

## Notes 1-5

Int 2

Multi-Step Equations w/Variables on Both Sides

Unit 1

Warm-up:

Solve.

$$\begin{array}{r}
 1. \quad 15(20 + d) = 420 \\
 \begin{array}{r}
 \cancel{300} + 15d = 420 \\
 \hline
 15d = 120 \\
 \frac{15d}{15} = \frac{120}{15} \\
 \boxed{d = 8}
 \end{array}
 \end{array}$$

$$\begin{array}{r}
 2. \quad \underline{8x} - 35 - \underline{3x} = 25 \\
 \begin{array}{r}
 5x - \cancel{35} = 25 \\
 \hline
 5x = 60 \\
 \frac{5x}{5} = \frac{60}{5} \\
 \boxed{x = 12}
 \end{array}
 \end{array}$$

Steps for Solving Multi-Step Equations:

1. Distributive Property - if needed.
2. Combine Like Terms  
 $\rightarrow$  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.**

$$\begin{array}{r}
 \text{Ex. 1: } \underline{5x} - 4 = \underline{3x} + 8 \\
 \begin{array}{r}
 \cancel{-3x} \quad \quad \quad \cancel{-3x} \\
 \hline
 2x - 4 = 8 \\
 \underline{\quad +4 \quad +4} \\
 2x = 12
 \end{array}
 \end{array}$$

$$\boxed{x = 6}$$

Solve each equation.


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

$$\begin{array}{r} 8 + 4d = 5d \\ -4d \quad -4d \\ \hline 8 = d \end{array}$$

$$\begin{aligned} 8 + 4(8) &= 5(8) \\ 8 + 32 &= 40 \checkmark \end{aligned}$$

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

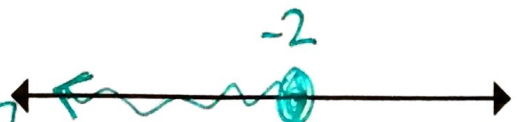
$$\begin{array}{r} \frac{2}{3}x - 1 > 9 - \frac{1}{6}x \\ +\frac{1}{6}x \quad +\frac{1}{6}x \\ \hline \frac{2}{3}x + \frac{1}{6}x - 1 > 9 \\ \frac{4}{6}x + \frac{1}{6}x - 1 > 9 \\ \frac{5}{6}x - 1 > 9 \end{array}$$

$$\begin{array}{r} \frac{5}{6}x - 1 > 9 \\ +1 \quad +1 \\ \hline \frac{5}{6}x > 10 \\ \frac{6}{5} \cdot \frac{5}{6}x > \frac{10}{1} \cdot \frac{6}{5} \\ x > 12 \end{array}$$


A number line with an open circle at 12 and an arrow pointing to the right, representing the inequality  $x > 12$ .

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

$$\begin{array}{r} -g + 6 + 2g \leq -4g - 4 \\ 1g + 6 \leq -4g - 4 \\ +4g \quad +4g \\ \hline 5g + 6 \leq -4 \\ -6 \quad -6 \\ \hline 5g \leq -10 \\ \frac{5g}{5} \leq \frac{-10}{5} \\ g \leq -2 \end{array}$$



Solve each equation.

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

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

$$\cancel{6x} - 8 = \cancel{6x} - 8$$

$$-8 = -8$$

Identity or Infinitely Many Solutions:

$\infty$  many

$$6x - 8 = 6x - 8$$

$$-8 = -8 \text{ True}$$

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

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

$$32 - \cancel{16x} = 12 - \cancel{16x}$$

$$32 = 12$$

Null Set or No Solution:

no # that would ever work to plugin.

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Int 2

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Unit 1

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?

$$\begin{array}{r} \cancel{0.5x} - 4 = \cancel{0.75x} - 10 \\ - \cancel{.50x} \qquad \qquad \qquad - \cancel{.50x} \end{array}$$

$$\begin{array}{r} -4 = 0.25x - 10 \\ +10 \qquad \qquad \qquad +10 \end{array}$$

$$\begin{array}{r} 6 = 0.25x \\ \hline 0.25 \qquad \qquad \qquad 0.25 \end{array}$$

$$\begin{array}{r} 24 = x \\ \text{glasses} \end{array}$$