Name : _____

Grade : VIII

Subject : Mathematics

Chapter : 15. Introduction to Graphs

1 Marks.

Objective Type Questions

I. Multiple choice questions

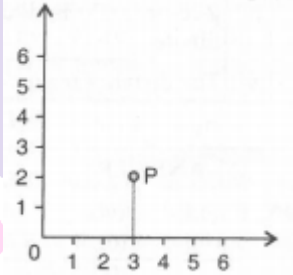
1. Comparison of parts of a whole may be done by a. [NCERT Exemplar]

a. bar graph b. pie chart c. linear graph d. line graph

2. A graph that displays date that changes continuously over periods of time is. [NCERT Exemplar]

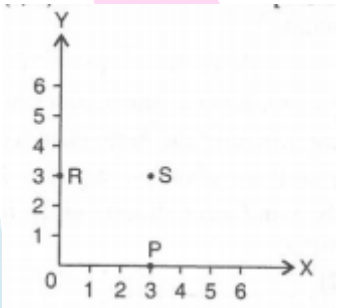
a. bar graph b. pie chart c. histogram d. line graph

3. In the given graph, the coordinates of point P are; [NCERT Exemplar]



a. (0,2) b. (2,3) c. (3,0) d. (3,0)

4. In the given graph, the letter that indicates the point (30,3) is ; [NCERT Exemplar]



a. P b. Q c. R d. S

5. The point (3, 4) is at a distance of: [NCERT Exemplar]

a. 3 form both the axes b. 4 from both the axes

c. 4 from the X-axis and 3 from Y-axis d. 3 from X-axis an from Y-axis

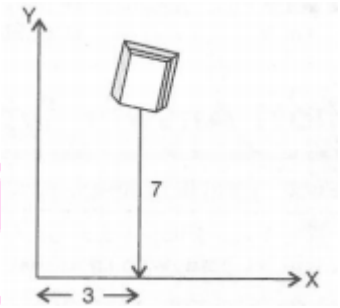
6. A point which lies on both the axes is [NCERT Exemplar]

a. (0, 0) b. (0, 1) c. (1,0) d. (1, 1)

7. The coordinates of a point at a distance of 3 units from the X-axis and 6 units from the Y-axis are: [NCERT Exemplar]

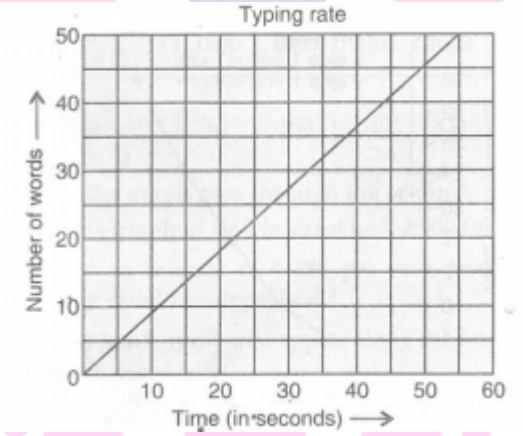
a. (0,3) b. (6, 0) c. (3, 6) d. (6, 3)

8. In the given figure, the position of the book on the table may be given by: **[NCERT Exemplar]**



a. (7, 3) b. (3, 7) c. (3, 3) d. (7, 7)

9. Data was collected on a student's typing rate and graph was drawn as shown below.
Approximately how many words had this student typed in 30s? **[NCERT Exemplar]**



a. 20 b. 24 c. 28 d. 34

10. The coordinates of the origin are:

a. (0, 0) b. (1, 0) c. (0, 1) d. (1, 1)

11. What are the coordinates of a point whose x −coordinate is 3 and y −coordinates is 4?

a. (3, 3) b. (3, 4) c. (4, 3) d. (4, 4)

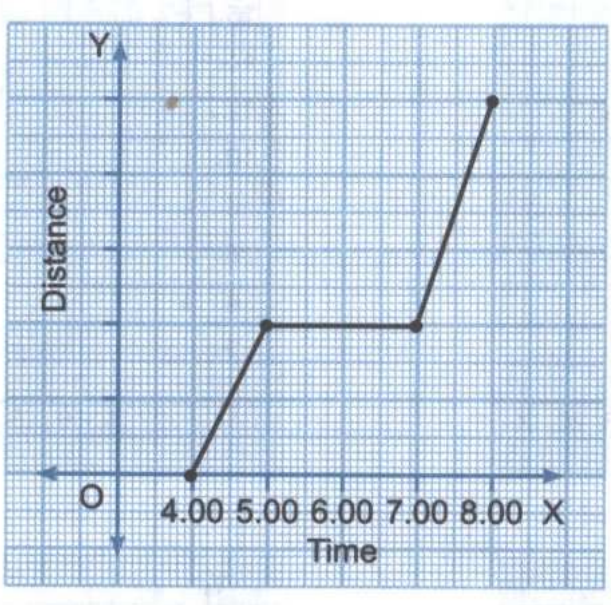
12. What are the coordinates of a point whose x −coordinate is 1 and y − coordinate is 0/

a. (1, 0) b. (0, 0) c. (0, 1) d. (1, 1)

1. b	2. d	3. c	4. c	5. c	6. a
7. d	8. b	9. c	10. a	11. b	12. a

II. Multiple choice questions

1. The given graph shows Nisha's trip to a mall by a car. Observe the graph carefully and find what was she doing between 5 pm and 7 pm?



a) Driving to the mall
b) Driving back home
c) Was not driving
d) not enough data to answer

