

Grab a half sheet from the front table and start warming up. Have your homework out ready to check.

Classwork - Two Step Equations

Solve the following equations. If you need to simplify the left or right side before you solve, do so and then rewrite the new equation. Make sure you show how you are undoing operations on **BOTH** sides of the equation.

A) $x + 8 = 3$

$$\begin{array}{r} x + 8 = 3 \\ -8 \quad -8 \\ \hline x = -5 \end{array}$$

B) $2 \cdot \frac{x}{2} = -14 \cdot 2$

$$x = -28$$

C) $-6x = 45$

$$\begin{array}{r} -6x = 45 \\ \div -6 \quad \div -6 \\ \hline x = -7.5 \end{array}$$

D) $4 + x - 10 = -2$

$$\begin{array}{r} 4 + x - 10 = -2 \\ x - 6 = -2 \\ +6 \quad +6 \\ \hline x = 4 \end{array}$$

E) $-5x + 8x = -24$

$$\begin{array}{r} 3x = -24 \\ \div 3 \quad \div 3 \\ \hline x = -8 \end{array}$$

F) $2x - 4x = -8 + 14$

$$\begin{array}{r} -2x = 6 \\ \div -2 \quad \div -2 \\ \hline x = -3 \end{array}$$

1) Solve the following one-step equations. Make sure to show inverse operations on BOTH sides and WORK DOWN. SHOW ALL WORK. Guess and Check is not a method to use anymore.

$$\begin{array}{l} \text{A) } x - 7 = -9 \\ \quad +7 \quad +7 \\ \hline x = -2 \end{array}$$

$$\begin{array}{l} \text{B) } 8 \cdot \frac{x}{8} = -5 \cdot 8 \\ \hline x = -40 \end{array}$$

$$\begin{array}{l} \text{C) } -x = 5 \\ \quad -1x = 5 \\ \quad \frac{-1}{-1} \quad \frac{-1}{-1} \\ \hline x = -5 \end{array}$$

$$\begin{array}{l} \text{D) } x + 17 = -6 \\ \quad -17 \quad -17 \\ \hline x = -23 \end{array}$$

$$\begin{array}{l} \text{E) } 3.5x = -21 \\ \quad \frac{3.5}{3.5} \quad \frac{3.5}{3.5} \\ \hline x = -6 \end{array}$$

$$\begin{array}{l} \text{F) } b - 26 = 19 \\ \quad +26 \quad +26 \\ \hline b = 45 \end{array}$$

2) Simplify and THEN solve the following one-step equations. Make sure to show inverse operations on BOTH sides and WORK DOWN. SHOW ALL WORK. Guess and Check is not a method to use anymore.

$$A) x(-4+9) = 15$$

$$x+5 = 15$$

$$\frac{-5}{-5} \quad \frac{-5}{-5}$$

$$x = 10$$

$$D) x(+11-9) = -8$$

$$x+3 = -8$$

$$\frac{-3}{-3} \quad \frac{-3}{-3}$$

$$x = -11$$

$$G) (3g-6g) = (-10+4)$$

$$\frac{-3g}{-3} = \frac{-6}{-3}$$

$$g = 2$$

$$B) \frac{x}{-5} = (8+3)$$

$$-5 \cdot \frac{x}{-5} = 11 \cdot -5$$

$$x = -55$$

$$E) (-3x)(-12x) = -90$$

$$\frac{-15x}{-15} = \frac{-90}{-15}$$

$$x = 6$$

$$H) (-2x+14) = (8x-15x)$$

$$\frac{-14}{-7} = \frac{-7x}{-7}$$

$$2 = x$$

$$C) (x-11) = -40$$

$$\frac{-10x}{-10} = \frac{-40}{-10}$$

$$x = 4$$

$$F) (b+6-11) = 3$$

$$b-5 = 3$$

$$\frac{+5}{+5} \quad \frac{+5}{+5}$$

$$b = 8$$

$$I) \frac{x}{12} = -5-7$$

$$12 \cdot \frac{x}{12} = -12 \cdot 12$$

$$x = -144$$

Solving 2-step equations

In a two-step equation, there are 2 different operations that are acting on the variable.

