

## 2.3 | General Linear Equations

- 1.) Simplify / Expand / Distribute / Combine Like Terms on each side.
- 2.) Collect variable terms on one side (preference left) and non-variable terms on the other. (uses add/subtract).
- 3.) Isolate the variable.  $\wedge$  (Div/Mult)  
Combining Like Terms?
- 4.) Check Solution.

Ex

$$2x + 3x = -35$$

Solve for  $x$

1)

$$5x = -35$$

2)

nothing to do...

3)

$$\frac{5x}{5} = \frac{-35}{5}$$

$$x = -7$$

4)

$$2(\quad) + 3(\quad) \stackrel{?}{=} -35$$

$$2(-7) + 3(-7) \stackrel{?}{=} -35$$

$$-14 + (-21) \stackrel{?}{=} -35$$

$$-35 \stackrel{?}{=} -35$$

Report: The solution is  $x = -7$ .

Ex Solve  $4a + 1 = 9(a - 1)$

1)  $4a + 1 = 9a - 9$

2)  $\underline{4a} + 1 - \underline{9a} = 9a - 9 - 9a$

$$-5a + 1 = -9$$

$$-5a + 1 - 1 = -9 - 1$$

$$-5a = -10$$

3)  $\frac{-5a}{-5} = \frac{-10}{-5}$

$$a = 2$$

4) Check:  $4(\quad) + 1 = 9(\quad) - 1$

$$4(2) + 1 \stackrel{?}{=} 9(2 - 1)$$

$$8 + 1 \stackrel{?}{=} 9(1)$$

$$9 \stackrel{?}{=} 9$$

So the solution is  $a = 2$ .

Ex Solve  $2x + 4x - 7 = 13x - x + 5$

1)  $6x - 7 = 12x + 5$

2)  $6x - 7 - 12x = \underline{12x} + 5 - \underline{12x}$

$$6x + (-7) + (-12x) = 5$$

$$6x + (-12x) + (-7)$$

$$-6x - 7 = 5$$

$$-6x - 7 + 7 = 5 + 7$$

$$-6x = 12$$

3)  $\frac{-6x}{-6} = \frac{12}{-6}$   
 $x = -2$

4) Check:

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

$$\stackrel{?}{=} 13(-2) - (-2) + 5$$

$$\underline{-4 - 8 - 7} \stackrel{?}{=} \underline{-26 + 2 + 5}$$

$$-12 - 7 \stackrel{?}{=} -24 + 5$$

$$-19 \stackrel{?}{=} -19$$

So the solution

is  $x = -2$ .

Ex  $1.05n - 3.8 = 0.4n + 5.95$

1) nothing to do....

2)  $\underline{1.05n} - 3.8 \quad \underline{-0.4n} = \underline{0.4n} + 5.95 \quad \underline{-0.4n}$

$$\begin{array}{r} 1.05 \\ - 0.40 \\ \hline 0.65 \end{array}$$

$$0.65n - 3.8 = 5.95$$

$$0.65n - 3.8 + 3.8 = 5.95 + 3.8$$

$$0.65n = 9.75$$

$$\begin{array}{r} 5.95 \\ + 3.80 \\ \hline 9.75 \end{array}$$

3)  $\frac{0.65n}{0.65} = \frac{9.75}{0.65}$

$$n = \frac{9.75}{0.65}$$

$$n = 15$$

use calculator

4) Check:  $1.05(15) - 3.8 \stackrel{?}{=} 0.4(15) + 5.95$

Calculator  $\rightarrow$   $15.75 - 3.8 \stackrel{?}{=} 6 + 5.95$

$$11.95 \quad \checkmark \quad 11.95$$