

3.3 Solving Linear Equations in One Variable**3.3 Objective A: Solve Linear Equations Using the Addition and Multiplication Properties.**

Definitions:

1. Linear equations in one variable or one -degree equations in one variable.

Examples:

Ex. 1. Solve each equation.

a. $19 - 3x = 14 + 2x$

$$\begin{array}{r}
 \cancel{+3x} \quad \quad \quad \cancel{+3x} \\
 19 = 14 + 5x \\
 \underline{-14} \quad \quad \underline{-14} \\
 5 = 5x \\
 \div 5 \quad \quad \div 5 \\
 \boxed{1 = x}
 \end{array}$$

$$\begin{array}{l}
 -x = \# \\
 \# = -x
 \end{array}$$

$$\begin{array}{l}
 19 - 3(1) = 14 + 2(1) \\
 19 - 3 = 14 + 2 \\
 16 = 16 \checkmark
 \end{array}$$

b. $x + 20 + 2x = -10 - 2x - 15$

$$\begin{array}{r}
 \cancel{3x} + 20 = \cancel{-25} - 2x - 15 \\
 \underline{\quad +25} \quad \quad \underline{\quad +25} \\
 3x + 45 = -2x - 15 \\
 \underline{-3x} \quad \quad \underline{-3x} \\
 45 = -5x \\
 \div -5 \quad \quad \div -5 \\
 \boxed{x = -9}
 \end{array}$$

3.3 Objective B: Solve Linear Equations Containing Parentheses.**Ex. 2.** Solve each equation.

a. $3(x - 1) - 12 = 0$

$$\begin{array}{r}
 3x - 3 - 12 = 0 \\
 3x - 15 = 0 \\
 \underline{\quad +15} \quad \underline{\quad +15} \\
 3x = 15 \\
 \div 3 \quad \quad \div 3 \quad \quad \boxed{x = 5}
 \end{array}$$

b. $3(5c + 1) - 12 = 13c + 3$

$$\begin{array}{r}
 15c + 3 - 12 = 13c + 3 \\
 15c - 9 = 13c + 3 \\
 \boxed{c = 6}
 \end{array}$$

c. $-20 - (-50) = \frac{x}{9}$

$$\begin{array}{r}
 30 = \frac{x}{9} \\
 \boxed{270 = x}
 \end{array}$$

d. $-10(x + 3) + 28 = -16 - 16$

$$\begin{array}{r}
 -10x + (-30) + 28 = -32 \\
 -10x - 2 = -32 \\
 \underline{\quad +2} \quad \underline{\quad +2} \\
 -10x = -30 \\
 \div -10 \quad \quad \div -10 \\
 \boxed{x = 3}
 \end{array}$$

3.3 Objective C: Write Numerical Sentences as Equations.

Key Words or Phrases	Examples	Symbols
Equals	3 equals 2 plus 1	$3 = 2 + 1$
Gives	The quotient of 10 and -5 gives -2	$\frac{10}{-5} = -2$
Is/was	17 minus 12 is 5	$17 - 12 = 5$
Yields	11 plus 2 yields 13	$11 + 2 = 13$
Amounts to	Twice -15 amounts to -30	$2(-15) = -30$
Is equal to	-24 is equal to 2 times -12	$-24 = 2(-12)$

Ex. 3. Write each sentence as an equation.

- a. The sum of -42 and 16 is -26. $-42 + 16 = -26$
- b. The product of -5 and -29 gives 145. $-5(-29) = 145$
- c. Three times the difference of -14 and 2 amounts to -48. $3(-14 - 2) = -48$
- d. The quotient of 100 and twice 50 is equal to 1. $\frac{100}{2(50)} = 1$

Group Review: pg. 190 #30, 32, 42, 44, 60, 66, 68, 70, 72