<p><u>Using only numbers</u></p> $2(3) + 7 = 13$ $6 + 7 = 13$ <p>What operations are acting on the 3?</p> <p><u>multipl. of 2</u></p> <p><u>addition of 7</u></p>	<p><u>Using only numbers</u></p> $\frac{(20)}{4} - 2 = 3$ <p>What operations are acting on the 20?</p> <p><u>division of 4</u></p> <p><u>subtract of 2</u></p>	<p><u>Using a variable</u></p> $5x - 10 = -25$ <p>What operations are acting on the x?</p> <p><u>multipl. of 5</u></p> <p><u>subtract of 10</u></p>	<p><u>Using only numbers</u></p> $\frac{x}{5} - 2 = -4$ <p>What operations are acting on the x?</p> <p><u>division of 5</u></p> <p><u>subtract of 2</u></p>
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Solving 2-step equations

Solving 2-step equations means we need to undo 2 operation before finding the value of $1x$ or x .

Goal: Keep making the equation simpler in order to find the value of $1x$ or x .

Process:

- 1) Look at what operations are acting on your variable
- 2) Undo the multiple operations that are acting on your variable
 - * First: Undo Addition or Subtraction
 - Second: Undo Multiplication or Division
- 3) Find the value of $1x$
- 4) Check your answer

For the following problems, you will be given a two-step equation. Following the instruction above and undo the operations acting on x until you find the value of $1x$ or x .

$2x + 4 = 42$ $\begin{array}{r} -4 \quad -4 \\ \hline 2x = 38 \\ \div 2 \quad \div 2 \\ \hline 1x = 19 \end{array}$	<p><u>What operations are acting on x?</u> <u>1st</u> Undo <u>+4</u> by <u>-4</u> on BOTH sides</p> <p>Rewrite the new equation</p> <p><u>2nd</u> Undo <u>•2</u> by <u>÷2</u> on BOTH sides</p> <p>State the value of $1x$ or x.</p> <p>Check the answer.</p>
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$\frac{x}{5} + 4 = 42$ $\begin{array}{r} -4 \quad -4 \\ \hline \frac{x}{5} = 38 \\ \cdot 5 \quad \cdot 5 \\ \hline 1x = 190 \end{array}$	<p><u>What operations are acting on x?</u> <u>1st</u> Undo <u>+4</u> by <u>-4</u> on BOTH sides</p> <p>Rewrite the new equation</p> <p><u>2nd</u> Undo <u>÷5</u> by <u>•5</u> on BOTH sides</p> <p>State the value of $1x$ or x.</p> <p>Check the answer.</p>
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$\frac{x}{3} - 12 = -7$ $\begin{array}{r} +12 \quad +12 \\ \hline \frac{x}{3} = 5 \\ \cdot 3 \quad \cdot 3 \\ \hline 1x = 15 \end{array}$	<p><u>What operations are acting on x?</u> <u>1st</u> Undo <u>-12</u> by <u>+12</u> on BOTH sides</p> <p>Rewrite the new equation</p> <p><u>2nd</u> Undo <u>÷3</u> by <u>•3</u> on BOTH sides</p> <p>State the value of $1x$ or x.</p> <p>Check the answer.</p>
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$-6 - 4x = 18$ $\begin{array}{r} +6 \quad +6 \\ \hline -4x = 24 \\ \div -4 \quad \div -4 \\ \hline 1x = -6 \end{array}$	<p><u>What operations are acting on x?</u> <u>1st</u> Undo <u>-6</u> by <u>+6</u> on BOTH sides</p> <p>Rewrite the new equation</p> <p><u>2nd</u> Undo <u>•-4</u> by <u>÷-4</u> on BOTH sides</p> <p>State the value of $1x$ or x.</p> <p>Check the answer.</p>
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Solving 2-step equations

Solving 2-step equations means we need to undo 2 operation before finding the value of $1x$ or x .

Goal: Keep making the equation simpler in order to find the value of $1x$ or x .

Process:

- 1) Look at what operations are acting on your variable
- 2) Undo the multiple operations that are acting on your variable

First: Undo Addition or Subtraction

Second: Undo Multiplication or Division

- 3) Find the value of $1x$
- 4) Check your answer

Solve the following 2-step equations. Use the exact same process as we did on the front page.

A) $4x + 9 = 37$

B) $-3x - 8 = 22$

C) $\frac{t}{4} + 8 = 20$

$$\begin{array}{r} 4x + 9 = 37 \\ -9 \quad -9 \\ \hline 4x = 28 \\ \frac{4x}{4} = \frac{28}{4} \\ x = 7 \end{array}$$

$$\begin{array}{l} 4(7) + 9 = 37 \\ 28 + 9 = 37 \\ 37 = 37 \\ \checkmark \end{array}$$

D) $5 + 9x = 41$

E) $\frac{x}{6} - 7 = -25$

F) $-6 + 3x = -15$

G) $-18 = 4y + 10$

H) $\frac{x}{3} + 10 = 3$

I) $-24 - a = -15$