

Get out your homework and have it ready to check. We will have a Target Check on Monday.

Classwork - Solving 2 Step Equations

$$\text{A) } x - 9 = -3$$

$$\begin{array}{r} +9 \quad +9 \\ \hline x = 6 \end{array}$$

$$\text{D) } x + 10 = -6$$

$$\begin{array}{r} -10 \quad -10 \\ \hline x = -16 \end{array}$$

$$\text{B) } 6 \cdot \frac{x}{6} = 7 \cdot 6$$

$$x = 42$$

$$\text{E) } -8x = -32$$

$$\begin{array}{r} \overline{-8} \quad \overline{-8} \\ \hline x = 4 \end{array}$$

$$\text{C) } -8x = 20$$

$$\begin{array}{r} \overline{-8} \quad \overline{-8} \\ \hline x = -2.5 \end{array}$$

$$\text{F) } 8 \cdot \frac{x}{8} = -6.75 \cdot 8$$

$$x = -54$$

Solve each equation. Check your work.

$$1. \frac{1}{2}x = 14$$

$$x = 28$$

$$2. \frac{4}{7}w = 24$$

$$w = 42$$

$$\frac{8}{3} \cdot \frac{3}{8}r = \frac{5}{2} \cdot \frac{8}{21} \cdot r = \frac{5}{2} \cdot r = 2\frac{1}{2}$$

$$4. \frac{5}{7}c = \frac{13}{14}$$

$$c = 1\frac{3}{10}$$

$$5. 0.4t = 0.72$$

$$t = 1.8$$

$$6. 1.8p = 19.8$$

$$p = 11$$

$$7. -\frac{5}{8}y = -\frac{1}{2}$$

$$y = \frac{4}{5}$$

$$8. \frac{13}{7}n = -\frac{13}{14}$$

$$n = -\frac{1}{2}$$

$$9. -5.2 = 0.04m$$

$$m = -130$$

$$10. -0.8g = 3.36$$

$$g = -4.2$$

$$11. -2h = -1.46$$

$$h = 0.73$$

$$12. -\frac{7}{9}s = -\frac{1}{3}$$

$$s = \frac{3}{7}$$

Define a variable. Then write and solve an equation for each situation.

13. **COOKING** Simone peeled 14 potatoes in  $\frac{1}{5}$  hour. At this rate, how many potatoes can Simone peel in one hour?

$$\frac{1}{5}p = 14$$

Define Variable:  $p$  = # of potatoes

$$p = 70 \text{ potatoes}$$

14. **VOTING** In the eighth grade, 322 students voted for the new mascot to be a tiger. This was  $\frac{7}{10}$  of the total number of students in the eighth grade. How many students are in the eighth grade?

$$\frac{7}{10}s = 322$$

Define Variable:  $s$  = Students in 8th

$$s = 460 \text{ students}$$

15. **BUDGETS** Rachel budgeted \$76.50 for school clothes. This is 0.45 of her total budget. How much does Rachel have in her total budget?

Define Variable: b = budget

$$0.45b = 76.50$$

$$b = \$170$$

16. **TEMPERATURE** Overnight, the temperature dropped 1.3 degrees every hour. How many hours did it take the temperature to drop 7.8 degrees?

Define Variable: h = # of hours

$$1.3h = 7.8$$

$$h = 6 \text{ hours}$$

$$-1.3h = -7.8$$

## Solving Equations

- 1) What operation(s) are acting on the variable?
- 2) How do you undo that operation? → Make sure do to this on BOTH SIDES.

### Simplifying Before Solving One-Step Equations

**Example:** Solve the equation  $-6x - 2x = 24$

$$\begin{array}{r} \textcircled{-6x} + \textcircled{-2x} = 24 \\ \downarrow \quad \downarrow \quad \downarrow \\ -8x = 24 \\ \hline -8 \quad -8 \\ \hline 1x = -3 \end{array}$$

$$1x = -3$$

or

$$x = -3$$

**Simplifying:** 1) Identify like terms by circling or boxing them  
 2) Simplify both sides of the equation by combining like terms  
*Rewrite Simplified Equation*

**Solving:** 3) Use inverse operations to undo what's acting on the variable on BOTH SIDES  
 4) Simplify the equation until you solve for x or 1x  
 5) Check your solution! →

