## THEORETICAL PART:

**Definition:**

A **linear equation in two variables**, say the variables $x$ and $y$, is an equation that can be written in the form $ax + by = c$, where $a, b, c$ are constants and $a, b \neq 0$. This form of such an equation is called the **standard form**.

**Definition.**

Given a graph in the Cartesian plane, any point where the graph intersects the $x$-axis is called an $x$**-intercept**, and any point where the graph intersects the $y$-axis is called a $y$**-intercept**. All $x$-intercepts are of the form $(c, 0)$, and all $y$-intercepts are of the form $(0, c)$.

**Definition.**

We refer to the horizontal number line as the $x$**-axis**, the vertical number line as the $y$**-axis**, and the two coordinates of the ordered pair $(a, b)$ as the $x$**-coordinate** and the $y$**-coordinate**.

The graph of an equation is a plot in the Cartesian plane of all of the ordered pairs that make up the solution set of the equation.

## PRACTICAL PART:

1. Determine if the following equations are linear:

   (a) $3x - (2 - 4y) = x - y + 1$

   (b) $\dfrac{x + 2}{3} - y = \dfrac{y}{5}$

   (c) $4x^3 - 2y = 5x$

   (d) $x^2 - (x - 3)^2 = 3y$

2. Find the *x*- and *y*-intercepts of the following equations, and sketch their graphs:

   (a) $3x - 4y = 12$

   (b) $4x - (3 - x) + 2y = 7$

3. Graph the following equations (horizontal and vertical lines):

   (a) $x = 5$

   (b) $2x - 2 = 3$

   (c) $3x + 2(x + 7) - 2y = 5x$