2. Comparison of parts of a whole may be done by a

a) Bar graph
b) Pie chart
c) Linear graph
d) line graph

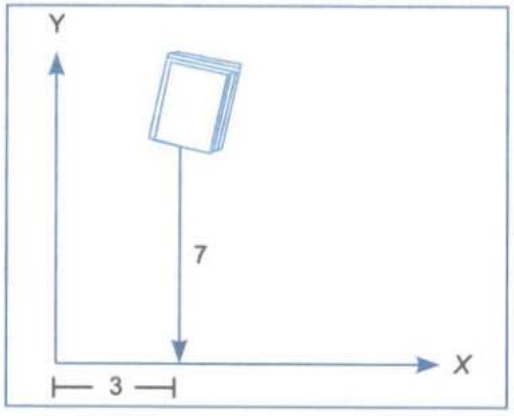
3. a graph that displays data that changes consciously over periods of time is

a) Bar graph
b) Pie chart
c) Histogram
d) line graph

4. The point (3, 4) is at a distance of

a) 3 from both the axis
b) 4from both the axis
c) 4 from the x axis and 3 from y axis
d) 3 from x axis and 4 from y axis

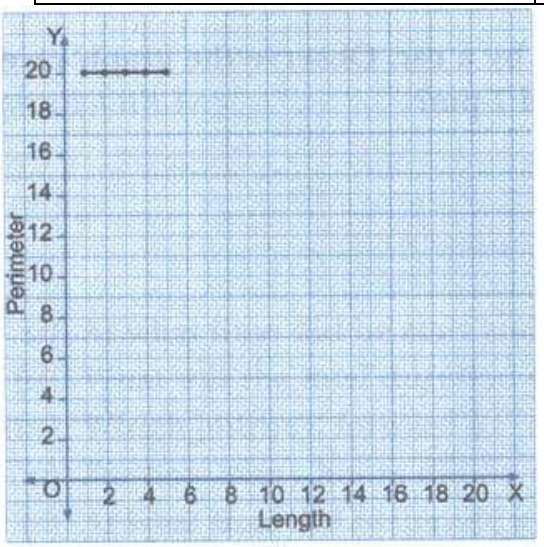
5. In the given figure the position of the book on the table may be given by



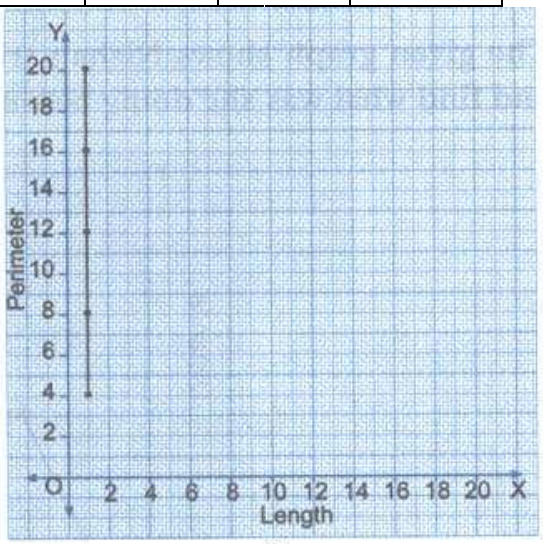
a) (7, 3)
b) (3, 7)
c) (3, 3)
d) (7, 7

6. Which of the following graphs represent the table below?

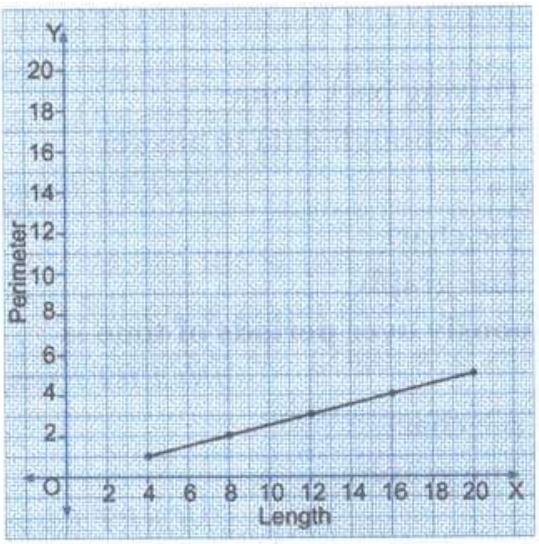
Length of side of a square	1	2	3	4	5
Perimeter	4	8	12	16	20



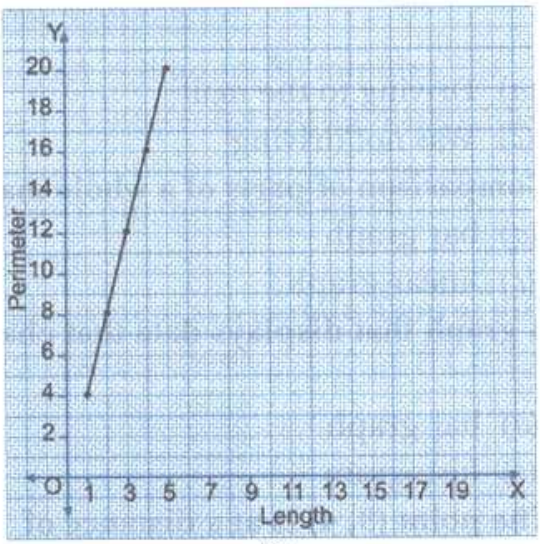
(a)



(b)



(c)



(d)

7. The point (4,-3) lies in which quadrant ?

a) I quadrant b) II Quadrant c) III quadrant d) IV Quadrant

8. The equation representing x axis is

a) $x = 0$ b) $y = 0$ c) $x = a$ d) $y = b$

9. The Coordinates of a point whose abscissa is -1 and ordinate is one more than twice of abscissa are

a) $\left(\frac{1}{6}, 6\right)$ b) $\left(6, \frac{1}{6}\right)$ c)(-6,6) d) (6,-6)

10. The coordinate of a point whose abscissa is -1 and ordinate is one more than twice of abscissa are

a) (-1,0) b) (-1,2) c) (2,-1) d) (-1,-1)