**Check it!**

$$x = -3$$

$$-6(-3) - 2(-3) = 24$$

$$18 + 6 = 24$$

$$24 = 24$$

$x = -3$  is correct

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)  $x + 5 - 2 = 12$

$$\begin{array}{r} x + 5 = 12 \\ -3 \quad -3 \\ \hline x = 9 \end{array}$$

$x^3 = 125$

$$x = 5$$

$16 = x^2$

$$\pm 4 = x$$

$$D) \sqrt{x} = 12$$

$$x = 144$$

$$E) 4 - 7x = -30 + 3$$

$$\frac{-3x}{-3} = \frac{-27}{-3}$$

$$x = 9$$

$$F) -x - 2x = -10 - 2$$

$$\frac{-3x}{-3} = \frac{-12}{-3}$$

$$x = 4$$

Solve the equations with fractions below. Remember, you can write  $\frac{2}{3}x = \frac{2x}{3}$ . Once you do this, you can undo the division on BOTH sides, rewrite the simpler equation, then undo the division on BOTH sides to find the answer.

$$A) \frac{2}{3}x = 15$$

$$\cancel{3} \cdot \frac{2x}{\cancel{3}} = 15 \cdot 3$$

$$\cancel{2} \cdot \frac{x}{\cancel{2}} = \frac{45}{\cancel{2}}$$

$$x = 22\frac{1}{2}$$

$$\cancel{5} \cdot \frac{2}{\cancel{5}}x = -6 \cdot \frac{5}{\cancel{5}}$$

$$x = -10$$

$$C) \frac{-2}{6}x = 3$$

$$x = -9$$

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

$$x = -14$$

## Solving 2-step equations

Solving 2-step equations means we need to undo 2 operations before finding 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

$\begin{array}{r} -8x - 6 = 10 \\ +6 \quad +6 \\ \hline -8x = 16 \\ \div -8 \quad \div -8 \\ \hline 1x = -2 \\ x = -2 \end{array}$	<p><b>What operations are acting on <math>x</math>?</b></p> <p><u>1st</u> Undo <u>-6</u> by <u>+6</u> on <b>BOTH</b> sides</p> <p><u>Rewrite the new equation</u></p> <p><u>2nd</u> <math>\cdot -8</math> <math>\div -8</math> Undo <u>   </u> by <u>   </u> on <b>BOTH</b> sides</p> <p>State the value of <math>1x</math> or <math>x</math>.</p> <p>Check the answer.</p>	$\begin{array}{r} \frac{x}{3} + 5 = -2 \\ -5 \quad -5 \\ \hline \frac{x}{3} = -7 \\ \cdot 3 \quad \cdot 3 \\ \hline x = -21 \\ 1x = -21 \end{array}$	<p><b>What operations are acting on <math>x</math>?</b></p> <p><u>1st</u> Undo <u>+5</u> by <u>-5</u> on <b>BOTH</b> sides</p> <p><u>Rewrite the new equation</u></p> <p><u>2nd</u> <math>\div 3</math> <math>\cdot 3</math> Undo <u>   </u> by <u>   </u> on <b>BOTH</b> sides</p> <p>State the value of <math>1x</math> or <math>x</math>.</p> <p>Check the answer.</p>
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Solve the following 2-step equations using the exact same process as we did above.

A)  $2x + 12 = 26$   
$$\begin{array}{r} -12 \quad -12 \\ \hline 2x = 14 \\ \frac{2}{2} \quad \frac{14}{2} \\ \hline x = 7 \end{array}$$

B)  $\frac{t}{4} - 3 = 5$   
$$\begin{array}{r} +3 \quad +3 \\ \hline 4 \cdot \frac{t}{4} = 8 \cdot 4 \\ \hline t = 32 \end{array}$$

C)  $-3x - 5 = 28$   
$$\begin{array}{r} +5 \quad +5 \\ \hline -3x = 33 \\ \frac{-3}{-3} \quad \frac{33}{-3} \\ \hline x = -11 \end{array}$$

D)  $\frac{t}{2} + 1 = -4$   
$$\begin{array}{r} -1 \quad -1 \\ \hline 2 \cdot \frac{t}{2} = -5 \cdot 2 \\ \hline t = -10 \end{array}$$

E)  $-4x + 8 = 32$

F)  $3x - 6 = -12$

G)  $\frac{1}{5}t + 7 = -3$   
$$\begin{array}{r} -7 \quad -7 \\ \hline 5 \cdot \frac{1t}{5} = -10 \cdot 5 \\ \hline t = -50 \end{array}$$

H)  $-2x + 4 = -12$