

CHAPTER 6:

Equations and Inequalities

Section 6.1: Solving Equations using Inverse Operations

Inverse Operations:

Inverse operations "undo" or reverse each other's result.

Examples of Inverse Operations: - Addition and Subtraction
- Multiplication and Division

Inverse operations takes us back to where we started!

For example, a. $2 + 3 = 5$ and $5 - 3 = 2$

 b. $2 \times 3 = 6$ and $\frac{6}{3} = 2$

We can use inverse operations to solve many types of equations.
To do this, we:

1. determine the operations that were applied to the variable to **build** the equation.
2. then use the **inverse operation** to isolate the variable (get x by itself) by "undoing" the operation.

Keeping in mind that whatever we do to one side of the equation, we do to the other to keep the equation **"balanced"**.

For example, to solve $x + 2.4 = 6.5$

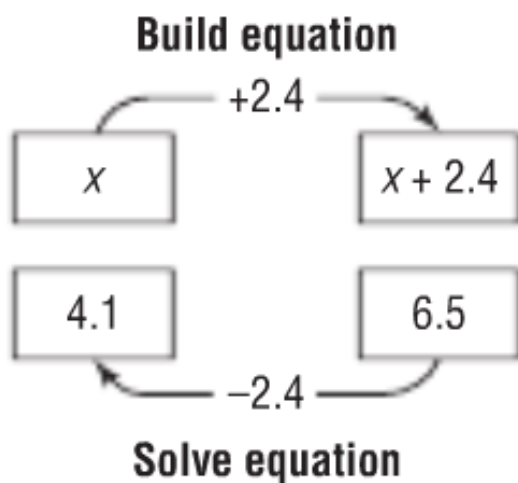
Step 1: Start with x

Step 2: Identify the operation applied to produce $x + 2.4$

add 2.4

Step 3: Apply the inverse operation to isolate x .

subtract 2.4



Algebraically,

$$x + 2.4 = 6.5$$

$$x + 2.4 = 6.5$$

$$\underline{-2.4 \quad -2.4}$$

$$x = 4.1$$

We can verify our solution:

- put your answer back into the equation to show that it works.

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Example 1:

Solve using inverse operations and algebraically:

$$x - 4.3 = -5.6$$

Operation: _____

-

Inverse Operation

Algebraically

Example 2:

Solve using inverse operations and algebraically:

Three times a number is -3.6

Operation: _____

Inverse: _____

Inverse Operation

Algebraically

Example 3:

Solve using inverse operations and algebraically:

A number divided by 4 is 1.5

Operation: _____

Inverse: _____

Inverse Operation

Algebraically

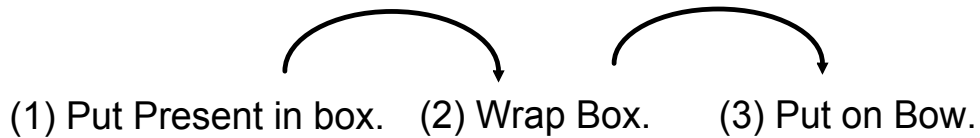
Solving Two-Step Equations

NOTE: To "undo" a sequence of operations, we perform the inverse operations in the **reverse** order.

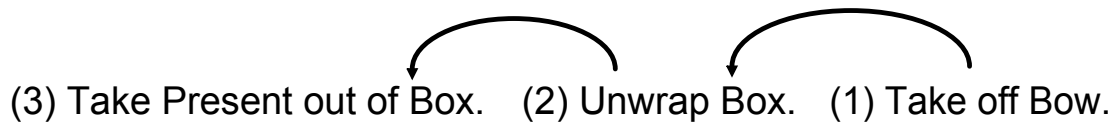
In other words, we have to "undo" the last step first!

Example:

Wrapping A Present



Unwrapping A Present



Example 4:

Solve: $4.5d - 3.2 = -18.5$

Inverse Operation

Algebraically



Operation: _____

Inverse: _____

Example 5:

Solve: $\frac{x}{4} + 3 = 7.2$

Inverse Operation

Algebraically

Operation: _____

Inverse: _____

Your Turn:

a. $3p - 4 = 5$

b. $1.9 + n = 6.8$

Example 6: Using reciprocals

Solve and verify:

Inverse Operation: _____

$$\frac{4.2}{x} = 3$$

Example 7:

Solve and verify:

Inverse Operation: _____

$$\frac{2}{x} = 0.5$$

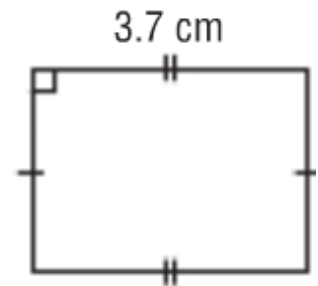
Example 8: Seven percent of a number is 56.7.

- a) Write, then solve an equation to determine the number.
- b) Check the solution.

Example 9:

A rectangle has length 3.7cm and perimeter 13.2cm.

- a) Write an equation that can be used to determine the width of the rectangle.
- b) Solve the equation.
- c) Verify the solution.



Inverse

Distributive Property

Solving Equations Involving Distributive Property

Example 10:

Solve:

a) $2(3.7 + x) = 13.2$

b) $6 = 1.5(x - 6)$

c) $3(x - 5) = 2$