3.1: Solve One-Step Equations

- **Be able to use inverse operations to isolate the variable and solve one-step equations**

Ex: $\dfrac{2}{7}n = -5$

$\dfrac{7}{2} \cdot \dfrac{2}{7}n = -5 \cdot \dfrac{7}{2}$

$n = -17\dfrac{1}{2}$

Ex: $-5 + x = -4$

$\underline{+5 \qquad +5}$

$x = 1$

Ex: $1 - x = -2$

$\underline{-1 \qquad -1}$

$-x = -3$

$x = 3$

Ex: $\underline{-4x} = \underline{-16}$
  $-4 \qquad -4$

$x = 4$

Ex: $2 \cdot \dfrac{x}{2} = -4 \cdot 2$

$x = -8$

Ex: $x - 10 = -3$

$\underline{+10 \quad +10}$

$x = 7$

Ex: $\underline{9x} = \underline{3}$
  $9 \quad 9$

$x = \dfrac{1}{3}$

Ex: $\underline{4x} = \underline{7}$
  $4 \quad 4$

$x = \dfrac{7}{4}$

Ex: $\underline{-2x} = \underline{5}$
  $-2 \quad -2$

$x = -\dfrac{5}{2}$

**These answers should be left as reduced improper fractions.

3.2/3.3: Solve 2/Multi-Step Equations

- **Be able to use inverse operations and reverse PEMDAS to solve multi-step equations**

Ex: $4w + 2w = 24$

$$6w = 24$$
$$\frac{6w}{6} = \frac{24}{6}$$
$$w = 4$$

Ex: $\dfrac{x}{2} + 5 = 11$

$$\underline{-5 \quad -5}$$
$$\frac{x}{2} = 6$$
$$x = 12$$

Ex: $-4x + 5 = 21$

$$\underline{-5 \quad -5}$$
$$\underline{-4x = 16}$$
$$-4 \quad -4$$
$$x = -4$$

Ex: $2x + 7 = 5$

$$\underline{-7 \quad -7}$$
$$\underline{2x = -2}$$
$$2 \quad 2$$
$$x = -1$$

Ex: $5x + 4(3 - x) = 17$

$$5x + 12 - 4x = 17$$
$$x + 12 = 17$$
$$x = 5$$

Ex: $-4 = 2(x - 2) - 3(1 - x)$

Rewrite first as: $-4 = 2(x - 2) + -3(1 + -x)$

$$-4 = 2x - 4 + -3 + 3x \qquad \text{(Distribute)}$$

$$-4 = 5x - 7 \qquad \text{(Combine)}$$
$$\underline{+7 \qquad +7}$$
$$\underline{3 = 5x}$$
$$5 \quad 5$$

$$x = \frac{3}{5}$$

- **Be able to write and solve an equation to model real-world situations.**

Ex: To join a local gym you must pay a one-time membership fee of $50. Each month you go you must also pay a monthly fee of $15. One gym member paid a total of $125. Write and solve an equation to determine the number of months this member attended the gym. Be sure to identify a variable and what it represents.

$x = \#$ months

$$125 = 15x + 50$$
$$\underline{-50 \qquad -50}$$
$$\underline{75 = 15x}$$
$$15 \quad 15$$
$$5 = x$$