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Solving Multi Step Equations Worksheet Questions and Answers PDF

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Part 1: Building a Foundation

What is the first step in solving a multi-step equation?

Hint: Think about the initial action you take when faced with an equation.

◯ Isolate the variable
◯ **Simplify both sides of the equation** ✔
◯ Use the distributative property
◯ Check the solution

▍ The first step is to simplify both sides of the equation.

What is the first step in solving a multi-step equation?

Hint: Think about isolating the variable.

◯ **Isolate the variable** ✔
◯ Simplify both sides of the equation
◯ Use the distributative property
◯ Check the solution

▍ The first step is to isolate the variable.

Which of the following are properties of equality? (Select all that apply)

Hint: Consider the rules that govern how we can manipulate equations.

☐ **Addition Property of Equality** ✔
☐ **Subtraction Property of Equality** ✔
☐ **Multiplication Property of Equality** ✔
☐ **Substitution Property of Equality** ✔

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The properties of equality include addition, subtraction, multiplication, and substitution.

Which of the following are properties of equality? (Select all that apply)

Hint: Consider the different operations that maintain equality.

☐ **Addition Property of Equality** ✓
☐ **Subtraction Property of Equality** ✓
☐ **Multiplication Property of Equality** ✓
☐ **Substitution Property of Equality** ✓

The properties of equality include addition, subtraction, multiplication, and substitution.

Explain why it is important to perform the same operation on both sides of an equation when solving it.

Hint: Think about maintaining balance in an equation.

Perform the same operation on both sides to maintain the equality of the equation.

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List the four main operations used in solving multi-step equations.

Hint: Think about the basic arithmetic operations.

1. What is the first operation?

> Addition

2. What is the second operation?

> Subtraction

3. What is the third operation?

> Multiplication

4. What is the fourth operation?

> Division

> The four main operations are addition, subtraction, multiplication, and division.

Part 2: Comprehension and Application

If you have the equation 3(x + 2) = 18, what is the first step to simplify it?

Hint: Consider how to deal with the parentheses.

○ Divide both sides by 3
○ Subtract 2 from both sides

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○ **Distribute the 3 into the parentheses** ✓
○ Add 2 to both sides

| The first step is to distribute the 3 into the parentheses.

If you have the equation 3(x + 2) = 18, what is the first step to simplify it?

Hint: Think about distributing the 3.

○ Divide both sides by 3
○ Subtract 2 from both sides
○ **Distribute the 3 into the parentheses** ✓
○ Add 2 to both sides

| The first step is to distribute the 3 into the parentheses.

When solving the equation 2x - 5 = 15, which steps are necessary? (Select all that apply)

Hint: Think about how to isolate the variable x.

☐ **Add 5 to both sides** ✓
☐ Subtract 5 from both sides
☐ **Divide both sides by 2** ✓
☐ Multiply both sides by 2

| You need to add 5 to both sides and then divide by 2.

When solving the equation 2x - 5 = 15, which steps are necessary? (Select all that apply)

Hint: Consider the operations needed to isolate x.

☐ **Add 5 to both sides** ✓
☐ **Subtract 5 from both sides** ✓
☐ Divide both sides by 2
☐ Multiply both sides by 2

| Necessary steps include adding or subtract 5 and then dividing by 2.

Describe how you would check if your solution to a multi-step equation is correct.

Hint: Think about substituting your solution back into the original equation.

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> **You can check your solution by substituting it back into the original equation to see if both sides are equal.**

Describe how you would check if your solution to a multi-step equation is correct.

Hint: Think about substituting your solution back into the original equation.

> **You can check your solution by substituting it back into the original equation to see if both sides are equal.**

Solve the equation 4x + 7 = 31. What is the value of x?

Hint: Isolate x by performing inverse operations.

○ **6** ✓
○ 7
○ 8
○ 9

> The value of x is 6.

Solve the equation 4x + 7 = 31. What is the value of x?

Hint: Think about isolating x.

○ **6** ✓
○ 7

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○ 8
○ 9

| The value of x is 6.

Given the equation 5(y - 3) = 20, which of the following are correct steps to solve for y? (Select all that apply)

Hint: Consider how to eliminate the parentheses and isolate y.

