2.1A   Equations and Checking

A.   Equations vs. Non-equations

We have to first make sure we recognize the difference between an equation and a non-equation.

An equation has an **equals sign** $=$ in it.

An equation has us solve for an unknown (say x).

A non-equation asks us to do something, but **not** find the value of the unknown.

Equations	**Non-equations**
1. $x^2 + 5x + 6 = 0$	1. Factor $x^2 + 5x + 6$
2. $\frac{5}{x-3} + \frac{2}{x-1} = 7$	2. Combine $\frac{5}{x-3} + \frac{2}{x-1}$
3. $2(x - 3) = 2x - 6$	3. Expand $2(x - 3)$

An equals sign changes what we do.

Make sure you do the right thing.

If a problem does not have an equals sign $=$ in it, do **not** put one in. You change the problem.

B. Checking Solutions

A **solution** to an equation is its "answer".

We can check to see if it is correct, by plugging it into the equation and seeing if it is correct.

Note: When we plug the number in, we don't know if the equation is true, so we indicate this by writing $\overset{?}{=}$ at each step.

Example 1: Is 3 a solution to $5x - 6 = 2x + 1$?

Solution

Plug it in:

$$5(3) - 6 \overset{?}{=} 2(3) + 1$$

$$15 - 6 \overset{?}{=} 6 + 1$$

$$9 \overset{?}{=} 7$$

Ans $\boxed{\text{NO}}$

Example 2:   Is 2 a solution to $4 - 3x = 2x - 6$?

Solution

Plug it in:

$$4 - 3(2) \overset{?}{=} 2(2) - 6$$

$$4 - 6 \overset{?}{=} 4 - 6$$

$$-2 \overset{?}{=} -2$$

Ans $\boxed{\text{YES}}$

Equations that are true for one, or just a few, values are called **conditional**. Equations that are true no matter what value you put in are called **identities**.