8th Grade Math

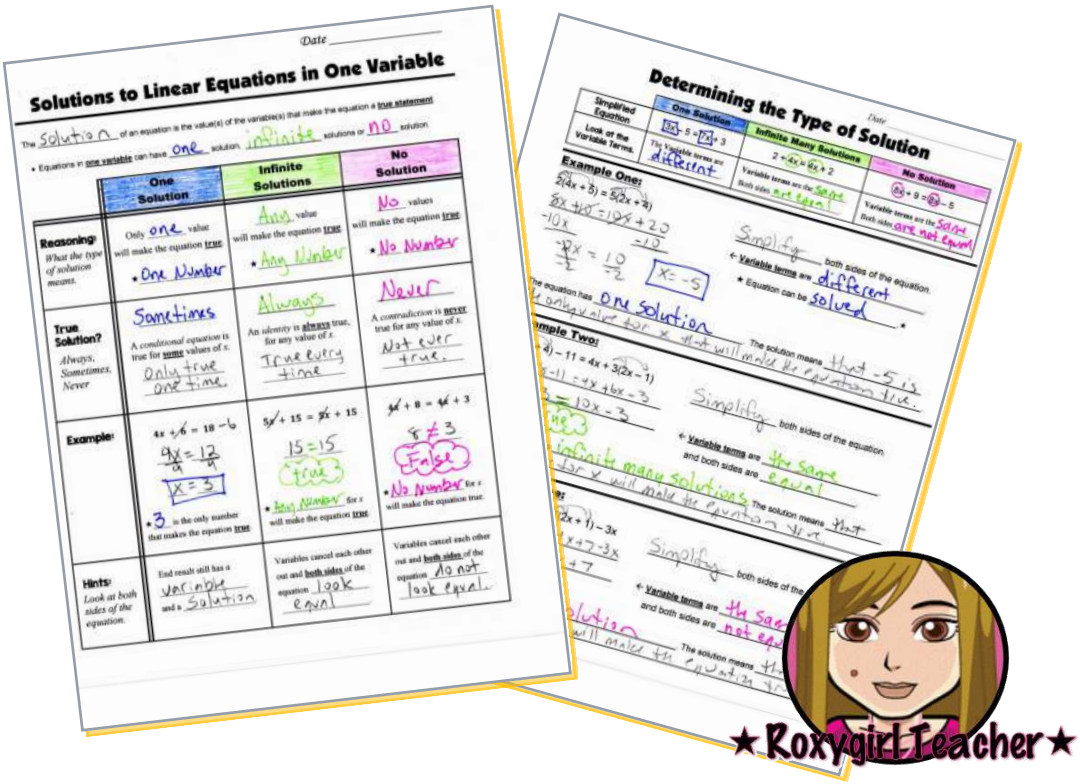
Guided Notes

Solutions to Equations in One Variable

One Solution, Infinite Many Solutions, No Solution

Two Guided Color-coded

Interactive Math Notebook Pages



Date _____

Solutions to Linear Equations in One Variable

The _____ of an equation is the value(s) of the variable(s) that make the equation a **true statement**.

- Equations in **one variable** can have _____ solution, _____ solutions or _____ solution.

	One Solution	Infinite Solutions	No Solution
Reasoning: *What the type of solution means.*	Only _____ value will make the equation **true**. ★_____ _____	_____ value will make the equation **true**. ★_____ _____	_____ values will make the equation **true**. ★_____ _____
True Solution? *Always, Sometimes, Never*	_____ A *conditional equation* is true for **some** values of *x*. _____ _____	_____ An *identity* is **always** true, for any value of *x*. _____ _____	_____ A *contradiction* is **never** true for any value of *x*. _____ _____
Example: .	$4x + 6 = 18$ _____ _____ ____ ____ ★____ is the only number that makes the equation **true**.	$5x + 15 = 5x + 15$ _____ _____ ★_____ _____ for *x* will make the equation **true**.	$4x + 8 = 4x + 3$ _____ _____ ★_____ _____ for *x* will make the equation true.
Hints: *Look at both sides of the equation.*	End result still has a _____ and a _____.	Variables cancel each other out and **both sides** of the equation _____ _____.	Variables cancel each other out and **both sides** of the equation _____ _____.

