**EQUATION** is a mathematical sentence that uses an equal sign $(=)$. It can be used to represent the relationship between two quantities that have the same value.

**TYPES:**

1. **True equation**: If the expressions on either side of the equal sign are equal.
2. **False equation**: If the expressions on either side of the equal sign are not equal.
3. **Open Sentence**: If the equation contains one or more variables, and maybe a true or false depending on the values of its variables.

**Sample Problem 1: Tell whether each equation is true, false, or open. Explain.**

1. $12+18=15+15$
2. $5⋅7=34$
3. $3x+12=48$

**SOLUTION OF AN EQUATION** containing a variable is a value of the variable that makes the equation true.

**Sample Problem 2: Tell whether the given number is a solution of each equation.**

1. Is $x=6$ a solution of the equation$ x-14=5$?
2. Is $y=\frac{1}{2}$ a solution of the equation$ 4y+2=10$?
3. Is $z=5$ a solution of the equation$ 8z-6=50$?

**Sample Problem 3: Find the solution of each equation.**

1. $8b-3=13$
2. $-16=26-21x$
3. $-8z-12=-4$

**Sample Problem 4: Use a table to find the solution of each equation.**

1. $7x+10=45$
2. $7x+14=21$
3. $12=4x+8$

**Sample Problem 5: Use a table to find two consecutive integers between which the solution lies.**

1. $8x-20=37$
2. $3x+4=36$
3. $8=3-2x$

**Sample Problem 6: Find the solution of each equation using mental math or table. If the solution lies between two consecutive integers, identify those integers.**

1. $3x-9=14$
2. $17=9+\left(-x\right)$
3. $8=21-7x$

**TRANSLATING SENTENCES TO EQUATIONS:**

* Use variables to represent the unspecified numbers or measures referred to in the sentence or problem.
* Write the verbal expressions as algebraic expressions.

Verbal Expressions that suggest the **equals sign**:

**Sample Problem 7:** Write an equation for each sentence.

1. Fifteen times the number $a$ is equal to four times the sum of $b$ and $c$.
2. Three times $x$ subtracted from 57 equals 29.
3. The difference of 10 and a number is 5.