

What Is Solving and Explaining Two-Step Equations Involving Whole Numbers and Using Inverse Operations?

- An algebraic equation is an expression in which a letter represents an unknown number such as, $n + 5 = 11$ ($n = 6$).
- An inverse operation is one that “undoes” or reverses another. Addition and subtraction are inverse operations, and so are multiplication and division.
- Using an inverse operation allows us to calculate the value of the unknown number by moving all the known numbers to one side of the equation.
- Two-step equations involve balancing both sides of the equation. To solve $5 + n = 11$, subtract 5 (the inverse operation of addition) from both sides.

How to solve
by using inverse



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numbers

- To solve $n - 6 = 4$, add 6 to both sides of the equation because addition is the inverse of subtraction. $n - 6 = 4$ becomes $n = 10$.
- An algebraic equation must stay in balance, so whatever is done to one side must be done to the other. To solve this problem:
 - $n - 6 = 4$
 - Add 6 to both sides of the equation because addition is the inverse of subtraction
 - $n = 10$.

- Just as addition and subtraction are inverse operations, so are multiplication and division. To solve this problem:
 - $6n = 30$
 - Divide both sides of the equation by 6 because division is the inverse of multiplication
 - $n = 5$.
- When solving two-step equations, first add or subtract both sides using the inverse operation of the one in the equation. **Addition and subtraction are ALWAYS done first.**
 - $2n + 4 = 14$
 - First subtract 4 from each side
 - $2n = 10$



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is used
is used
- $n/8 - 6 = 10$ (add 6 to both sides)
- $n/8 = 16$ (multiply both sides by 8)
- $n = 128$
- $5n + 5 = 20$ (subtract 5 from both sides)
- $5n = 15$ (divide both sides by 5)
- $n = 3$

Try This!

$$12n - 5 = 31$$

$$n/7 + 5 = 31$$

$$9n + 4 = 4$$

**PREVIEW**

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$$n/6 - 18 = 2$$

$$3n - 14 = 16$$
