

Name: \_\_\_\_\_ Date: \_\_\_\_\_ UNIT 1 CLASS WORK

★ Solving Equations: Special Cases ★

🔗 **Objective:** You will be able to identify whether an equation has no solution, infinitely many solutions, or just one solution, and explain why.

🔗 **With a partner...** Try isolating "x" in the equation  $3(x-9) = 3x + 6$

$$\begin{aligned} 3x - 6 &= 3x + 6 \\ -3x & \quad -3x \\ -6 &= 6 \end{aligned}$$

What happens?!

variable disappears

What do you think this means?!

$-6 \neq 6$   
So... no solution

🔗 **Another example...**

$$\begin{aligned} 4(x-5) &= 4x - 20 \\ -4x & \quad -4x \\ -20 &= -20 \end{aligned}$$

What happens?!

variable disappears

What do you think this means?!

$-20 = -20$  is true  
So... infinite solutions (IR)

★ THE THREE CASES OF EQUATIONS...

	Case 1	Case 2	Case 3
Looks like:	1 solution $x = \text{any \#}$	$a \neq a$ different $3 = 2$	$a = a$ itself $5 = 5$
Meaning:	$x = 3$ because... $x$ is isolated	No Solution always false because...	infinite solutions always true because...
Example:	$2(x-1) - 2 = 8$ $2x - 2 - 2 = 8$ $2x - 4 = 8$ $2x = 12$ $x = 6$	$5x + 10 = 5(x-3)$ $5x + 10 = 5x - 15$ $10 \neq -15$ <u>no solution</u>	$3(x-1) = 2x - 3 + x$ $3x - 3 = 3x - 3$ $-3x = -3x$ $-3 = -3$ <u>TRUE</u> (IR)

🔗 **Practice with a partner:** Check the appropriate box for each equation

	Has one solution	Has infinite solutions	Has no solution
1. $2(x-9) = 2x + 18$	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2. $12(x-3) = 11x + 3$	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. $8(x+6) = 6x + 40 + 2x + 8$	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
4. $2x - (x+9) = -7x + 2 + 8x$	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

🔗 **Practice on your own:**

**Part A:** Label each equation as having one solution, infinite solutions, or no solutions.

5.  $4x + 5(x-1) = 9x - 5$

6.  $x + 2x + 18 = 3(x+6)$

7.  $2(x-2) = 2(x+4) - 3$

IR

IR

No Sol.

**Part B:** 8. Can you create an equation that has infinitely many solutions? Explain your thought process.

9. Can you create an equation that has no solution? Explain your thought process.

**Part C:** In the first box on your exit slip page, write and solve the equation:  $6(x-4) = 6x + 20$   
Also write any questions you have for us about this topic. ☺