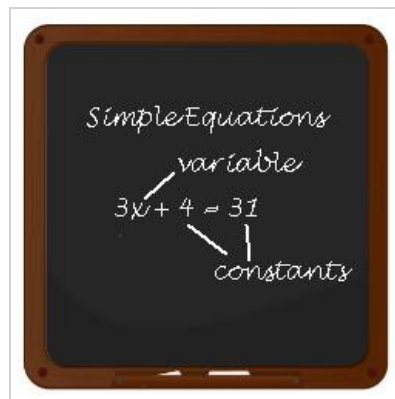


Simple Equations : Mathematics

Introduction to Simple Equations

An equation is a condition of equality between two mathematical expressions.

e.g. $2x - 3 = 5$, $3x + 9 = 11$, $4y + 2 = 12$



The value of the variable for which the left hand side of an equation is equal to its right hand side is called the solution of that equation.

e.g. For the equation, $5x + 5 = 15$, $x = 2$ is a solution.

When the same number is added or subtracted to or from both the sides of an equation, the value of the left hand side remains equal to its value on the right hand side.

e.g. (1) $5x + 3 = 13$

On adding 2 to both sides of the equation, we get

$$5x + 3 + 2 = 13 + 2$$

$$5x + 5 = 15$$

(2) On subtracting 2 from both sides of the equation, we get

$$5x + 3 - 2 = 13 - 2$$

$$5x + 1 = 11$$

When an equation is divided or multiplied on both the sides by a non-zero number, the value of the left hand side remains equal to its value on the right hand side.

e.g. (1) $5x + 3 = 13$

On dividing both sides of the equation by 4, we get

$$(5x + 3) \div 4 = 13 \div 4$$

$$2) 5x + 1 = 13$$

On multiplying both sides of the equation by 4, we get

$$4(5x + 1) = 4(13)$$

$$20x + 4 = 52$$

To find the solution of an equation, a series of identical mathematical operations are performed on both the sides of the equation so that only the variable remains on one side. On simplifying all the numbers, the result obtained is the solution of the equation.

Ex: $3x + 8 = 83$

$$3x + 8 - 8 = 83 - 8$$

$$3x = 75$$

$$x = 75 \div 3$$

$$x = 25.$$

Moving a term of an equation from one side to the other side is called transposing. Transposing a number is same as adding to or subtracting the same number from both sides of the equation.

Ex: Solve $2x + 8 = 24$

Given, $2x + 8 = 24$

Transposing 8 to the right hand side, we get

$$\Rightarrow 2x = 24 - 8$$

$$\Rightarrow 2x = 16$$

$$\Rightarrow x = 16 \div 2$$

$$\Rightarrow x = 8.$$

Hence, the value of x is 8.

The sign of a number changes when it is transposed from one side of the equation to the other.