# UNIT 2: EQUATIONS & INEQUALITIES

## ONE SOLUTION, NO SOLUTION AND ALL REAL NUMBERS

**Objectives:** I can solve multi- step equations with variables on both sides with the distributive property and Identify equations with no solution or all real numbers.

### Examples:

**1.** $4(2n + 5) = 3n + 10$

$8n + (-20) = 3n + 10$

$-3n \quad -3n$

$5n + (-20) = 10$
$\quad +20 \quad +20$

$\dfrac{5n}{5} = \dfrac{30}{5}$

**One solution**
$n = 6$

Check
$4[2(6) + (-5)] = 3(6) + 10$
$4(12 + (-5)) = 18 + 10$
$4(7) = 28$
$28 = 28$ ✓

**2.** $2(4x + 7) - 10 = 3x + 5x$

$8x + 14 + 10 = 8x$

$8x + 4 = 8x$
$-8x \quad -8x$

$4 = 0$ **False**
**No Solution**

**3.** $2(4x + 7) + 2x = 8x + 14$

$8x + 14 + 2x = 8x + 14$

$10x + 14 = 8x + 14$
$-8x \qquad -8x$

$2x + 0 = 14$
$\quad -14 \;\; -14$

$\dfrac{2x}{2} = \dfrac{0}{2}$

**One solution**
$x = 0$

If you get a **FALSE** statement...like 5=2, then no solution would satisfy the equation...write **NO SOLUTION**

If you get a **TRUE** statement...like 5=5, then all real numbers would satisfy the equation...write **ALL REAL #'s**

### Practice:

**1.** $8(k + 3) = 12k - 4$

$8k + 24 = 12k - 4$
$-8k \qquad -8k$

$24 = 4k - 4$
$+4 \qquad +4$

$\dfrac{28}{4} = \dfrac{4k}{4}$

$7 = k$

**2.** $-3(5 + 9c) = 25 + 27c$

$-15 + 27c = 25 + 27c$
$\quad -27c \qquad -27c$

$-15 = 25$

**False**
**No Solution**

**3.** $6x + 5 = 5(3x + 1) - 9x$

$6x + 5 = 15x + 5 + (-9x)$

$6x + 5 = 6x + 5$
$-6x \qquad -6x$

$5 = 5$ **All Real Numbers**
TRUE

**4.** $5 - 11t = 7(5 + 2t)$

$5 + 11t = 35 + (-14t)$
$+14t \qquad +14t$

$5 + 3t = 35$
$-5 \qquad -5$

$\dfrac{3t}{3} = \dfrac{30}{3}$

$t = 10$

**5.** $-2(18 + 3y) = 7y + 2y$

$-36 + 6y = 9y$
$-6y \quad -6y$

$\dfrac{-36}{3} = \dfrac{3y}{3}$

$-12 = y$

**6.** $2(4a + 12) = 6a + 1$

$8a + (-24) = 6a + 1$
$-6a \qquad -6a$

$2a + (-24) = 1$
$\quad +24 \;\; +24$

$\dfrac{2a}{2} = \dfrac{25}{2}$

$a = \dfrac{25}{2}$ or $12.5$