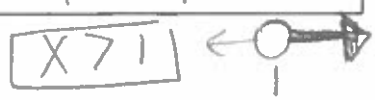
Name Teacher Pd _____ Date _____ **Section 1.R.3**

Solving Equations and Inequalities

Equation	Steps	Inequality
The sum of three times a number and five is fourteen. $3x + 5 = 14$ $-5 \quad -5$ $\frac{3x}{3} = \frac{9}{3}$ $x = 3$	**For Two-Step Solutions** After translating, 1) subtract (or add) 2) divide (or mult.) For inequalities, graph solutions. Open: $<, >$ Closed: $\leq, \geq$	The difference of twice a number and three is less than seven. $2x - 3 < 7$ $+3 \quad +3$ $\frac{2x}{2} < \frac{10}{2}$ $x < 5$ 
$-4(2x + 1) - 4x = 8$ $-8x - 4 - 4x = 8$ $-12x - 4 = 8$ $+4 \quad +4$ $\frac{-12x}{-12} = \frac{12}{-12}$ $x = -1$	**For Multi-Step Solutions** What must you do FIRST? simplify < distrib, combine like terms What type of operations do you use to isolate the variable? inverse For inequalities, what happens when you multiply or divide by a negative number? reverse the symbol	$3(t-1) - 4t \geq -5$ $3t - 3 - 4t \geq -5$ $-1t - 3 \geq -5$ $+3 \quad +3$ $\frac{-1t}{-1} \geq \frac{-2}{-1}$ $t \leq 2$ 
The sum of four times a number and three is the same as the difference of two times a number and eleven. $4x + 3 = 2x - 11$ $-2x \quad -2x$ $2x + 3 = -11$ $-3 \quad -3$ $\frac{2x}{2} = \frac{-14}{2}$ $x = -7$	**For Variables on Both Sides** How do we get all the variables to the same side? 1) get rid of the variables on 1 side 2) do the same to the other side	The difference of five times a number and one is greater than double the sum of a negative number and three. $5x - 1 > 2(-x + 3)$ $5x - 1 > -2x + 6$ $+2x \quad +2x$ $7x - 1 > 6$ $+1 \quad +1$ $\frac{7x}{7} > \frac{7}{7}$ $x > 1$ 

Special Solutions - How many solutions does the equation have?

1) $2(k-3)-k=1+k-7$

$2k-6-k=1+k-7$

$k-6=-6+k$

$-k \quad -k$

$-6=-6$ True!

infinitely many solutions

2) $5t+1=5(t-1)+3$

$5t+1=5t-5+3$

$5t+1=5t-2$

$-5t \quad -5t$

$1=-2$ False!

no solution

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

$6x-15=x+5x+15$

$6x-15=6x+15$

$-6x \quad -6x$

$-15=15$ False!

no solution

4) $m+3=3(2m+1)-5m$

$m+3=6m+3-5m$

$m+3=m+3$

$-m \quad -m$

$3=3$ True!

infinitely many solutions

Key Ideas:

- Identities (true statements) have infinitely many solutions.
- False statements have no solution.