

## WARM UP:

$$\begin{array}{r}
 1. \quad 15x - 18 = 11x + 18 \\
 \hline
 -11x \quad -11x \\
 \hline
 4x - 18 = 18 \\
 +18 \quad +18 \\
 \hline
 4x = 36 \\
 \frac{4x}{4} = \frac{36}{4} \\
 \boxed{x = 9}
 \end{array}$$

$$\begin{array}{r}
 2. \quad 6x + 21 = 8x + 13 \\
 \hline
 -6x \quad -6x \\
 \hline
 21 = 2x + 13 \\
 -13 \quad -13 \\
 \hline
 8 = 2x \\
 \frac{8}{2} = \frac{2x}{2} \\
 \boxed{4 = x}
 \end{array}$$

Solve each equation.

$$\begin{array}{r}
 \text{Ex. 1: } 4(x-3) + 10 = 2(2x-1) \\
 \hline
 4x - 12 + 10 = 4x - 2 \\
 \hline
 4x - 2 = 4x - 2 \\
 \hline
 -4x \quad -4x \\
 \hline
 -2 = -2 \quad \text{True}
 \end{array}$$

$\infty$  many  
All  $\mathbb{R}$

\*when all the x's cancel out\*

$$\begin{array}{r}
 \text{Ex. 2: } 6(4-2x) = 3(3-5x) + 3x \\
 \hline
 24 - 12x = 9 - 15x + 3x \\
 \hline
 24 - 12x = 9 - 12x \\
 \hline
 +12x \quad +12x \\
 \hline
 \text{False } 24 = 9
 \end{array}$$

NO SOLUTION

How do you know it is a special case?

\*the coefficients are the same on BOTH sides.

How can you tell which special case it is?

If you have EXACTLY the same thing on both sides  
 $\rightarrow \infty$  many  
 No solution  $\rightarrow$  same coeff. Different constant

## Interesting Possibilities with Inequalities

$$3(x+9) = 3x + 27$$

$$\underline{3x + 27} = \underline{3x + 27}$$

$\infty$  many

$$3(x+9) > 3x + 27$$

$$\underline{3x + 27} > \underline{3x + 27}$$

NO SOLUTION

$$3(x+9) \geq 3x + 27$$

$$3x + 27 \geq 3x + 27$$

True

$\infty$  many

$\infty$

$$3(x+5) < 3x + 27$$

$$\underline{3x + 15} < \underline{3x + 27}$$

$$\begin{array}{r} -3x \\ \hline 15 < 27 \end{array}$$

$\infty$  many

$x = \underline{\quad}$

$$3(x+5) \geq 3x + 27$$

$$\underline{3x + 15} \geq \underline{3x + 27}$$

False

NO SOLUTION