Ch-4 Linear Equations in 2 Variables

1. An equation of the form ax + by + c = 0, where a, b, c are real numbers, $a \neq 0$, $b \neq 0$ and x, y are variables is called a linear equation in two variable.
2. Any pair of values of x and y, which satisfies the equation ax + by + c = 0, where a, b, c are non-zero real numbers, is called a solution of the equation.
3. A linear equation in two variables has infinitely many solutions.
4. Every point on the graph of a linear equation in two variables is a solution of the equation.
5. Geometric representation of ax + c = 0 as an equation
   a. in one variable is $x = -\frac{c}{a}$.
   b. in two variable is a.x + 0.y = –c.
6. If $a \neq 0$, $c \neq 0$ and b = 0, then the equation ax + by + c = 0 reduces to ax + c = 0 or $x = -\frac{c}{a}$. The graph is a straight line, parallel to y-axis and passing through the point $\left(-\frac{c}{a}, 0\right)$.
7. If $b \neq 0$, $c \neq 0$ and a = 0, then the equation ax + by + c = 0 reduces to by + c = 0 or $y = -\frac{c}{b}$. The graph is a straight line parallel to x-axis and passing through the point $\left(0, -\frac{c}{b}\right)$.
8. If b = 0, c = 0 and $a \neq 0$, then the equation ax + by + c = 0 reduces to ax = 0 i.e., x = 0, the graph of y-axis itself.
9. If a = 0, c = 0 and $b \neq 0$, then the equation ax + by + c = 0 reduces to by = 0 i.e., y = 0, the graph is x-axis itself.
10. If c = 0 , then the equation ax + by + c = 0 reduces to ax + by = 0. The graph is a line passing through origin.