

Solving One-Step Equations – Multiplication & Division (SOL 6.18 & 7.14)

- **Remember:** The **GOAL** of solving equations: _____
 - To do this you need to _____ the variable, using _____

State the INVERSE OPERATIONS

- Add 23 _____
- Subtract 18 _____
- Multiply by -15 _____
- Divide by 8 _____

Example 1: Solve $8x = 56$.

Solution:

$$8x = 56$$

$$\frac{8x}{\boxed{}} = \frac{56}{\boxed{}}$$

$$x = \underline{\hspace{2cm}}$$

Where is the variable?

What is done to it?

How can I undo that?

Apply to both sides.

Solve/Simplify

Example 2: Solve $\frac{a}{5} = 12$

Solution:

$$\frac{a}{5} = 12$$

$$\boxed{} \cdot \frac{a}{5} = 12 \cdot \boxed{}$$

$$a = \underline{\hspace{2cm}}$$

Check:

$$8x = 56$$

$$8(\underline{\hspace{1cm}}) \stackrel{?}{=} 56$$

$$\underline{\hspace{1cm}} = 56 \checkmark$$

Write original equation.

Substitute for variable.

Is it true?

Check:

$$\frac{a}{5} = 12$$

$$\frac{(\underline{\hspace{1cm}})}{5} = 12$$

$$\underline{\hspace{1cm}} = 12$$

Let's Practice!!

Solve each equation. Check your solution.

Solve	Check here:	Solve	Check here:
$3a = 18$ $a = 6$ $a = 6$	$3a = 18$ $3(6) = 18$ $18 = 18 \checkmark$	$\frac{b}{4} = 12$	
$4 = \frac{f}{3}$		$48 = 6y$	
$121 = 11a$		$\frac{g}{7} = 7$	
$9x = 45$		$32 = 8a$	
$3z = 36$		$\frac{x}{5} = 2$	
$21 = \frac{x}{3}$		$8b = 56$	

$$\frac{3}{5}t = 6 \quad \frac{3}{5} \div \frac{3}{5} = \frac{6}{1} = 6$$

Multiplicative Inverses (Reciprocals): Used to solve multiplication/division equations that contain fractions!

Find the Multiplicative Inverse, or reciprocal of: $\frac{1}{3} \rightarrow \frac{3}{1} = 3$ $\frac{5}{7} \rightarrow \frac{7}{5}$ $\frac{2}{5} \rightarrow \frac{5}{2}$

Now let's use multiplicative inverses to solve equations...

Solve $\frac{3}{5}t = 6$

The coefficient of t is $\frac{3}{5}$. The reciprocal of $\frac{3}{5}$ is $\frac{5}{3}$.

$\frac{5}{3} \cdot \frac{3}{5}t = 6 \cdot \frac{5}{3}$ Multiply each side by the Multiplicative Inverse.

$t = \frac{30}{3}$ Simplify.

$t = 10$ Solve.

Solve $\frac{2}{7}t = 8$

$t = \frac{56}{2}$

$t = 28$

$\frac{2}{7}t = 8$

$\frac{2}{7}(28) = 8$

$8 = 8 \checkmark$

Let's Practice!!

Solve each equation. Check your solution.

$\frac{1}{7}t = 3$		$\frac{4}{5}t = 8$	
$\frac{1}{9}t = 6$		$\frac{3}{5}t = 6$	
$\frac{2}{3} = \frac{3}{10}t$		$\frac{1}{4}a = \frac{4}{15}$	
$\frac{a}{9} = 11$		$\frac{h}{8} = 6$	

$\frac{3}{4}x = 9$		$\frac{5}{8}k = 25$	
$\frac{a}{6} = 8$		$7s = 49$	
$32 = 16h$		$5 = \frac{p}{5}$	
$4y = 12$		$\frac{x}{4} = 32$	
$17 + c = 41$		$\frac{2}{5}y = \frac{4}{15}$	
$10 + d = 24$		$\begin{array}{r} 8 = b - 5 \\ + 5 \quad + 5 \\ \hline 13 = b \\ b = 13 \end{array}$	$\begin{array}{l} 8 = b - 5 \\ 8 = (13) - 5 \\ 8 = 8 \checkmark \end{array}$
$14g = 56$		$112 = 8v$	
$\frac{t}{12} = 11$		$\frac{f}{11} = 12$	