1. c	2. b	3. d	4. c	5. b	6. d	7. d	8. b	9. c	10. d

I. Fill in the blanks

1. All points with y −coordinate as zero lie on the _____. [NCERT Exemplar]
2. The graph of $y = a$ is _____. [NCERT Exemplar]
3. For the point (5, 2), the distance from the X-axis is _____ units. [NCERT Exemplar]
4. The x − coordinate of any point lying on the y − axis will be _____. [NCERT Exemplar]
5. The y −coordinate of the point (2, 4) is _____. [NCERT Exemplar]

1. $x - axis$	2. line parallel to the $x - axis$	3. 3
4. zero	5. 4	

I. True or False

1. The coordinates of the origin are (0, 0). [NCERT Exemplar]
2. The distance of any point from the X-axis is called the x-coordinate. [NCERT Exemplar]
3. The y-coordinate of any point lying on the X-axis will be zero. [NCERT Exemplar]
4. In the point (2, 3), 3 denotes the y-coordinate. [NCERT Exemplar]
5. The ordinate of a point is its distance from the Y-axis. [NCERT Exemplar]

1. True	2. False	3. True	4. True	5. False

I. Match the following

a. (0, 5)	i. y-coordinates = 2 x x −coordinate + 1
b. (2, 3)	ii. Coodinates of origin.
c. (4, 8)	iii. Only y −coordinate is zero.
d. (3, 7)	iv. The distance from X-axis is 5.
e. (0, 0)	v. y −coordinate is double of x −coordinate
f. (5, 0)	vi. The distance from Y-axis is 2.

a. iv	b. vi	c. v	d. i	e. ii	f. iii

I. Very short answer type questions.

1. Where will a point lie whose y-coordinate is zero?

On $x-axis$.

2. Where will the point with coordinates (0,0) lie?

At the point of intersection of the x and y-axes.

3. Write the x-coordinate (abscissa) of each of the given points.

a. (7, 3) b. (5, 7) c. (0, 5)

a. The x-coordinate of the point (7, 3) is 7.

b. The x −coordinate of the point (5, 7) is 5.

c. The x-coordinate of the point (0, 5) is 0.

4. Write the y −coordinate (ordinate) of each of the given points.

a. (3, 5) b. (4, 0) c. (2, 7)

a. The y-coordinate of the point (3, 5) is 5.

b. The y-coordinate of the point (4, 0) is 0.

c. The y −coordinate of the point (2, 7) is 7.

5. Write the x and y coordinates of the following sets of numbers.

a. A(-3, 2) b. B(2, -1) c. C(0, -7)

(Or)

Write down the x −coordinate and y −coordinate of each of the following points.

a. A(0, 5) b. B(-6, -4) c. C(2, 2)

a. $A, x = -3, y = 2$

b. $B, x = 2, y = -1$

c. $C, x = 0, y = -7$

(Or)

a. $A, x = 0, y = 5$

b. $B, x = -6, y = -4$

c. $C, x = 2, y = 2$

6. Write down the y-coordinate of each of the following points.

a. A(-7, 6) b. B(-5, 0)

c. P(2, 2) d. S(-2, -3)

Sol. a. 6 b. 0

c. 2 d. -3

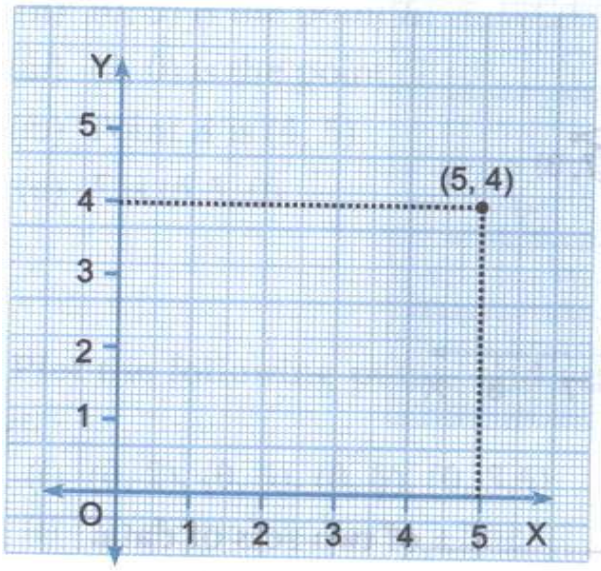
II. Very short answer type questions.

1. Plot the given points on a graph sheet.

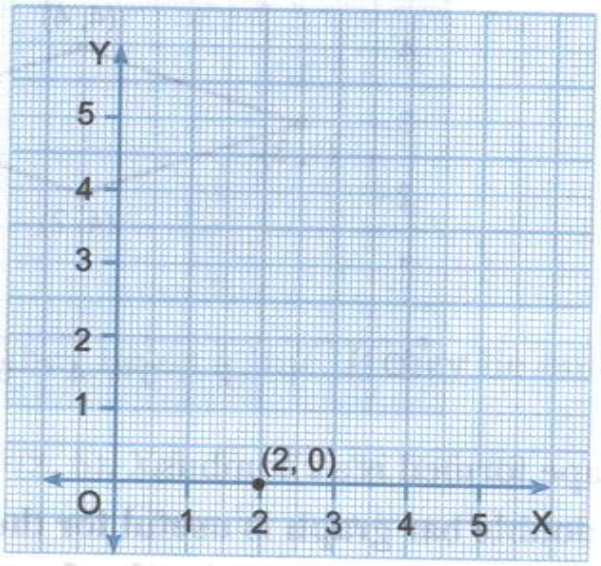
a) (5, 4) b) (2, 0)

Sol.