☐ **Divide both sides by 5 ✓**
☐ **Add 3 to both sides ✓**
☐ Subtract 3 from both sides
☐ Multiply both sides by 5

| You need to divide both sides by 5 and then add 3 to both sides.

Given the equation 5(y - 3) = 20, which of the following are correct steps to solve for y? (Select all that apply)

Hint: Consider the operations needed to isolate y.

☐ **Divide both sides by 5 ✓**
☐ Add 3 to both sides
☐ **Subtract 3 from both sides ✓**
☐ Multiply both sides by 5

| Correct steps include dividing by 5 and then adding or subtract 3.

Solve the equation 2(a + 4) = 3a - 6 and explain each step you took to find the solution.

Hint: Break down the equation step by step.

| **First, distribute the 2, then combine like terms and isolate a.**

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Solve the equation 2(a + 4) = 3a - 6 and explain each step you took to find the solution.

Hint: Think about distributing and isolating a.

> **You would distribute, combine like terms, and isolate a.**

Part 3: Analysis, Evaluation, and Creation

In the equation 6z - 4 = 2z + 8, what should be your first step to isolate the variable z?

Hint: Think about how to eliminate z from one side.

◯ Add 4 to both sides
◯ **Subtract 2z from both sides ✓**
◯ Add 2z to both sides
◯ Subtract 6z from both sides

> The first step is to subtract 2z from both sides.

In the equation 6z - 4 = 2z + 8, what should be your first step to isolate the variable z?

Hint: Think about moving terms involving z to one side.

◯ Add 4 to both sides
◯ **Subtract 2z from both sides ✓**
◯ Add 2z to both sides
◯ Subtract 6z from both sides

> The first step is to subtract 2z from both sides.

Which of the following equations require the use of the distributative property to simplify? (Select all that apply)

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Hint: Look for parentheses in the equations.

☑ **3(x + 5) = 15** ✓
☐ 4x - 2 = 10
☑ **2(3y - 4) = 8** ✓
☐ x/2 + 3 = 7

▎The equations that require distribution are 3(x + 5) = 15 and 2(3y - 4) = 8.

Which of the following equations require the use of the distributative property to simplify? (Select all that apply)

Hint: Consider equations with parentheses.

☑ **3(x + 5) = 15** ✓
☐ 4x - 2 = 10
☑ **2(3y - 4) = 8** ✓
☐ x/2 + 3 = 7

▎Equations that require the distributative property include those with parentheses.

Analyze the equation 7x + 2 = 3x + 18. Describe the steps you would take to solve for x and why each step is necessary.

Hint: Break down the equation into manageable parts.

▎**You would first subtract 3x from both sides, then subtract 2, and finally divide by 4.**

Analyze the equation 7x + 2 = 3x + 18. Describe the steps you would take to solve for x and why each step is necessary.

Hint: Think about isolating x and combining like terms.

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> **You would isolate x by moving terms and combining like terms.**

Which strategies can be used to solve complex multi-step equations effectively? (Select all that apply)

Hint: Think about methods that simplify the process.

☐ **Breaking down the equation into simpler parts ✓**
☐ Using a calculator for every step
☐ **Checking each step for accuracy ✓**
☐ **Writing down each step clearly ✓**

> Effective strategies include breaking down the equation into simpler parts, checking each step for accuracy, and writing down each step clearly.

Which strategies can be used to solve complex multi-step equations effectively? (Select all that apply)

Hint: Consider different approaches to problem-solving.

☐ **Breaking down the equation into simpler parts ✓**
☐ Using a calculator for every step
☐ **Checking each step for accuracy ✓**
☐ **Writing down each step clearly ✓**

> Strategies include breaking down the equation and checking each step.

Create your own multi-step equation and provide a detailed solution. Explain each step and the reasoning behind it.

Hint: Think creatively about the equation you want to create.

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Create an equation such as 3(x - 1) + 4 = 10 and explain the steps taken to solve it.

Create your own multi-step equation and provide a detailed solution. Explain each step and the reasoning behind it.

Hint: Think about a problem you would like to solve.

You should create an equation and explain the steps taken to solve it.

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