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## Solving Two-Step Equations

$$\begin{array}{r} x \times 2 + 8 = 30 \\ -8 \quad -8 \\ \hline x \times 2 = 22 \\ \frac{x \times 2}{2} = \frac{22}{2} \\ \hline x = 11 \end{array}$$

Step 1

Step 2

- 1 Describe how to solve two-step equations.
- 2 Determine the equation describing the situation.
- 3 Solve the equation.
- 4 Determine how many photos Shannon and her friends can take.
- 5 Solve the following equations.
- 6 Set up an equation to model the situation.
- + with lots of tips, answer keys, and detailed answer explanations for all of the problems.



The complete package, including all problems, hints, answers, and detailed answer explanations is available for all [sofatutor.com](https://www.sofatutor.com) subscribers.



## Describe how to solve two-step equations.

Choose the correct statements.

- A  
To solve two-step equations, you have to isolate the variable.
- B  
When solving two-step equations, the first step is always multiplication.
- C  
First, you have to use the Distributive Property.
- D  
In two step equations, after you combine like terms you use opposite operations.
- E  
The opposite operation of addition is division.



## Hints for solving these problems

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of 6

### Describe how to solve two-step equations.

#### Hint #1

Use **Opposite Operations**:

- Multiplication ( $\times \longleftrightarrow$ )  $\div$
  - Division ( $\div \longleftrightarrow$ )  $\times$
  - Addition ( $+$   $\longleftrightarrow$ )  $-$
  - Subtraction ( $- \longleftrightarrow$ )  $+$
-



## Answers and detailed answer explanations for these problems

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### Describe how to solve two-step equations.

**Answer key:** A, D

To solve algebraic equations, you must isolate the variable by using **Opposite Operations**.

For solving two-step equations, you have to use **Opposite Operations** twice. First use **Opposite Operations** to remove the constant then again to remove the coefficient to the variable.

Use **Opposite Operations**:

- Multiplication ( $\times \longleftrightarrow \div$ )
- Division ( $\div \longleftrightarrow \times$ )
- Addition ( $+$   $\longleftrightarrow$   $-$ )
- Subtraction ( $- \longleftrightarrow +$ )

Let's have a look at the following equation:

$$3 \times x - 4 = 8.$$

#### Step 1

- Since we have  $-4$  on the left side of the equation, we should **add 4** on both sides of the equation to get  $3 \times x = 12$ .

#### Step 2

- In order to isolate the variable  $x$ , we use the **Opposite Operation** of multiplication, which is division. So we **divide** by  $3$  on both sides of the equation to get  $x = 4$ .