(i) (5, 4)



(ii) (2, 0)



2. Write the x- coordinate (abscissa) of the given points.

(i) (7, 3) (ii) (5, 7)

Sol:

(i) We know the point on graph is denoted by (x, y) and x- coordinate is abscissa

Point (7, 3) →7 is the x- coordinate

(ii) For the point (5, 7), 5 is the x- coordinate

3. Write the y – coordinate (ordinate) of each of the given points

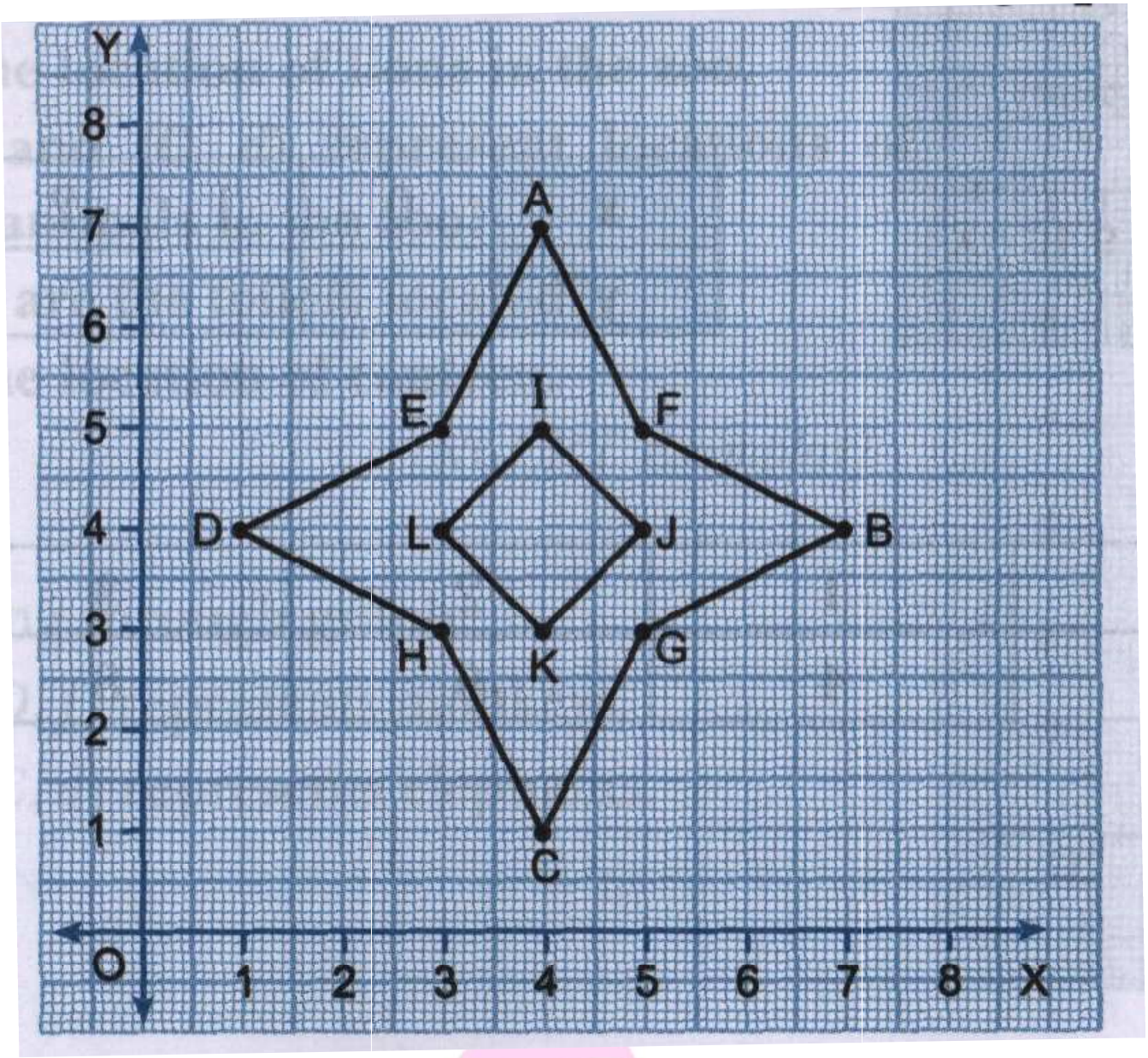
a) (3, 5) b) (4, 0)

Solution:

(a) We know the point on graph is denoted by (x, y) and y- coordinate is called ordinate. Point (3, 5) Here, 5 is the y – coordinate

(b) For the point (4, 0) here, 0 is the y – coordinate.

4. Write the coordinate of all the points in the given grapgh



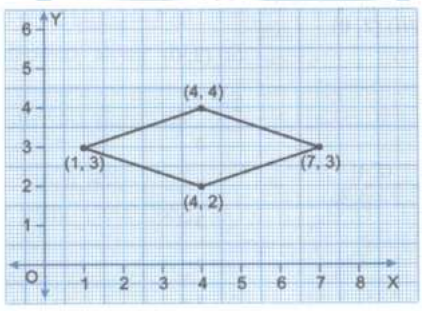
Sol:

(A) (4, 7) (B) (7, 4) (C) (4,1) (D) (1,4) (E) (3,5) (F) (5,5) (G) (5,3)

(H) (3,3) (I) (4,5) (J) (5,4) (K) (4,3) (L) (3,4)

5. Plot the points (4,4) ,(1,3),(4,2) and (7,3) on a paper and connect them with line segments . Name the shape formed by these points.

Solu:



The shape formed is a rhombus.

6.

(i) a double bar graph is useful for the _____ of two sets of data.

(ii) Data represented in a circular from is called a _____ chart.

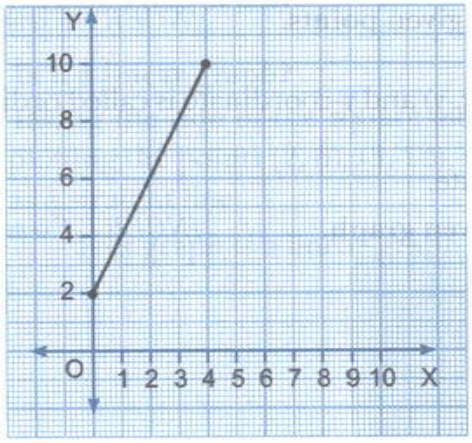
(iii) The graph of a linear equation is always a _____ line.

