions for many such equations can be determined by the inspection. Example 2 Find the solution of any inspection equation. a. X + 5 = 12 b. 4 Ã‚ Â · x = -20 solutions a. 7 is the solution from 7 + 5 = 12. b. -5 is the solution from 4 (-5) = -20. Equation resolution Using the added and subtraction properties in section 3.1 We have solved some simple first-degree equations for inspection. However, the solutions of most equations are not immediately obvious by the inspection. So, we need some mathematical "tools to solve equations. Equivalent equations equivalent equations are equations that have identical solutions. Therefore, 3x + 3 = x + 13, 3x = x + 10, 2x = 10, and x = 5 are equivalent equations, since 5 is the only solution of each of them. Notice in the equation 3x + 3 = x + 13, the solution 5 is not obvious for inspection but in the equation x = 5, the solution 5 is obvious for inspection. To resolve any equation, we transform an equation whose solution may not be obvious to an equivalent equation whose solution is easily indicated. The following properties, sometimes called the property of additional subtraction, is a way we can generate equivalent equations. If the quantity itself is added or subtracted by both members of an equation, the resulting equation is equivalent to the original equation. In the symbols, A - B, A + C = B + C and A - C = B - C are equivalent equations. Example 1 Write an equivalent equation to X + 3 = 7 by subtracting 3 from each member. Solution by subtracting 3 from each member yield x + 3 - 3 = 7 - 3 ox = 4 warning that x + 3 = 7 ex = 4 are equivalent equations since the solution is the same for both, ie 4. next Example shows how we can generate equivalent equations simplifying one or both members of an equation before. Example 2 Write an equivalent equation at 4x- 2-3x = 4 + 6 Combining the terms and then adding 2 to each member. The combination of terms such as yields x-2 = 10 added 2 to each member of yields x-2 + 2 = 10 + 2 x = 12 to resolve an equation, we use the additional solution for An equation of an equivalent equation of the X = A shape, from which we can find the solution for inspection. Example 3 Solve 2x + 1 = X - 2. We want to obtain an equivalent equation in which all terms containing X are in a member and all the terms not containing X are in the other. If we us Add -1 to (or subtract 1 from) each member, we obtain 2x + 1- 1 = x - 2- 1 2x = x - 3 if we now add -xa (or subtrai x da) each member, we get 2x -x = x - 3 - XX = -3 where the solution -3 is obvious. The original equation solution is the number -3; However, the answer is often displayed in the form of the X = -3 equation. Because every equation obtained in the process is equivalent to the original equation, -3 is also a 2x + 1 = X - 2. solution in the previous example, we can control the replacement solution - 3 for x in the original equation 2 (-3) + 1 = (-3) - 2 -5 = -5 The symmetrical property of equality is also useful in the solution of equations. This property states if a = b then b = to this allows us to interchange the members of an equation whenever we don't have to be concerned about any sign changes. Therefore, if 4 = x + 2 then x + 2 = 4 if x + 3 = 2x - 5 then 2x - 5 = x + 3 if d = rt then rt = d there may be different ways to apply the property added above. Sometimes a method is better than another, and in some cases the symmetrical property of equality is also useful. Example 4 Solve 2x = 3x - 9. (1) Solution If we first add -3x to each member, we obtain 2x - 3x = 3x - 9 - 3x -x = -9 where the variable has a negative coefficient. Although we can see for inspection that the solution is 9, because - (9) = -9, we can avoid the negative coefficient by adding -2x and +9 to each member of the equation (1). In this case, we get 2x-2x + 9 = 3x- 9-2x + 9 9 = x from which the solution 9 is obvious. If we wish, we can write the last equation as X = 9 from the symmetrical property of equality. The resolution of equations using the division property considers the 3x = 12 equation the solution to this equation is 4. Also note that if we divide each member of the equation for 3, we obtain the equations whose solution is also 4. In general, we have the following properties, which is sometimes called division properties. If both members of an equation are divided by the same quantity (nonzero), the resulting equation is equivalent to the original equation. In symbols, they are equivalent equations. Example 1 Write an equivalent equation to -4x = 12 dividend each member from -4. Solution Split both members of -4 returns in the resolution of equations, we use the owner above to produce equivalent equations in which the variable has a coefficient of 1. Example 2 solved 3Y + 2Y = 20. Combine first the terms to get 5Y = 20. So, dividing each member for 5, we get in the next example, we use the property of additional joining and the property of the division to solve an equation. Example 3 solve 4x + 7 = x - 2. solution first, add -xe -7 to each member to obtain 4x + 7 - x - 7 = x - 2 - x - 1 forward, combination of similar terms it makes 3x = - 9 lasts, we divide each member from 3 to obtain the resolution equations using the multiplication property consider the equation the solution to this equation is 12. Also note that if we multiply each member of the equation of 4, we get the equations The solution of which is also 12. In general, we have the following properties, which is sometimes called multiplication properties. If both members of an equation are multiplied by the same quantity other than zero, the resulting equation is equivalent to the original equation. In the symbols, a = b and aÃ‚ · c = bÃ ¢ Â · c (c Ã ¢ â € ¢ 0) are equivalent equations. Example 1 Write an equivalent equation to multiply each member from 6. Solution Multiply each member of 6 yields in the resolution of equations, we use the property above to produce equivalent equations free from fractions. Example 2 Solve the first solution, multiply each 5 member to get now, divide Member for 3, Example 3 Solve. Solution First, simplify above the fraction bar to obtain the next, multiply each member from 3 to get the last time, dividing each member from 5 yields further equation solutions now we know all the techniques needed to resolve the more degrees . There is no specific order in which the properties should be applied. Applied. One or more of the following steps listed on page 102 can be appropriate. Procedure to solve first-degree equations: combine harvesters similar to each member of an equation. Using the addition or subtraction property, write the equation with all the terms containing the unknown in a holder and all the terms not containing the unknown in the other. Combine as terms in each member. Use multiplication properties to remove fractions. Use the division property to obtain a coefficient of 1 for the variable. Example 1 Solve 5x - 7 = 2x - 4x + 14. Solution First of all, as you combine terms, 2x - 4x, obtaining 5x - 7 = -2x + 14 later, add + 2x and +7 to each member and combine similar terms To obtain 5x - 7 + 2x + 7 = -2x + 14 + 2x + 1 7x = 21 Finally, divide each 7 member to obtain in the following example, we simplify over the fraction bar before applying the properties we have studied. Example 2 Solving solution First of all, you combine similar terms, 4x - 2x, to then add -3 to each member and simply simplify, multiply each member 3 to obtain finally, we divide each member for 2 to obtain solution formulas equations involving the Variables for measurements of two or more physical quantities are called formulas. We can solve for any of the variables in a formula if the values of other variables are known. We replace the known values in the formula and resolve for the unknown variable with the methods we have used in the previous paragraphs. Example 1 In the formula d = rt, t find if d = 24 er = 3. solution we can solve per t replacing 24 for d and 3 per r. Ie, d = rt (24) = (3) t 8 = t Often it is necessary to resolve formulas or equations in which there is more than one variable for one of the variables in terms of others. We use the same methods demonstrated in previous sections. Example 2 in the formula d = rt, resolves for women in terms of r and d. Solution We can solve for women in terms of R and D dividing both members to yield from which, by symmetrical law, in the previous example, we solved per woman applying the division structure to generate an equivalent equation. Sometimes, it is necessary to apply more than such a property. Example 3 In AX + b equation = C, to resolve X in terms of A, B, c. Solution We can solve for x by adding first -B to each member to get dividend every member from one, we have

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