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 order of operations.

- ◯ Combine like terms
- ◯ Use inverse operations
- ◯ **Simplify each side ✓**
- ◯ Check the solution

> The first step is to simplify each side of the equation.

Which of the following are considered inverse operations? (Select all that apply)

Hint: Think about operations that undo each other.

- ☐ **Addition and Subtraction ✓**
- ☐ **Multiplication and Division ✓**
- ☐ Exponentiation and Logarithms
- ☐ Addition and Multiplication

> Inverse operations include addition and subtraction, and multiplication and division.

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

Hint: Consider the properties of equality.

Perform the same operation on both sides to maintain the equality and ensure the solution is valid.

List the steps involved in solving a multi-step equation.

Hint: Think about the logical sequence of operations.

1. Step 1

Simplify each side.

2. Step 2

Use inverse operations.

3. Step 3

Isolate the variable.

The steps typically include simplifying, using inverse operations, and isolating the variable.

Which property is used to simplify the expression 3(x + 4)?

Hint: Consider how to distribute the number outside the parentheses.

- ◯ Associative Property
- ◯ **Distributative Property ✓**

- ◯ Communtative Property
- ◯ Identity Property

> The Distributative Property is used to simplify the expression.

Part 2: Understanding and Application

In the equation 2x + 3 = 11, which steps are needed to solve for x? (Select all that apply)

Hint: Think about how to isolate x.

- ☐ **Subtract 3 from both sides ✓**
- ☐ Add 3 to both sides
- ☐ **Divide both sides by 2 ✓**
- ☐ Multiply both sides by 2

> You need to subtract 3 from both sides and then divide by 2.

Describe how combining like terms can simplify solving multi-step equations.

Hint: Consider the impact on the equation's complexity.

> **Combining like terms reduces the number of terms, making the equation simpler and easier to solve.**

Solve the equation: 4(x - 2) = 8. What is the value of x?

Hint: Think about isolating x step by step.

- ◯ 0
- ◯ 2
- ◯ 4
- ◯ **6 ✓**

The value of x is 6 after solving the equation.

Given the equation 5x - 3 = 2x + 9, which operations will help isolate x? (Select all that apply)

Hint: Consider how to move terms around the equation.

- [x] **Add 3 to both sides ✓**
- [x] **Subtract 2x from both sides ✓**
- [ ] Subtract 5x from both sides
- [ ] Add 2x to both sides

You can add 3 to both sides and subtract 2x from both sides to isolate x.

Solve the equation 3(x + 5) = 2x + 15 and explain each step.

Hint: Break down the equation step by step.

The solution involves distributing, combining like terms, and isolating x.

Part 3: Analysis, Evaluation, and Creation

In the equation 2(x + 3) = x + 6, what mistake might lead to an incorrect solution?

Hint: Think about common errors in distribution.

- ◯ **Forgetting to distribute the 2 ✓**
- ◯ Combining like terms incorrectly
- ◯ Not subtract x from both sides
- ◯ Adding 3 to both sides

Forgetting to distribute the 2 can lead to an incorrect solution.

Analyze the equation 3x + 4 = 2x + 10. Which of the following are true? (Select all that apply)

Hint: Consider the steps needed to simplify the equation.

- [x] **Subtract 2x from both sides simplifies the equation ✓**
- [ ] Adding 4 to both sides is necessary
- [ ] The solution involves only one step
- [x] **The equation can be solved by isolating x ✓**

> Subtract 2x from both sides simplifies the equation, and the solution involves isolating x.

Analyze the steps needed to solve the equation 4x - 7 = 2(x + 3) and identify any potential errors.

Hint: Break down the equation and look for mistakes.

> **The steps include distributing and combining like terms, with potential errors in distribution.**

Which equation represents a correctly solved multi-step equation?

Hint: Consider the properties of equality and operations.

- ◯ **3(x + 2) = 3x + 6 ✓**
- ◯ 2x + 5 = 2(x + 2)
- ◯ x/2 + 3 = 2x + 6
- ◯ 4(x - 1) = 4x - 4

> The equation 3(x + 2) = 3x + 6 is correctly solved.

Create a multi-step equation that has a solution of x = 5. Which of the following could be your equation? (Select all that apply)

Hint: Think about how to construct equations with known solutions.

- [x] **2x + 10 = 20 ✓**
- [ ] 3(x - 1) = 12

- [ ] x + 4 = 9
- [ ] **5x = 25 ✓**

> Equations like 2x + 10 = 20 and 5x = 25 have a solution of x = 5.

Design a real-world problem that can be solved using a multi-step equation, and explain how you would solve it.

Hint: Think about practical applications of equations.

> **A real-world problem could involve budgeting or distance, and the solution involves setting up and solving the equation.**