(iv) The Cartesian system used two axes which are _____ to each other.

Sol:

(i) Comparison (ii) Pie (iii) straight (iv) Perpendicular

7. Study the given graph and complete the corresponding table below.



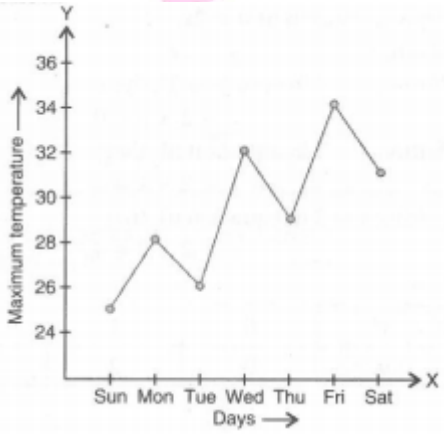
x	0	1	2	3	4
y					

Sol.

x	0	1	2	3	4
y	2	4	6	8	10

I. Short answer type questions.

1. Study the graph and answer the question that follow.



a. What information does the graph give?

b. On which day was the temperature the least?

c. On which day was the temperature 31°C?

d. Which was the hottest day? **[NCERT Exemplar]**

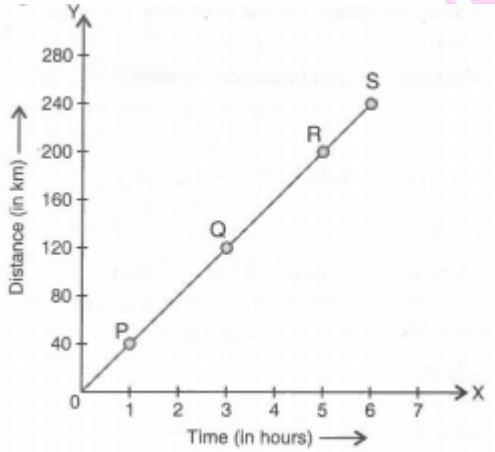
Sol. a. The information obtained from the given graph is that the maximum temperature is 34^0C and minimum temperature is 25^0C in a week.

b. On Sunday, the temperature was 250C. it is the least temperature in the week.

c. On Saturday, the temperature was 31^0 C.

d. On Friday, the temperature was maximum i.e.34^0C. Hence, it is the hottest day of the week.

2. Study the distance-time graph given below for a car to travel to certain places and answer the questions that follow.



a. How far does the car travel in 2-h?

b. How much time does the car take to reach R?

c. How far is Q from the starting point?

d. When does the car reach the place S after starting? **[NCERT Exemplar]**

Sol. a. From the given graph, the car travels 80 km in 2 h.

b. 5 h are taken by car to reach R.

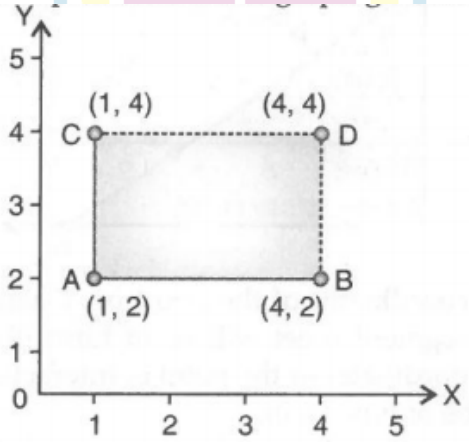
c. 2 h are taken by car to cover 80 km.

d. Q is 120 km far from the starting point.

e. The car reaches the places after starting in 6 h.

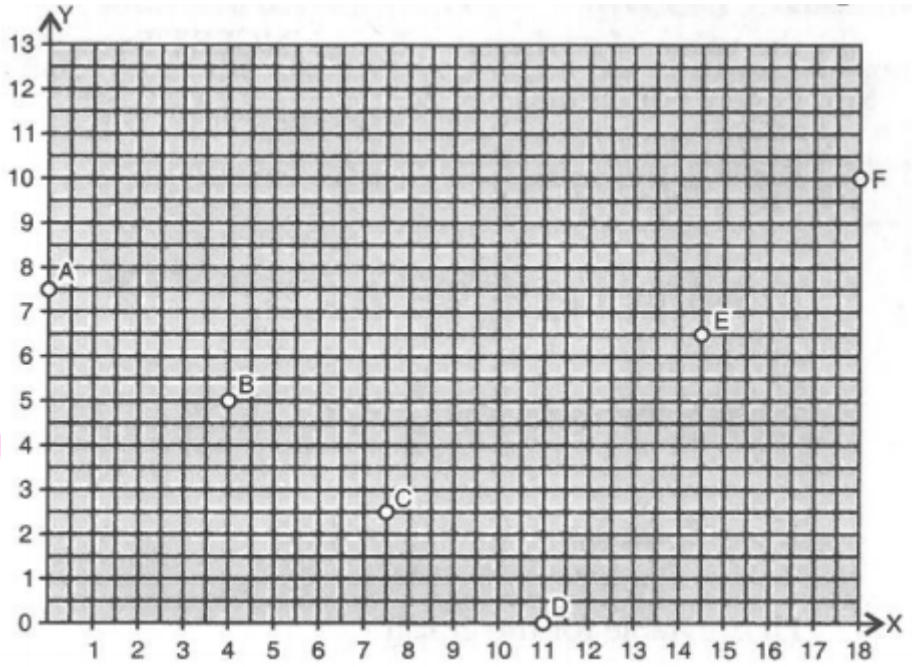
3. Locate the points A(1, 2), B(4, 2) and C(1, 4) on a graph sheet taking suitable axes. Write the coordinates of the fourth point D to complete the rectangle ABCD. **[NCERT Exemplar]**

Sol. Given, points are A(1, 2), B(4, 2) and C(1, 4). Location of given points on of the graph given below.



