

**Learning Goal 1 – Solving Equations Review**

Level 2	<b>Terminology:</b> I can recognize specific terminology such as variable, equation, and solution.
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Describe what the solution to an equation is:

\* Value(s) of the variable that makes the equation true.

What is the difference between an expression and an equation?

\* An equation is a mathematical statement that two expressions are equal.

\* An express is a mathematical phrase of variables and constants

Level 2	<b>Inverse Operations:</b> I can perform basic processes such as recognize and use inverse operations.
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1. Solve each equation for the variable. Use inverse operations and show your work. Leave any non-whole number answers as simplified fractions.

<p>a. <math>-3x = -21</math></p> $\frac{-3}{-3} \frac{-3}{-3}$ $x = 7$	<p>b. <math>z + 5 = -10</math></p> $\frac{-5}{-5}$ $z = -15$	<p>c. <math>4 - x = 12</math></p> $\frac{-4}{-1} \frac{-4}{-1}$ $\frac{-x}{-1} = \frac{8}{-1}$ $x = -8$
<p>d. <math>-4z + 4 = 14</math></p> $\frac{-4}{-4} \frac{-4}{-4}$ $\frac{-4z}{-4} = \frac{10}{-4}$ $z = \frac{10}{4} = \frac{-5}{2}$	<p>e. <math>\frac{2}{3}x - 4 = 10</math></p> $\frac{+4}{+4} \frac{+4}{+4}$ $\frac{3}{2} \cdot \frac{2}{3} \cdot \frac{2}{3} x = \frac{14}{1} \cdot \frac{3}{2}$ $x = 21$	<p>f. <math>4x + 3 = 11</math></p> $\frac{-3}{-3} \frac{-3}{-3}$ $\frac{4x}{4} = \frac{8}{4}$ $x = 2$
<p>g. <math>\frac{x}{5} + 5 = -3</math></p> $\frac{-5}{-5} \frac{-5}{-5}$ $\frac{x}{5} = -8.5$ $x = -40$	<p>h. <math>\frac{5}{9}x - \frac{2}{3} = \frac{2}{9}</math></p> $+\frac{2}{3} + \frac{2}{3}$ $\frac{5}{9}x = \frac{2}{9} + \frac{6}{9}$ $\frac{9}{5} \cdot \frac{5}{9} x = \frac{8}{9} \cdot \frac{9}{5}$ $x = \frac{8}{5}$	<p><u>OP</u> LCD: 9</p> $\frac{9}{1} \left( \frac{5}{9} x \right) - \frac{9}{1} \left( \frac{2}{3} \right) = \frac{9}{1} \left( \frac{2}{9} \right)$ $5x - 6 = 2$ $\frac{+6}{+6} \frac{+6}{+6}$ $\frac{5x}{5} = \frac{8}{5}$ $x = \frac{8}{5}$

Level 2 **Distributive Property:** I can use the distributive property.

2. Simplify each expression

a.  $3(x + 5)$

$$3x + 15$$

b.  $3(5y - 10)$

$$15y - 30$$

c.  $-2(3x - 4)$

$$-6x + 8$$

d.  $8(2k + 1 - 2y)$

$$16k + 8 - 16y$$

Level 2 **Like Terms:** I can combine like terms.

2. Simplify each expression

a.  $3x + 6x - 4 + 10$

$$9x + 6$$

b.  $10y - 8 + 5y - 2$

$$15y - 10$$

c.  $15 + 20m - 4m + 6m$

$$22m + 15$$

d.  $8x^2 + 2x - 10 - 4x$

$$8x^2 - 2x - 10$$

Level 2 **Literal Equations:** I can solve a literal equation

3. Solve each equation for the given variable

a. Solve  $6y + 5x = 12$  for  $y$

$$\begin{aligned} & -5x - 5x \\ \frac{6y}{6} &= \frac{-5x + 12}{6} \end{aligned}$$

$$y = \frac{-5x}{6} + 2$$

b. Solve  $6y - 2a = 5x$  solve for  $x$

$$\frac{6}{5}y - \frac{2a}{5} = x$$

Level 3

Solving Multistep Equations: I can solve one variable equations (including absolute value equations).

2. Solve each equation. Leave any non-whole number answers as simplified fractions.

a.  $5x + 2(x - 4) = 20$

$$5x + 2x - 8 = 20$$

$$\begin{array}{r} 7x - 8 = 20 \\ +8 \quad +8 \\ \hline 7x = 28 \\ \frac{7x}{7} = \frac{28}{7} \end{array} \rightarrow x = 4$$

b.  $2 + 4x - 6 = 12 - 2x$

$$4x - 4 = 12 - 2x$$

$$\begin{array}{r} 4x - 4 = 12 - 2x \\ +4 \quad +4 \\ \hline 4x = 16 - 2x \\ +2x \quad +2x \\ \hline 6x = 16 \end{array} \rightarrow x = \frac{16}{6}$$

$$x = \frac{8}{3}$$

c.  $-3(x - 4) = -6 + 6x$

$$-3x + 12 = -6 + 6x$$

$$\begin{array}{r} -3x + 12 = -6 + 6x \\ +3x \quad +3x \\ \hline 12 = -6 + 9x \\ +6 \quad +6 \\ \hline 18 = 9x \\ \frac{18}{9} = \frac{9x}{9} \end{array} \rightarrow x = 2$$

d.  $|9 - 2x| = 3$

$$9 - 2x = 3$$

$$\begin{array}{r} 9 - 2x = 3 \\ -9 \quad -9 \\ \hline -2x = -6 \\ \frac{-2x}{-2} = \frac{-6}{-2} \end{array} \rightarrow x = 3$$

$$9 - 2x = -3$$

$$\begin{array}{r} 9 - 2x = -3 \\ -9 \quad -9 \\ \hline -2x = -12 \\ \frac{-2x}{-2} = \frac{-12}{-2} \end{array} \rightarrow x = 6$$

e.  $|5x - 1| + 3 = 20$

$$|5x - 1| = 17$$

$$\begin{array}{r} 5x - 1 = 17 \\ +1 \quad +1 \\ \hline 5x = 18 \\ \frac{5x}{5} = \frac{18}{5} \\ x = \frac{18}{5} \end{array}$$

$$\begin{array}{r} 5x - 1 = -17 \\ +1 \quad +1 \\ \hline 5x = -16 \\ \frac{5x}{5} = \frac{-16}{5} \\ x = \frac{-16}{5} \end{array}$$

f.  $|3x + 2| + 8 = 3$

$$|3x + 2| = -5$$

$$\emptyset$$

6.67

Level 3

Word Problems: I can write and solve linear equations that model real life situations.

3. Write and solve an equation that models each situation

a. Allison drives 12 miles to work each day. She drives an average of 40 miles per hour on her drive. How long does it take her to get to work? Round 2 decimal places and include units.

$$t: \text{time} \quad 40 \frac{\text{mi}}{\text{hr}} \cdot t = 12 \text{ mi}$$

$$t = \frac{12 \text{ mi}}{40 \frac{\text{mi}}{\text{hr}}}$$

$$t = \frac{12}{40} \text{ hr}$$

$$t = 0.30 \text{ hrs}$$

b. Anthony bought 4 shirts that all cost the same amount of money. He forgot how much each shirt cost but knows he paid \$43.00. How much did each shirt cost? Round 2 decimal places and include units.

x: cost of each shirt

$$4x = 43$$

$$x = \frac{43}{4}$$

$$x = \$10.75 \text{ each shirt}$$