

Algebra

01

Linear equation in one variable



Identification of the question : A general one-variable linear equation having "x" as a the single variable.

Solving : Always bring the variable to one side and keep the constant value other side ...doneeee!!

Example : Solve $4x + 3 = 2x + 6 - x$

solution : $4x - 2x + x = 6 - 3$ { keeping all variables in LHS and constant values in RHS }

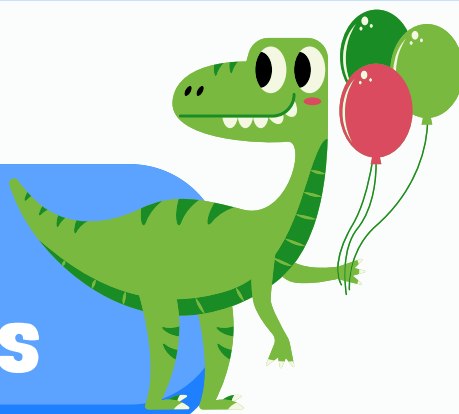
$$3x = 3$$
$$x = 1$$

Now try this, $5 - 7(2 - 4x) = 16 - 8(2 - 4x)$ find the value of x.

Hint: consider $(2 - 4x)$ as a new variable 💡

02

Systems of two linear equations in two variables



$$a_1 x + b_1 y = c_1$$

equation ----- 1

$$a_2 x + b_2 y = c_2$$

equation ----- 2

Here a_1, a_2, b_1 and b_2 are the coefficient of the equations & the fractions are in simplest form.

SL NO.	Pairs of lines	$\frac{a_1}{a_2}$	$\frac{b_1}{b_2}$	$\frac{c_1}{c_2}$	Compare the ratios	Graphical representation	Algebraic representation
1	$2x - 4y = 0$ $6x + 8y - 40 = 0$	$\frac{1}{3}$	$-\frac{1}{2}$	$\frac{0}{-40}$	$\frac{a_1}{a_2} \neq \frac{b_1}{b_2}$	Intersecting lines	Exactly one solution(unique)
2	$2x + 3y - 9 = 0$ $6x + 9y - 27 = 0$	$\frac{1}{3}$	$\frac{1}{3}$	$\frac{1}{3}$	$\frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2}$	Coincident lines	Infinitely many solutions
3	$x + 2y - 4 = 0$ $2x + 4y - 12 = 0$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{3}$	$\frac{a_1}{a_2} = \frac{b_1}{b_2} \neq \frac{c_1}{c_2}$	Parallel lines	No solution

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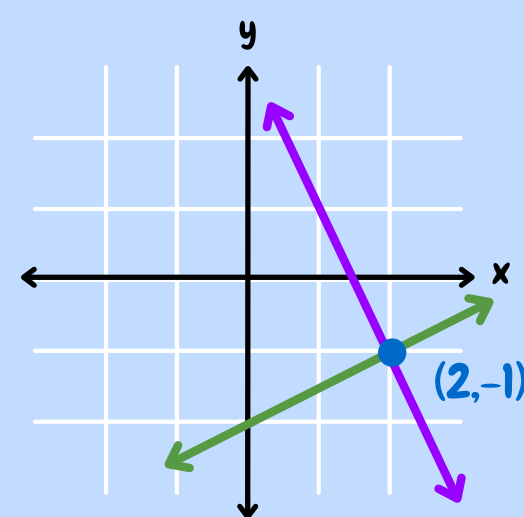
Linear functions



A linear function forms a STRAIGHT LINE on the graph.

Algebraic representation : $y = mx + c$

Representation as function : $f(x) = mx + c$



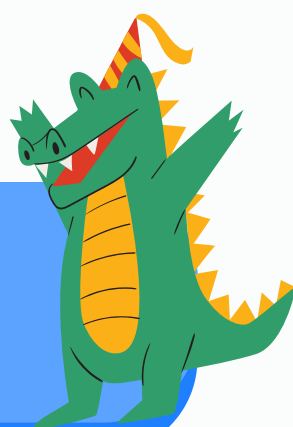
POINTS to remember : 1) "m" is the slope of the equation.

2) Lines that are perpendicular to each other have slopes that are **negative reciprocals** of the other.

3) Lines that are perpendicular to each other, the product of the slopes is equal to -1. i.e., $m_1 \times m_2 = -1$

04

PEMDAS



We use PEMDAS to solve the questions that involve different mathematical signs at the same time.

Always solve the expression from LEFT to RIGHT.

The order as follows: P (parentheses, brackets and groupings)

E (Exponents)

M (multiplication) {perform left to right depending upon which operation

D (division) comes first}

A (Addition) {perform left to right depending upon which operation

S (Subtraction) comes first}