To complete the rectangle ABCD, the coordinate of the fourth (4, 4), i.e., D(4. 4)

4. Find the coordinate of all letters in the graph given below. **[NCERT Exemplar]**



Sol. The point A is on the Y-axis at a distance of 7.5 from the orgin.

$\therefore$ The coordinate are (0, 7.5).

The point B is at a distance of 4 units from $Y - axix$ and 5 units from X-axxis.

$\therefore$ The coordinates of B are (4,5)

The point C is at a distance of 7.5 units from $Y - axis$ and 2.5 units from X-axis.

$\therefore$ The coordinate of C denotes (7.5, 2.5).

The point D lies on $X - axis$ at a distance of 11 units from the origin.

$\therefore$ The coordinate of D are (11, 0).

The point E is a distance of 14.5 units from $Y - axis$ and 6.5 units from $X - axis$.

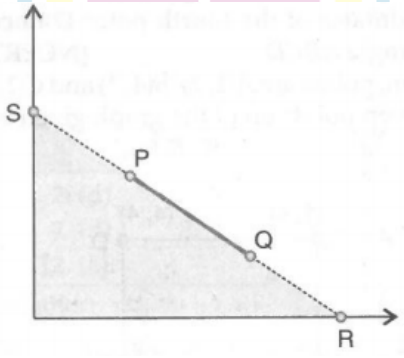
$\therefore$ The coordinates of E are (14.5, 6.5).

The point F is at a distance of 18 units from $Y - axis$ and 9.5 units from $X - axis$.

$\therefore$ The coordinates of F are (18, 9.5).

5. Extend the line segment on both sides to meet the coordinate axes. What are the coordinate of the points, where this line meets the X-axis and the Y-axis? **[NCERT Exemplar]**

Sol. Let PQ is a line segment which is extend from both ends to meet the axes.



The coordinates o the point on Y-axis, where the lines segment meet will be of form (0, y) whereas the coordinates of the point of interaction on X-axis will be of type (x, 0).

6. Plot a line graph for the variables p and q, where p is two times Q i.e., the equation is $p = 2Q$. Then, find.

a. the value of p when $q = 3$

b. the value of when $p = 8$

Sol. Given, equation is $p = 2q$

If $p = 2, then\ q = \frac{p}{2} = \frac{2}{2} = 1$

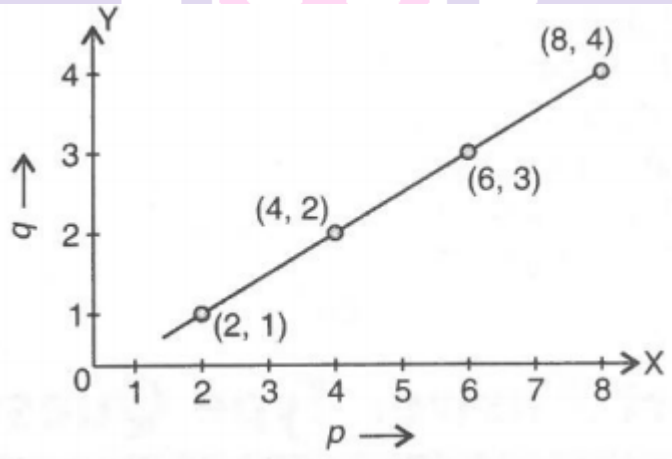
If $p = 4, then\ q = p.2 = \frac{4}{2} = 2$

If $p = 6, then\ q \frac{p}{2} = \frac{6}{2} = 3$

If $p = 8, then\ q = \frac{p}{2} = \frac{8}{2} = 4$

Hence, table for the graph

P	2	4	6	8
Q	1	2	3	4



a. $When\ q = 3, the\ value\ of\ p\ is\ 6.$

b. $When\ p = 8, the\ value\ of\ q\ is\ 4$

7. Draw the graph of$y = 2x$.

Sol. Given, $y = 2x$

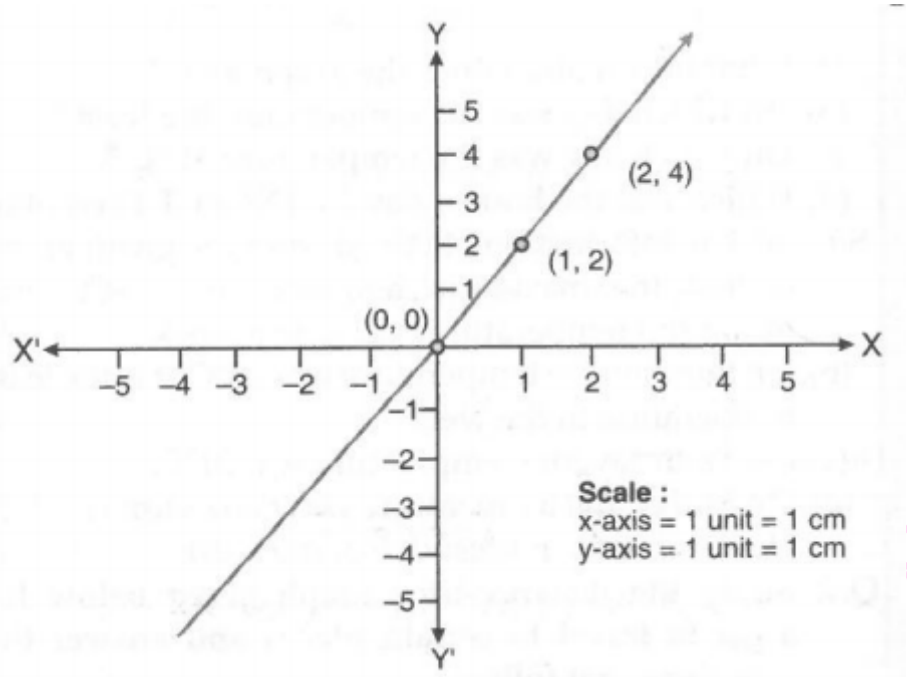
Putting $x = 0$ in equation (i), then $y = 2 \times 0 = 0$