Date _____

Determining the Type of Solution

	One Solution	Infinite Many Solutions	No Solution
Simplified Equation	$3x - 5 = 7x + 3$	$2 + 4x = 4x + 2$	$8x + 9 = 8x - 5$
Look at the Variable Terms.	The **variable terms** are _____.	**Variable terms** are the_____. Both sides _____.	**Variable terms** are the_____. Both sides_____.

Example One:

$2(4x + 5) = 5(2x + 4)$

_____

_____ both sides of the equation.

← **Variable terms** are _____.

★ Equation can be _____.★

The equation has _____. The solution means _____

_____.

Example Two:

$2(5x + 4) - 11 = 4x + 3(2x - 1)$

_____

_____ both sides of the equation.

_____

← **Variable terms** are _____.

and both sides are _____.

The equation has _____. The solution means _____

_____.

Example Three:

$-4x + 3(5x + 6) = 7(2x + 1) - 3x$

_____

_____ both sides of the equation.

_____

← **Variable terms** are _____.

and both sides are _____.

The equation has _____. The solution means _____

_____.

Date _____

Solutions to Linear Equations in One Variable

The Solution of an equation is the value(s) of the variable(s) that make the equation a **true statement**.

- Equations in **one variable** can have one solution, infinite solutions or no solution.

	One Solution	Infinite Solutions	No Solution
Reasoning: *What the type of solution means.*	Only one value will make the equation **true**. ★ One Number	Any value will make the equation **true**. ★ Any Number	No values will make the equation **true**. ★ No Number
True Solution? *Always, Sometimes, Never*	Sometimes A *conditional equation* is true for **some** values of x. Only true one time.	Always An *identity* is **always** true, for any value of x. True every time	Never A *contradiction* is **never** true for any value of x. Not ever true.
Example:	$4x + 6 = 18 - 6$ $\frac{4x}{4} = \frac{12}{4}$ $x = 3$ ★ 3 is the only number that makes the equation **true**.	$5x + 15 = 5x + 15$ $15 = 15$ true ★ Any Number for x will make the equation **true**.	$4x + 8 = 4x + 3$ $8 \neq 3$ False ★ No Number for x will make the equation true.
Hints: *Look at both sides of the equation.*	End result still has a variable and a Solution.	Variables cancel each other out and **both sides** of the equation look equal.	Variables cancel each other out and **both sides** of the equation do not look equal.

Date _____

Determining the Type of Solution

	One Solution	Infinite Many Solutions	No Solution
Simplified Equation	$3x - 5 = 7x + 3$	$2 + 4x = 4x + 2$	$8x + 9 = 8x - 5$
Look at the Variable Terms.	The **Variable terms** are different.	**Variable terms** are the same. Both sides are equal.	**Variable terms** are the same. Both sides are not equal.

Example One:

$2(4x + 5) = 5(2x + 4)$

$8x + 10 = 10x + 20$

$-10x \quad -10$

$-2x = 10$

$\frac{-2x}{-2} = \frac{10}{-2}$

$x = -5$

Simplify both sides of the equation.

← **Variable terms** are different.

★ Equation can be solved. ★

The equation has one solution. The solution means that -5 is the only value for x that will make the equation true.

Example Two:

$2(5x + 4) - 11 = 4x + 3(2x - 1)$

$10x + 8 - 11 = 4x + 6x - 3$

$10x - 3 = 10x - 3$

true

Simplify both sides of the equation.

← **Variable terms** are the same and both sides are equal.

The equation has infinite many solutions. The solution means that any value for x will make the equation true.

Example Three:

$-4x + 3(5x + 6) = 7(2x + 1) - 3x$

$-4x + 15x + 18 = 14x + 7 - 3x$

$11x + 18 \neq 11x + 7$

false

Simplify both sides of the equation.

← **Variable terms** are the same and both sides are not equal.

The equation has no solution. The solution means that no value for x will make the equation true.

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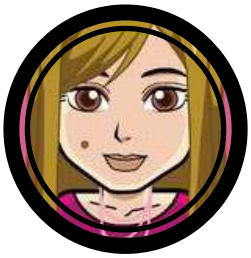

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