

## Trimester 2 Review Sheet

### Solving Equations

In order to solve equations, we need to find the value of the variable by isolating the variable (getting the variable by itself on one side of the equal sign).

#### Remember:

- Addition and subtracting undo each other. When undoing using addition and subtraction, the goal is to get 0.
- Multiplication and division undo each other. When undoing using multiplication and division, the goal is to get 1.

#### Solving Equations with Integers

##### Examples:

$$\begin{array}{r} 1. \quad n + (-1) = -5 \\ \quad \quad \cancel{-(-1)} \quad \cancel{-(-1)} \\ \hline \boxed{n = -4} \end{array}$$

$$\begin{array}{r} 2. \quad \cancel{-4}x = 28 \\ \quad \quad \cancel{-4} \quad \cancel{-4} \\ \hline \boxed{x = -7} \end{array}$$

$$\begin{array}{r} 3. \quad \cancel{7} + m = -4 \\ \quad \quad \cancel{7} \quad \quad -7 \\ \hline \boxed{m = -11} \end{array}$$

$$\begin{array}{r} 4. \quad (-17) \left( \frac{x}{3} \right) = 2 \\ \hline \boxed{-51 = x} \end{array}$$

$$\begin{array}{r} 5. \quad -14 = 8 - 2y \\ \quad \quad \cancel{-8} \quad \cancel{-8} \\ \hline -22 = \cancel{-2y} \\ \quad \quad \quad \quad \cancel{-2} \quad \quad \quad \quad \cancel{-2} \\ \hline \boxed{11 = y} \end{array}$$

$$\begin{array}{r} 6. \quad \frac{x}{-2} + 14 = 8 \\ \quad \quad \quad \quad \cancel{-14} \quad \cancel{-14} \\ \hline -2 \left( \frac{x}{-2} \right) = (-6) \cdot -2 \\ \hline \boxed{x = 12} \end{array}$$

## Solving Equations with Decimals

When solving equations with decimals, we can solve like we solve equations with integers (if we are comfortable with computing with decimals) OR we can clear the decimals by multiplying by powers of 10 (10, 100, 1000, etc.) and by using the distributive property, so we don't have to compute with decimals.

### Examples:

1.  $n + 14.3 = 6.25$

$$\begin{array}{r} n + 14.3 = 6.25 \\ -14.3 \quad -14.3 \\ \hline \end{array}$$

$$\boxed{n = -8.05}$$

OR

$$100(n + 14.3) = (6.25)100$$

$$100n + 1430 = 625$$

$$\begin{array}{r} 100n + 1430 = 625 \\ -1430 \quad -1430 \\ \hline \end{array}$$

$$\frac{100n}{100} = \frac{-805}{100}$$

$$\boxed{n = -8.05}$$

2.  $\frac{-91.2}{11.4} = \frac{11.4m}{11.4}$

$$\boxed{-8 = m}$$

OR

$$10(-91.2) = (11.4m)10$$

$$\begin{array}{r} -912 = \frac{114m}{114} \\ \hline \end{array}$$

$$\boxed{-8 = m}$$

## Solving Equations with Fractions

When solving equations with decimals, we can solve like we solve equations with integers (if we are comfortable with computing with fractions) OR we can clear the fractions by multiplying by the least common multiple of the denominators (LCD) and by using the distributive property, so we don't have to compute with fractions.

### Examples:

1.  $-1\frac{1}{3} = y - \frac{3}{4}$

$$\begin{array}{r} -1\frac{1}{3} = y - \frac{3}{4} \\ +\frac{3}{4} \quad +\frac{3}{4} \\ \hline \end{array}$$

$$\boxed{-\frac{7}{12} = y}$$

$$\begin{array}{r} \frac{1 \times 4}{3 \times 4} = \frac{4}{12} = \frac{16}{12} \\ -\frac{3 \times 3}{4 \times 3} = -\frac{9}{12} = -\frac{9}{12} \\ \hline \end{array}$$

OR

$$-1\frac{1}{3} = y - \frac{3}{4}$$

$$12\left(-\frac{4}{3}\right) = \left(y - \frac{3}{4}\right)12$$

$$\begin{array}{r} -16 = 12y - \frac{9}{1} \\ +9 \\ \hline \end{array}$$

$$\frac{-7}{12} = \frac{12y}{12}$$

$$\boxed{-\frac{7}{12} = y}$$

2.  $-2\frac{1}{2}n = -\frac{5}{8}$

$$\begin{array}{r} -2\frac{1}{2}n = -\frac{5}{8} \\ -2\frac{1}{2} \quad -2\frac{1}{2} \\ \hline \end{array}$$

$$\boxed{n = \frac{1}{4}}$$

$$\frac{-5}{8} \div \frac{5}{2} = \frac{-5}{8} \times \frac{2}{5} = \frac{1}{4}$$

OR

$$-2\frac{1}{2}n = -\frac{5}{8}$$

$$8\left(-\frac{5}{2}n\right) = \left(-\frac{5}{8}\right)8$$

$$\begin{array}{r} -20n = -5 \\ -20 \quad -20 \\ \hline \end{array}$$

$$\boxed{n = \frac{5 \div 5}{20 \div 5} = \frac{1}{4}}$$

### Solving Equations that Require Using the Distributive Property

The first step when we have parentheses in an equation is to clear the parentheses using the distributive property. Then, we can solve the equation.

#### Examples:

1.  $12 = 2(x + 9)$

$$\begin{array}{r} 12 = 2x + 18 \\ -18 \quad -18 \end{array}$$

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$$\begin{array}{r} -6 = 2x \\ \frac{-6}{2} = \frac{2x}{2} \end{array}$$

$$\boxed{-3 = x}$$

2.  $-4(y - 8) = 36$

$$\begin{array}{r} -4y + 32 = 36 \\ -32 \quad -32 \end{array}$$

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$$\begin{array}{r} -4y = 4 \\ \frac{-4y}{-4} = \frac{4}{-4} \end{array}$$

$$\boxed{y = -1}$$

### Solving Equations that Require Collecting Like Terms

The first step when we have like terms (on the *same* side of the equal sign) in an equation is to combine the like terms. Then, we can solve the equation.

#### Examples:

1.  $(4n) + 5(-2n) = -11$

$$\begin{array}{r} 2n + 5 = -11 \\ -5 \quad -5 \end{array}$$

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$$\begin{array}{r} 2n = -16 \\ \frac{2n}{2} = \frac{-16}{2} \end{array}$$

$$\boxed{n = -8}$$

2.  $-5 + 3n - 6n = 13$

$$\begin{array}{r} -5 - 3n = 13 \\ +5 \quad +5 \end{array}$$

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$$\begin{array}{r} -3n = 18 \\ \frac{-3n}{-3} = \frac{18}{-3} \end{array}$$

$$\boxed{n = -6}$$

### Solving Equations that Require Using the Distributive Property and Collecting Like Terms

When we have parentheses *and* like terms (on the *same* side of the equal sign) in an equation, the first step is to clear the parentheses using the distributive property. The next step is to combine like terms. Then, we can solve the equation.

#### Examples:

1.  $-18 = -2(m+4) - 3m$

$$-18 = -2m - 8 - 3m$$

$$-18 = -5m - 8$$

$$+ 8 \quad + 8$$

$$\frac{-10 = -5m}{-5 \quad -5}$$

$$\boxed{2 = m}$$

2.  $5x - (7x - 2) = 8$

$$5x - 7x + 2 = 8$$

$$-2x + 2 = 8$$

$$-2 \quad -2$$

$$\frac{-2x = 6}{-2 \quad -2}$$

$$\boxed{x = -3}$$