We will solve two-step equations. | **Concept Development**

A **two-step equation** contains$_2$ two operations.

- **Two-step equations** require$_3$ two **inverse operations** to solve for the **variable**.
- To keep an equation **balanced**, **inverse operations** must be done on both sides of the equations.
- The **solution** is the value of the variable that makes the equation true.

multiplication

$2x + 3 = 7$

addition

division

$\frac{x}{4} - 5 = 1$

subtraction

Inverse Operation

$2 \bullet m + 2 = 8$

$-2 \quad -2$

Balance

$2m + 0 = 6$

Inverse Operation

$\frac{2m}{2} \quad \frac{6}{2}$

Balance

$m = 3$

$2 \bullet m + 2 = 8$

Inverse Operation

$-2 \quad -2$

Balance

$2m + 0 = 6$

Inverse Operation

$\frac{2m}{2} \quad \frac{6}{2}$

Balance

$m = 3$ **Solution**

Solution
m = 3

$2m + 2 = 8$
$2(3) + 2 = 8$
$6 + 2 = 8$
$8 = 8$ ✓

NOT a Solution
m = 2

$2m + 2 = 8$
$2(2) + 2 = 8$
$4 + 2 = 8$
$6 \neq 8$ ×

We will solve two-step equations. | **Skill Development/ Guided Practice**

1. Isolate the variable.
2. Solve for the variable. (inverse operation)
3. Check and interpret the solution.

1. $5m + 15 = 25$

Check:

Interpret:
The inverse operations
used to solve this problem is

_____

The value of the variable is _____

2. $3b + 6 = -18$

Check:

Interpret:
The inverse operations
used to solve this problem is

_____

The value of the variable is _____

3. $2k - 9 = -21$

Check:

Interpret:
The inverse operations
used to solve this problem is

_____

The value of the variable is _____

4. $4d - 7 = 5$

Check:

Interpret:
The inverse operations
used to solve this problem is

_____

The value of the variable is _____

1. Isolate the variable.
2. Solve for the variable. (inverse operation)
3. Check and interpret the solution.

5. $\frac{c}{6} + 1 = -1$

Check:

Interpret:
The inverse operations
used to solve this problem is

_____

The value of the variable is _____

6. $\frac{v}{4} + 8 = 9$

Check:

Interpret:
The inverse operations
used to solve this problem is

_____

The value of the variable is _____

7. $\frac{x}{2} - 3 = -2$

Check:

Interpret:
The inverse operations
used to solve this problem is

_____

The value of the variable is _____

8. $\frac{t}{5} - 6 = -3$

Check:

Interpret:
The inverse operations
used to solve this problem is

_____

The value of the variable is _____

Skill Closure

1. Isolate the variable.
2. Solve for the variable. (inverse operation)
3. Check and interpret the solution.

1. $9w + 11 = 56$

Check:

Interpret:
The inverse operations
used to solve this problem is

_____

The value of the variable is _____

2. $7g - 6 = 50$

Check:

Interpret:
The inverse operations
used to solve this problem is

_____

The value of the variable is _____

Concept Closure

Writing

Which two inverse operations would be used to solve the equation? Explain your answer.

$$\frac{x}{10} - 7 = 5$$

Solve for the variable. Check and interpret the solution.

1. $-5x + 9 = 44$

Check:

Interpret:
The inverse operations
used to solve this problem is

_____

The value of the variable is _____

2. $3x - 12 = -3$

Check:

Interpret:
The inverse operations
used to solve this problem is

_____

The value of the variable is _____

3. $\frac{z}{3} + 2 = -5$

Check:

Interpret:
The inverse operations
used to solve this problem is

_____

The value of the variable is _____

4. $\frac{d}{12} - 9 = -11$

Check:

Interpret:
The inverse operations
used to solve this problem is

_____

The value of the variable is _____

Listening

Listen to the problem. Solve, check and interpret the solution.

1. $2b + 2 = 6$

Interpret:
The inverse operations used to solve this problem is

_____

The value of the variable is _____

2. $\frac{a}{2} + 4 = 12$

Interpret:
The inverse operations used to solve this problem is

_____

The value of the variable is _____

Reading

Read the problem. Solve, check and interpret the solution.

On Saturday, Janice bought five new books. On Monday, half of all her books were lost in a fire. On Tuesday, there were only 17 left. How many did she have to start with?

1. $\frac{b}{2} + 5 = 17$

Interpret:
The inverse operations used to solve this problem is_____

The value of the variable is _____

For a field trip, 4 students rode in cars and the rest fit into nine buses. How many students were in each bus if 382 students were on the trip?

2. $9s + 4 = 382$

Interpret:
The inverse operations used to solve this problem is_____

The value of the variable is _____

Writing

Describe and correct the error each problem has.

1.

$$6b + 7 = 331$$
$$+7 \quad +7$$

$$\frac{6b}{6} + 0 = \frac{338}{6}$$

$$b = \frac{\mathbf{169}}{\mathbf{3}}$$

2.

$$4e + 5 = 25$$
$$-5 \quad -5$$

$$4 \cdot 4e \quad 0 = 20 \cdot 4$$

$$e = \mathbf{80}$$