

NAME \_\_\_\_\_

**Module 3** Solving Linear Equations  
of One Variable**Lesson 4** Solving Two-Step Linear Equationsguided  
notes**Lesson Objectives**

- Solve two-step equations.
- Check solutions.
- Determine if a number is a solution for a two-step equation.
- Provide reasons for each step in solving a two-step equation.

To solve equations, you must use **inverse** operations. You can think of this as working backwards.

If you pick a number, multiply by 5, and add 3, the result is 23. To find the original number you should **subtract** 3 from 23 to get **20**. Then **divide** by 5. The original number was **4**.

Multiplying a number by 5 and then adding 3 to get a result of 23 can be written as the equation  **$5x + 3 = 23$** .

To evaluate the expression  $5x + 3$ , we would **multiply** first, and then **add**. When we solve the equation by working backwards, we undo addition first by **subtraction**, and then undo multiplication by dividing.

Solve:  $5x + 3 = 23$

$5x + 3 - \mathbf{3} = 23 - \mathbf{3}$

$5x = 20$

$x = \mathbf{4}$

Check:  $5x + 3 = 23$

$5(\mathbf{4}) + 3 \stackrel{?}{=} 23$

$\mathbf{20} + 3 \stackrel{?}{=} 23$

$23 = 23 \checkmark$

The solution is **4**.

$$\begin{array}{l} \text{Solve:} \quad \frac{M}{6} - 10 = -12 \\ \frac{M}{6} - 10 + \underline{10} = -12 + \underline{10} \\ \frac{M}{6} = \underline{-2} \\ 6 \cdot \frac{M}{6} = 6 \cdot (-2) \\ M = \underline{-12} \end{array}$$

$$\begin{array}{l} \text{Check:} \quad \frac{M}{6} - 10 = -12 \\ \frac{-12}{6} - 10 \stackrel{?}{=} -12 \\ \underline{-2} - 10 \stackrel{?}{=} -12 \\ -12 = -12 \checkmark \end{array}$$

The solution is -12.

1 Is 2 a solution of the equation  $-7C - 10 = -4$ ?

$$\text{Check: } -7C - 10 = -4$$

$$-7(\underline{2}) - 10 \stackrel{?}{=} -4$$

$$\underline{-14} - 10 \stackrel{?}{=} -4$$

$$-24 \neq -4$$

Circle the correct answer: 2 is is not a solution.

2 Explain how to solve the equation  $\frac{p}{5} + 9 = 13$

First, subtract 9 from both sides of the equation. Then multiply both sides by 5.

3 Solve:  $-4J - 1 = 11$

$$\underline{-4J - 1 + 1 = 11 + 1}$$

$$\underline{-4J = 12}$$

$$\underline{\frac{-4J}{-4} = \frac{12}{-4}}$$

$$\underline{J = -3}$$

It is not always necessary to show all the “steps”, but be sure you can explain all your steps.

Each step has a reason.

Statements	Reasons
Example: $5x + 3 = 23$	Given
$5x = 23$	<u>Subtraction Property of Equality</u>
$x = 4$	<u>Division Property of Equality</u>

- 4 Explain the steps used to solve the equation  $\frac{A}{-3} + 12 = 4$ .

Statements

Reasons

$$\frac{A}{-3} + 12 = 4$$

Given

$$\frac{A}{-3} = -8$$

**Subtraction Property of Equality**

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$$A = 24$$

**Multiplication Property of Equality**

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