Putting $x = 1$ in equation (i), then $y = 2 \times 1 = 2$

Putting $x = 2$ in equation (i), then $y = 2 \times x = 4$

Thus,

x	0	1	2
Y	0	2	4



8. Draw the graph of the function $y = -3x$.

Sol. Given, $y = -3x$

Putting $x = 0$ in equation (i), then

$y = -3 \times 0 = 0$

Or $y = 0$

Putting $x = 1$, in equation (i), then

$y = -3 \times 1 = -3$

Or $y = -3$

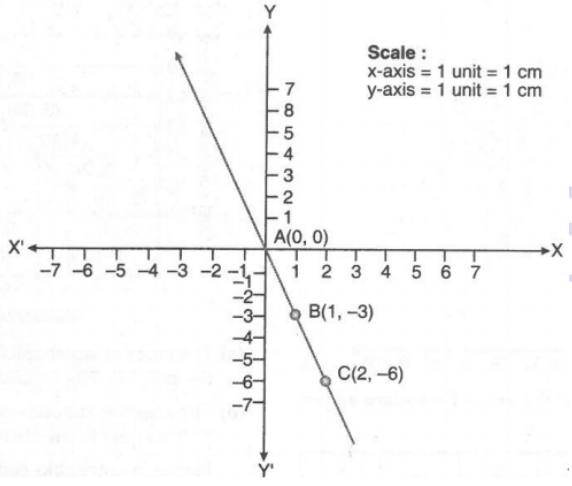
Putting $x = 2$, in equation (ii), then

$y = -3 \times 2 = -6$

$y = -6$

Thus,

x	0	1	2
Y	0	-3	-6

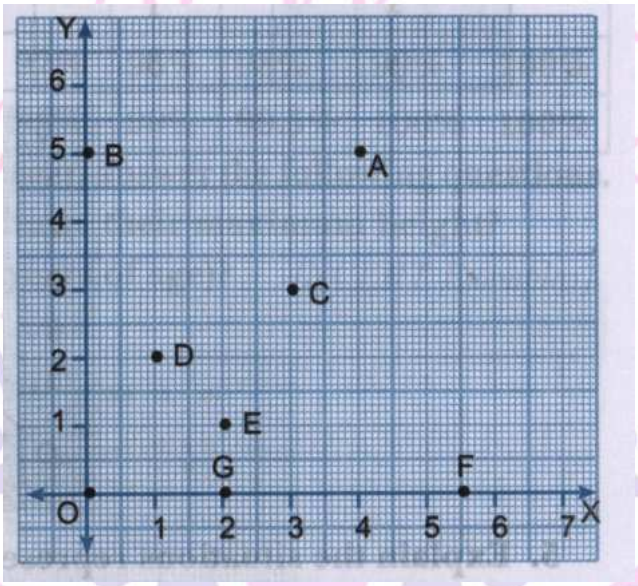


II. Short Answer Type Questions.

1. From figure, choose the letters that indicate the location of the points given below

(i) (2, 1) (ii) (0, 5) (iii) (2, 0) also write

(iv) The coordinates of A. (v) The coordinates of F.



Solution:

(i) (2,1) is the point E9it is not D

(ii) (0, 5) is the point B.

(iii) (2, 0) is the point G.

(iv) Point A is (4, 5)

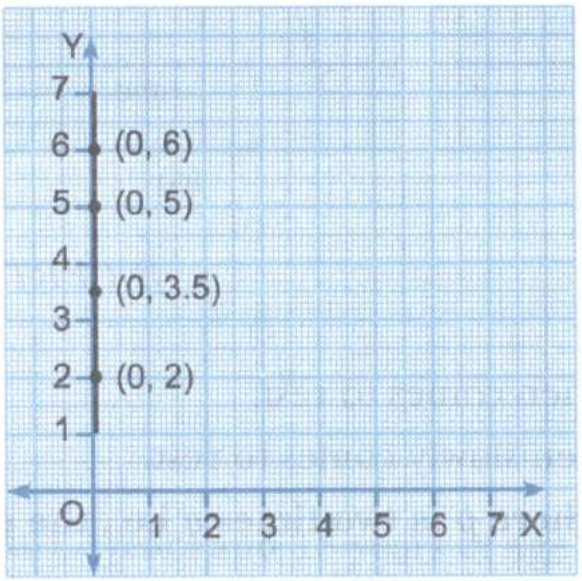
(v) F is (5.5, 0)

2. Plot the following points and verify if they lie on a line. If they lie on a line, name it.

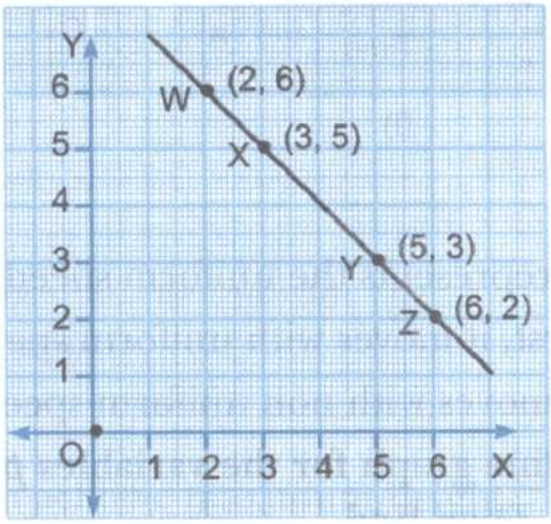
(i) (0,2),(0,5),(0,6),(0,3.5) (ii) W (2,6), x (3,5), Y (5,3) ,Z (6,2)

Solution:

(i) These points lie on a line the line is y – axis



(ii) These lie on a line .We can name it as XY or WX or YZ etc.



