Notes 1-5

Int 2 **Multi-Step Equations w/Variables on Both Sides** **Unit 1**

Warm-up:

Solve.

1. $15(20+d)=420$

$300+15d=420$

$-300 \quad -300$

$15d=120$

$\frac{15d}{15}=\frac{120}{15}$

$d=8$

2. $8x-35-3x=25$

$5x-35=25$

$+35 \quad +35$

$5x=60$

$\frac{5x}{5}=\frac{60}{5}$

$x=12$

Steps for Solving Multi-Step Equations:

1. Distributive Property - if needed.
2. Combine Like Terms
   - ↳ SAME side of the equal sign (=)
3. If there are variables on BOTH sides of the =, pick the smaller or one & move it by inverse operations.
4. Solve!

Solve each equation or inequality.

Ex. 1: $5x-4=3x+8$

$-3x \quad -3x$

$2x-4=8$

$+4 \quad +4$

$2x=12$

$x=6$

Solve each equation.

Ex. 2: $8+4d=5d$

$-4d \quad -4d$

$8 = d$

$8+4(8) = 5(8)$

$8+32 = 40$ ✓

Ex. 3: $\frac{2}{3}x - 1 > 9 - \frac{1}{6}x$

$+\frac{1}{6}x \qquad +\frac{1}{6}x$

$2\cdot\frac{2}{3}x + \frac{1}{6}x - 1 > 9$

$\frac{4}{6}x + \frac{1}{6}x$

$\frac{5}{6}x - 1 > 9$

$+1 \qquad +1$

$\frac{6}{5}\cdot\frac{5}{6}x > 10\cdot\frac{6}{5}$

$x > 12$

Ex. 4: $-g+2(3+g) \leq -4(g+1)$

$-1g + 6 + 2g \leq -4g - 4$

$1g + 6 \leq -4g - 4$

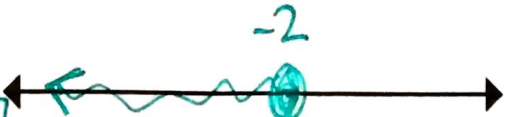
$+4g \qquad +4g$

$5g + 6 \leq -4$

$-6 \qquad -6$

$\frac{5g}{5} \leq \frac{-10}{5}$

$g \leq -2$



Solve each equation.

Ex. 5: $6(x-3)+10=2(3x-4)$

$6x-18+10=6x-8$

$6x-8=6x-8$

$-6x \quad -6x$

$-8=-8$

Identity or Infinitely Many Solutions: ∞ many

$6x-8=6x-8$

$-8=-8$ True

Ex. 6: $8(4-2x)=4(3-5x)+4x$

$32-16x=12-20x+4x$

$32-16x=12-16x$

$+16x \quad +16x$

$32=12$

Null Set or No Solution: no # that would ever work to plug in.

Ex. 7 Billy and Jane both have lemonade stands where **x** represents the number of glasses of lemonade they have sold. Billy's profit can be represented by the expression **0.5x -4**. Jane's profit can be represented by the expression **0.75x -10**. How many glasses of lemonade would they have to sell in order to have the same profit?

$0.5x - 4 = 0.75x - 10$

$-.50x \quad -.50x$

$-4 = 0.25x - 10$

$+10 \quad +10$

$6 = 0.25x$

$\frac{6}{0.25} = \frac{0.25x}{0.25}$

$24 = x$

24 glasses