

Multi-Step Equations

Solving Multi-Step Equations:

1) Always remove parentheses by distributing

2) Combine like terms

3) Use inverse operations to isolate the variable

4) Divide by the number with the variable

Ex 1: $64 = 4x + 4(4x - 4)$ ① Distribute

$$64 = \underline{4x} + \underline{16x} - 16$$
 ② Combine like terms

$$\begin{array}{r} 64 = 20x - 16 \\ +16 \quad +16 \\ \hline \end{array}$$
 ③ Inverse Operations

$$\begin{array}{r} 80 = 20x \\ \hline 20 \quad 20 \end{array}$$
 ④ Divide

$$\boxed{x = 4}$$

check!

$$64 = 4(4) + 4(4(4) - 4)$$

$$64 = 16 + 4(16 - 4)$$

$$64 = 16 + 4(12)$$

$$64 = 16 + 48$$

$$64 = 64 \quad \checkmark$$

$$\text{Ex 2: } -43 = \boxed{-3}(1-4x) - 2x$$

$$-43 = -3 + \underline{12x} - \underline{2x}$$

$$\begin{array}{r} -43 = -3 + 10x \\ +3 \quad +3 \\ \hline \end{array}$$

$$\begin{array}{r} -40 = 10x \\ \hline 10 \quad 10 \end{array}$$

$$\boxed{x = -4}$$

$$\text{Ex 3: } \boxed{-2}(x-3) + 5 = 3$$

$$-2x + \underline{6} + \underline{5} = 3$$

$$-2x + 11 = 3$$

$$\begin{array}{r} -2x + 11 \\ -11 \quad -11 \\ \hline \end{array}$$

$$\begin{array}{r} -2x = -8 \\ \hline -2 \quad -2 \end{array}$$

$$\boxed{x = 4}$$