Mathematics

Board – CBSE	Class – 8th	Topic – Introduction to Graph

- **INTRODUCTION TO GRAPHS**
  - Graphs are the visual representations of data collected. It is easier to understand and it is true when there is a comparison to be shown.

    Graphs have different forms like a bar graph, pie graph, histogram, line graph, etc.

    (1) A bar graph is used to show the comparison among categories & it may consist of two or more parallel (vertical or horizontal) bars.

    (2) A pie chart is used to compare parts of a whole, where the circle represents the whole.

    (3) A histogram is a bar graph that shows data in intervals and it has adjacent bars over the intervals.
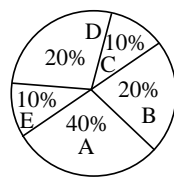
    There are no gaps between bars since there is no interval between the intervals.

    (4) A line graph displays data that changes continuously over a period of time. It consists of some points that are joined by consecutive lines.
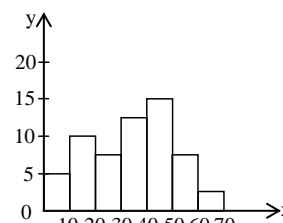
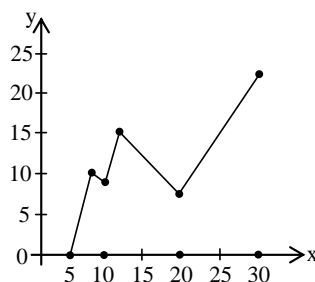   **Note:** If points are joined by broken lines then these types of graphs are called linear graphs.
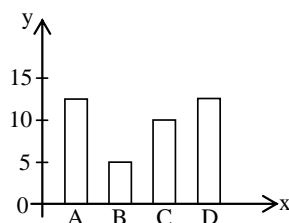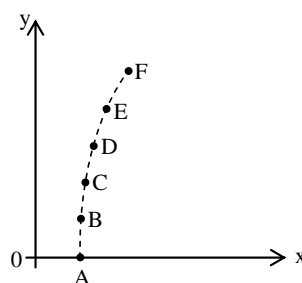

Bar Graph

**Pie chart (circle graph)**

Histogram

Line graph

Linear graph

The horizontal line is usually called the x-axis & the vertical line is called the y-axis. The intersection points of both perpendicular axes is called origin (0).

Sometimes a jagged line ⌐∿⌐ or kink has been used along the horizontal line to indicate that we are not showing some numbers between 0 to the first given number.
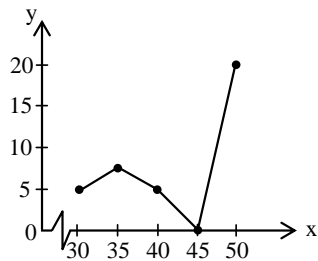
- **Coordinates:** In a plane, we require positions of a point in horizontal & vertical direction (or in x & y direction respectively). These positions are called coordinates or Cartesian coordinates of a point.

E.g.: If a point covers a 3-unit distance in the +x direction and 4 units in +y direction then the coordinates of the point are $(3, 4)$.
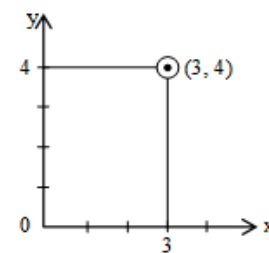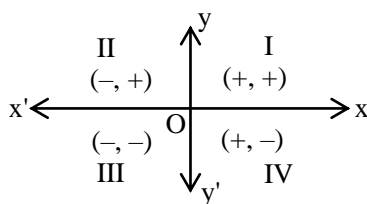
Here 3 is x coordinate or abscissa

and 4 is y coordinate or ordinate.

Note: These two axes (lines) are perpendicular to each other and divide a paper (plane) into four equal parts, each part is called a quadrant.

Coordinate of origin O is $(0, 0)$.

Coordinate can be +ve or –ve.
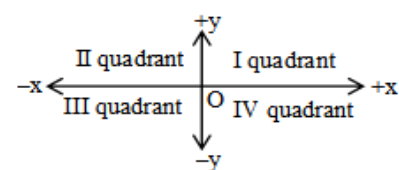
Sign system in the quadrant is as follows.

on the x-axis, the ordinate (y part) at any point is always 0.

E.g. $(-5, 0)$ $(2, 0)$ $(7, 0)$ etc. are on x axis

On the y-axis, the abscissa (x part) at any point is always 0.

E.g.(0, 7) (0, 3/2) (0, –5) etc. are on y axis.

Ex.1 Find the location of the following points.

(–3, 4), (2, 7), (0, 3), (–5, –2), (3, –8), (–7, –11), (9, 0), (0, 0)

Sol.II quadrant, Iq, on y axis, IIIq, IVq, IIIq, on x axis, origin.

- **Variable:** Quantity which changes its value according to a given condition or in other words, a number not having a fixed value, is called a variable like x, y, z, t…, etc.

Independent and Dependent variable:

If one quantity affects the other quantity then the first one is called the independent variable and the other quantity is called a dependent variable.

(1) Increase of time affects the amount of interest. Here time is independent and interest is the dependent variable.

(2) As speed increases the distance is covered in lesser time. Speed is independent and time is the dependent variable.

(3) As sides increase of any polygon then perimeter also increases. Length of the sides are independent & perimeter is the dependent variable.

- **Distance from coordinate axis:**

If a point p (x, y) is located on a plane then the distance of this point from x-axis is equal to the y coordinate and from y-axis, the distance is equal to the x coordinate.

Note: Distance is always positive