INTRODUCTION TO GRAPHS

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CHAPTER

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INTRODUCTION TO GRAPHS

Graphs are visual representation of data collected. It is easier to understand and it is true when there is a comparison to be shown.

Graphs are in some different forms like bar graph, pie graph, histogram, line graph etc.

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

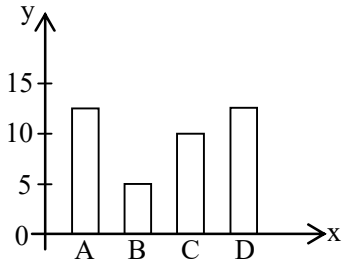
(2) A pie chart is used to compare part of a whole, the circle represents the whole.

(3) A histogram is a bar graph shows data in intervals and it has adjacent bars over the intervals.

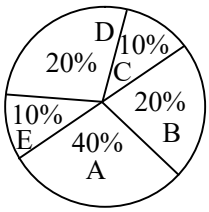
There is no gaps between bars since there is no interval between the intervals.

(4) A line graph displays data that changes continuously over period of time. It consist some points which joined by consecutive lines.

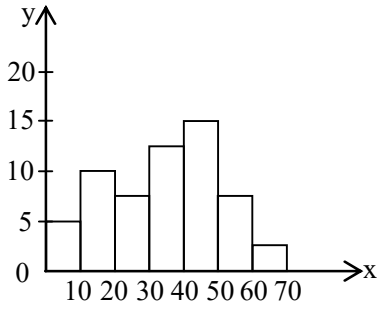
Note : If points are joined by broken line then these type of graphs are called linear graph.



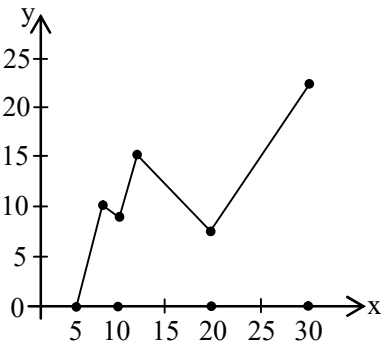
Bar Graph



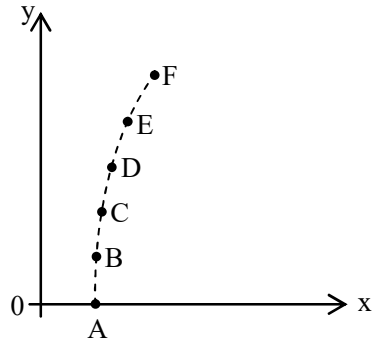
Pie chart (circle graph)



Histogram



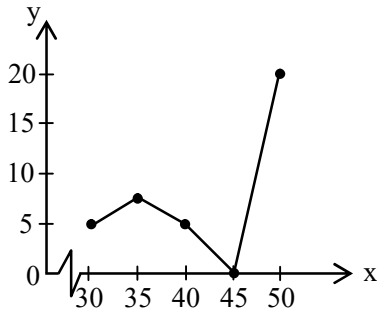
Line graph



Linear graph

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

Some times a jagged line ⌇ or kink has been used along horizontal line to indicate that we are not showing some numbers between 0 to first given number.

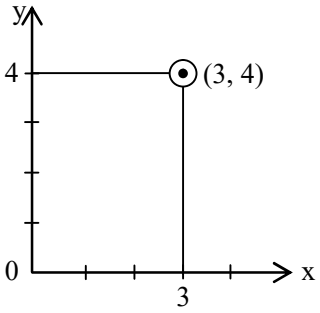


◈ **Coordinates :** In a plane we require positions of a point in horizontal & vertical direction (or in x & y direction respectively). These positions are called coordinates or Cartesian coordinates of a point.

Eg : If a point covers 3 unit distance in +x direction and 4 units in +y direction then coordinates of point are (3, 4).

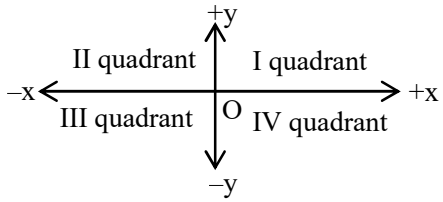
Here 3 is x coordinate or abscissa

and 4 is y coordinate or ordinate.



Note :

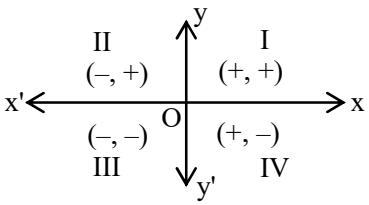
These two axes (lines) are perpendicular to each other and divide a paper (plane) in four equal parts, each part is called quadrant.



Coordinate of origin O are (0, 0).

Coordinate can be +ve or –ve.

Sign system in quadrant as follows.



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

Eg. (–5, 0) (2, 0) (7, 0) etc. are on x axis

On y axis, abscissa (x part) of any point is always 0.

Eg. (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 quadrand, Iq, on y axis, IIIq, IVq, IIIq, on x axis, origin.

◈ **Variable :** Quantity which change its value according to given condition or a number not having a fix value, called variable like x, y, z, t…

Independent and Dependent variable :

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

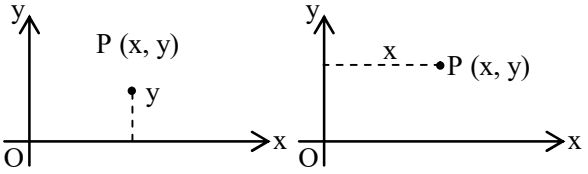
(1) Increase of time affects amount of interest. Here time is independent and interest is dependent variable.

