

## Warm Up

9/15

Solve for x:

$$5x - 4 + 2x = 10x + 15 + 2$$

$$7x - 4 = 10x + 17$$

$$\begin{array}{r} -17 \\ \hline \end{array}$$

$$7x - 21 = 10x$$

$$\begin{array}{r} -7x \\ \hline \end{array}$$

$$\frac{-21}{3} = \frac{3x}{3}$$

$$\boxed{-7 = x}$$

# Solving Equations with Variables on Both Sides.

Date \_\_\_\_\_

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Solve each equation.

1)  $7 + 5r + 3 + 5 = 1 + 7r$

2)  $-4 + 6k + 8k = -4 - 7k$

$$\begin{array}{r} -4 + 14k = -4 - 7k \\ +4 \qquad \qquad +4 \\ \hline 14k = -7k \\ +7k \quad +7k \\ \hline \end{array}$$

3)  $8n - 7 = 7n - 14$

4)  $-7b - 14 = -5b - 4b$

$$\begin{array}{r} 21k = 0 \\ \hline 21 \quad 21 \\ \hline k = 0 \end{array}$$

5)  $8 + 7n = 6n + 2n$

6)  $2 - 2n - 2n = -5 - 3n$

7)  $7x = 3x + 4x$

$$\begin{array}{r} 7x = 7x \\ \hline 7 \quad 7 \\ \hline x = x \end{array}$$

$$\begin{array}{r} x = x \\ -x \quad -x \\ \hline 0 = 0 \end{array}$$

infinite solutions

8)  $4 + 7x = 8x - 2x$

9)  $2 + 7n = -4 + 5n$

10)  $-7 - 3a = 1 - 4a$

## Homework Questions?

9)  $2 + 7n = -4 + 5n$

$$\begin{array}{r} -2 \quad -2 \\ \hline \end{array}$$

$$7n = -6 + 5n$$

$$\begin{array}{r} -5n \quad -5n \\ \hline \end{array}$$

$$\frac{2n}{2} = \frac{-6}{2}$$

$$n = -3$$

What about this? What's different?

$$2(3x - 5) = 8$$

$$\begin{array}{r} 6x - 10 = 8 \\ + 10 \quad + 10 \\ \hline \end{array}$$

$$\begin{array}{r} 6x = 18 \\ \underline{6} \quad \underline{6} \end{array}$$

$$x = 3$$

$$2(3x - 5) = 8$$

$$\begin{array}{r} 6x - 10 = 8 \\ - 8 \quad - 8 \\ \hline \end{array}$$

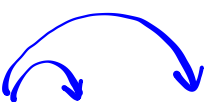
$$\begin{array}{r} 6x - 18 = 0 \\ + 18 \quad + 18 \\ \hline \end{array}$$

$$\begin{array}{r} 6x = 18 \\ \underline{6} \quad \underline{6} \end{array}$$

$$x = 3$$

It doesn't matter how you solve the problem, as long as you do the **same thing to both sides every time!**

Make sure all numbers and variables are **free** before applying any properties of equality.


$$2(3x - 5) = 8$$

$$6x - 10 = 8$$

Distributive  
Property

Free!



How to check your work:

$$2(3(3)-5) \stackrel{?}{=} 8$$

$$2(9-5) \stackrel{?}{=} 8$$

$$2(4) \stackrel{?}{=} 8$$

$$8 = 8 \checkmark$$

$$x=3$$



This is  
correct!



Practice:

1.

$$18 = 3(3x - 6)$$

$$18 = 9x - 18$$

$$\begin{array}{r} + 18 \qquad \qquad + 18 \\ \hline \end{array}$$

$$\frac{36}{9} = \frac{9x}{9}$$

$$\boxed{4 = x}$$

Finish up the practice worksheet.

Procedure for solving for x:

- "Free up" all numbers and variables.  
(Remove parenthesis by using the distributive property.)
- Combine like terms (if any) on each side.
- Use properties of equality to isolate x.

Don't forget to:

- Show all work
- Use transformation lines.



# Homework

Finish classwork.