

INTERVENTION DAY -

Linear Equations (Solving)

(One-Step, Two-Step, Multi-Step)

Obj: Isolate the variable; solve for the variable.

We will use the Addition Property of Equality.

Ex) Solve for the variable

$$\begin{array}{r} x - 12 = 9 \\ +12 \quad +12 \quad \leftarrow \text{Addition Property} \\ \hline x = 21 \end{array}$$

Ex) Solve for the variable

$$\begin{array}{r} +5m + 4 = 6m \\ \xrightarrow{-5m} \quad \quad \quad -5m \\ \hline \end{array}$$

coefficient

$$4 = 1m$$

* It does not matter which side of the = sign the variable is on.

$$\begin{array}{r} \text{Ex) } 10 - a = -2a + 9 \\ \quad \quad -9 \quad \quad \quad +9 \\ \hline \end{array}$$

* Decide whether you want to work with the numbers or variables first.

$$\begin{array}{r} 1 - a = -2a \\ \quad +a \quad \quad +a \\ \hline \end{array}$$
$$\begin{array}{r} 1 = -1a \\ \frac{1}{-1} = \frac{-1a}{-1} \\ \hline \end{array}$$
$$-1 = a$$

Ex) Solve for x

$$\begin{array}{r} 6x - 8 = 12 + 5x \\ -5x \qquad -5x \\ \hline \end{array}$$

$$\begin{array}{r} \boxed{x} - 8 = 12 \\ +8 \quad +8 \\ \hline \end{array}$$

$$x = 20 \quad \checkmark$$

Ex)

$$\frac{p}{4} = -6$$

\Downarrow

$$\left(\frac{4}{1}\right) \frac{1}{4} p = -6 \left(\frac{4}{1}\right)$$

* Use the Multiplication Property of Equality.

* Multiply by the reciprocal of the variable term.

$$p = -24$$

~~$$\frac{p}{4} = \frac{-6}{1}$$~~

$$p = -24$$

Cross-Product

Solve:

$$\frac{3}{5}K = -21 \Rightarrow \frac{3K}{5} = -21$$

$$\left(\frac{5}{3}\right)\left(\frac{3}{5}\right)K = -21\left(\frac{5}{3}\right)$$

$$K = -35$$

Solve: $7(p-2) + p = 2p + 4$

$$7p - 14 + p = 2p + 4$$

$$8p - 14 = 2p + 4$$

$$\begin{array}{r} -2p \quad -2p \\ \hline \end{array}$$

$$6p - 14 = 4$$

$$\begin{array}{r} +14 \quad +14 \\ \hline \end{array}$$

$$\frac{6p}{6} = \frac{18}{6}$$

$$p = 3$$

Solve:

$$7(p-2) + p = 2p + 4$$

Solve:

$$\boxed{\frac{1}{5}x - \frac{2}{3}x - 2 = -\frac{2}{5}x}$$

$$-\frac{1}{15}x - 2 = -\frac{2}{5}x$$

$$+\frac{1}{15}x \qquad +\frac{1}{15}x$$

$$-2 = \frac{1}{15}x$$

$$-30 = x$$

Solve:

$$15 \left[\frac{1}{5}x - \frac{2}{3}x - 2 = -\frac{2}{5}x \right] 15$$

* Multiply by the LCD to clear the fractions.

$$15\left(\frac{1}{5}x\right) - 15\left(\frac{2}{3}x\right) - 15(2) = 15\left(-\frac{2}{5}x\right)$$

$$3x - 10x - 30 = -6x$$

$$-7x - 30 = -6x$$

$$7x \qquad 7x$$

$$\underline{-30 = x}$$