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

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

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

Note : Distance is always positive



IMPORTANT POINTS TO BE REMEMBERED

1. The horizontal line is called x axis.
2. The veritical line is called y axis.
3. The intersection point of both axes is called origin whose coordinates are (0, 0).
4. The ordinate of point which lies on x-axis is always 0.
5. The abscissa of point which lies on y-axis is always 0.
6. For drawing linear graph we have to take suitable scale for both axes.
7. The sum of all angles at centre of circle is equal to 360°.
8. For making pie chart, we find angles for each item by formula $\frac{\text{ratio of given item}}{360°} \times \text{total}$.

EXERCISE

Q.1 Locate the following points on the graph paper A(–3, 4), B(4, 0), C(–5, –3), D(–4, –5), E(0, 5), F(0, –4), G(0, 2), H(–3, 0).

Q.2 Mark the following points and join them. Give name and other information about the figure.

(i) (–3, 0), (–3, 1), (–3, 2), (–3, 5), (–3, –2)

(ii) (5, 2), (3, 2), (0, 2), (–3, 2), (–1, 2)

(iii) (2, –2), (8, 4), (5, 7), (–1, 1)

(iv) (1, –2), (3, 6), (5, 10), (3, 2)

(v) (3, 0), (6, 4), (–1, 3)

Q.3 Find the distance of the following points from both x and y axis (0, 3), (5, –2), (–3, 4), (7, 3), (8, 17), (15, 3), (7, 7).

Q.4 Find the distance of the following points from origin (3, 4), (1, 1), (–5, –12), (9, 40).

Q.5 Find the distance between

(i) A(–5, 0) and B(7, 0)

(ii) P(0, 3) and Q(0, –2)

Q.6 Locate the following points on graph paper by taking suitable scale

(i) A(15, 25) (ii) B(15, –30)

(iii) C(–35, 25) (iv) D(–15, –20)

(v) E(–15, 35) (vi) F(25, 15)

(vii) G(–5, 0) (viii) H(0, 10)

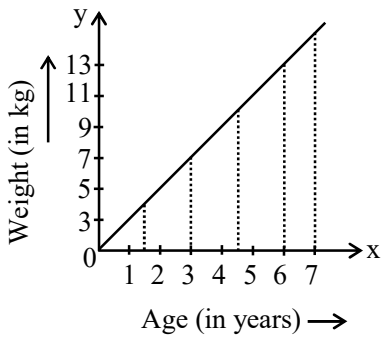
Q.7 In the given line graph, weight of a child according to age is given. Give answers of the following questions.

(i) What is the weight of child when age is 3 years.

(ii) What is the weight of child when age is 1 year 6 months and 4 years 6 months.

(iii) What is the age of child when weight is (1) 6 kg (2) 12 kg

(iv) The increase weight between 6 years to 7 years



Scale 1 cm = 1 year (x-axis)
1 cm = 2 kg (y-axis)

Q.8 The temperature for 6 months of a town as follows :

Month	Jan.	Feb.	Mar.	April	May	June
Temp. (in ºC)	15	18	24	32	39	40

Draw a line graph to represent the above information.

Q.9 Draw the line graph to represent the given information.

Age (in years)	10	12	14	16	18	20
Weight (in kg)	25	28	33	41	45	56

Q.10 Draw the histogram for the following information and find population of the year 1995.

Year	1970	1980	1990	2000	2010
Population (in laks)	16	20	23	27	32

Q.11 The number of workers in a factory as follows :

Year	1998	2000	2002	2004	2006	2008
Workers	220	260	340	480	600	800

Draw a histogram for the above information then find

(i) In which year, the number of workers is 300

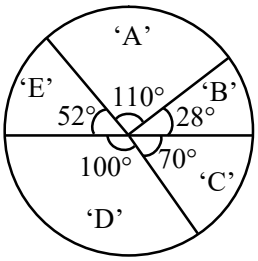
(ii) Number of workers in year 2003

Q.12 The temperature of a patient as follows

Time	8am	10am	12noon	2pm	8pm	9pm
Temp. in ^0C_p	37°	37.2°	37.8°	38°	39.2°	38.5°

Draw line graph for the above information and find the temperature at 9 am and 7 pm.

Q.13 According to the given figure give the answers of the following questions.



(i) Maximum expenditure on which quantity?

(ii) Minimum expenditure on which quantity?

(iii) If total expenditure is ₹ 270000 then find the expenditure on 'A'.

Q.14 The number of students in a school for classes 6, 7, 8, 9 and 10 are as follows :

Class	6	7	8	9	10
Students	216	156	136	132	80

Draw a pie chart to represent the above data.

Q.15

Subject	Hindi	Maths	Science	Eng.	S.ST.
Marks	140	180	160	126	114

Draw pie chart for above information.

Q.16 The monthly expenditure of a man are as follows.

Items,	Food	Educa-tion	House rent	Enterte-ntment	Others
Expendi-ture (%)	40%	30%	15%	10%	5%

Draw circle graph for above information.

ANSWER KEY

EXERCISE

2. (i) Line parallel to y-axis (ii) Line parallel to x-axis. (iii) Rectangle. (iv) Parallelogram (v) right angle triangle.

3. 3, 0 ; –2, 5 ; 4, –3 ; 3, 7 ; 17, 8 ; 3, 15 ; 7, 7 **4.** $5, \sqrt{2}, 13, 41$ units. **5.** (i) 12 (ii) 5

7. (i) 5 kg. (ii) 3 kg, 8 kg (iii) 2 years 6 months, 6 years (iv) 2 kg

10. 25 lak **11.** (i) 2001 (ii) 410 **12.** 37.1°C & 38°C

13. (i) 'A' (ii) 'B' (iii) ₹ 82500 **15.** Central angle : 70°, 90°, 80°, 63°, 57° respectively.

16. Angle at centre are 144°, 108°, 54°, 36°, 18° respectively.