3. Study the given map of a zoo and answer the following questions.

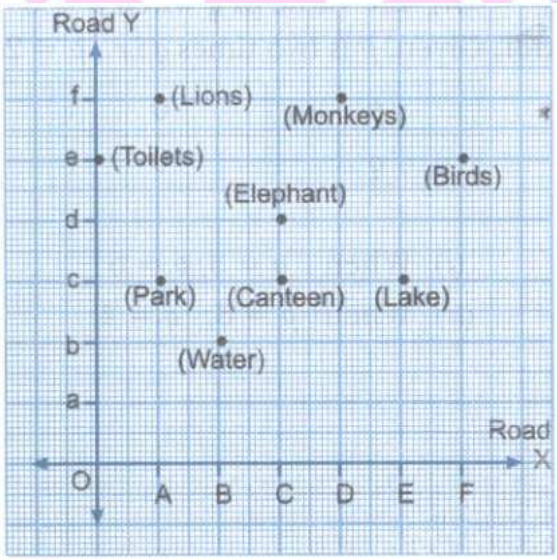
(i) Give the location of lions in the zoo.

(ii) (D, f) and (C, d) represent locations of which animal in the zoo?

(iii) Where are the toilets located?

(iv) Give the location of canteen.

Solution:



(i) (A, f)

(ii) Buy seeing through graph. Point (D, f) represents monkeys. Point (C, d) represent elephants.

(iii) (O, e)

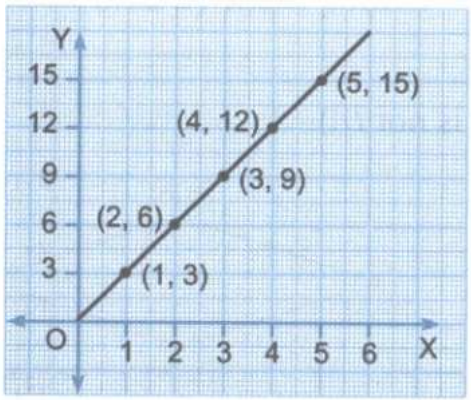
(iv) (C, c)

4. If y – coordinate is 3 times of x – coordinate, from a table for it and draw a graph.

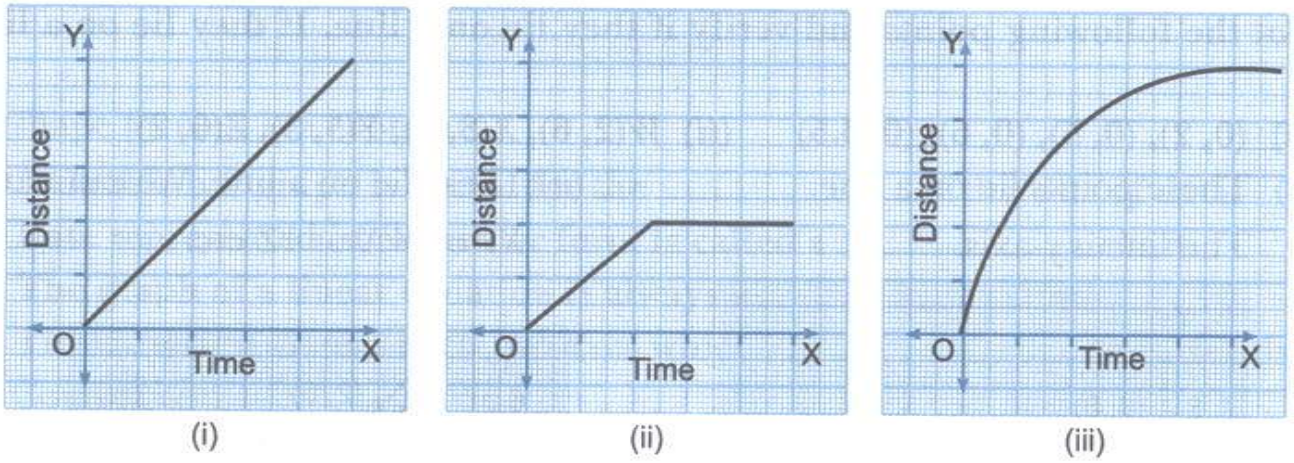
Solution:

Given: y coordinate is 3 times of x coordinate i.e , y = 3x

x	1	2	3	4	5
y	3	6	9	12	15



5. Explain the situation represented by the following distance – time graphs.



Solution:

(i) It represents the uniform speed

(ii) First, it moves with uniform speed and then comes to rest.

(iii) It moves with non-uniform speed and then slowly comes to rest.

6. Plot a line graph for the variables p and q where p is two times q i.e., the equation p = 2q . Then find

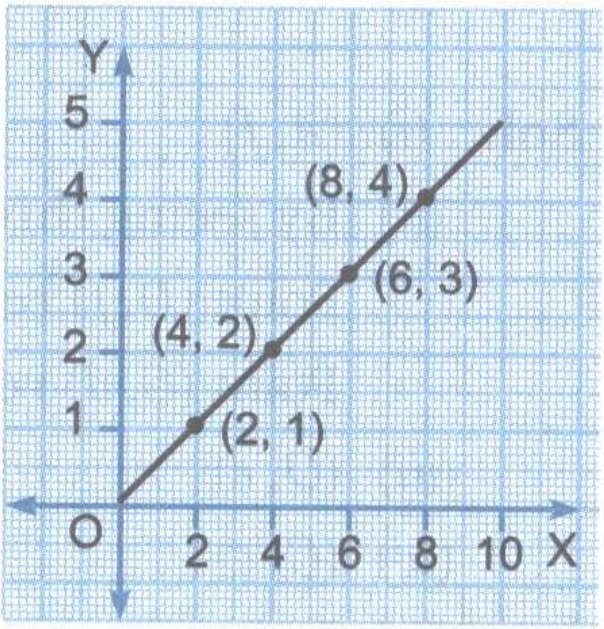
(i) The value of p when q=3

(ii) The value of q when p = 8.

Solution:

Given, p is two times q i.e., p = 2q

P	0	2	4	6	8
Q	0	1	2	3	4



7. The following chart gives the growth in height in terms of percentage of full height of boys and girls with their respective ages.

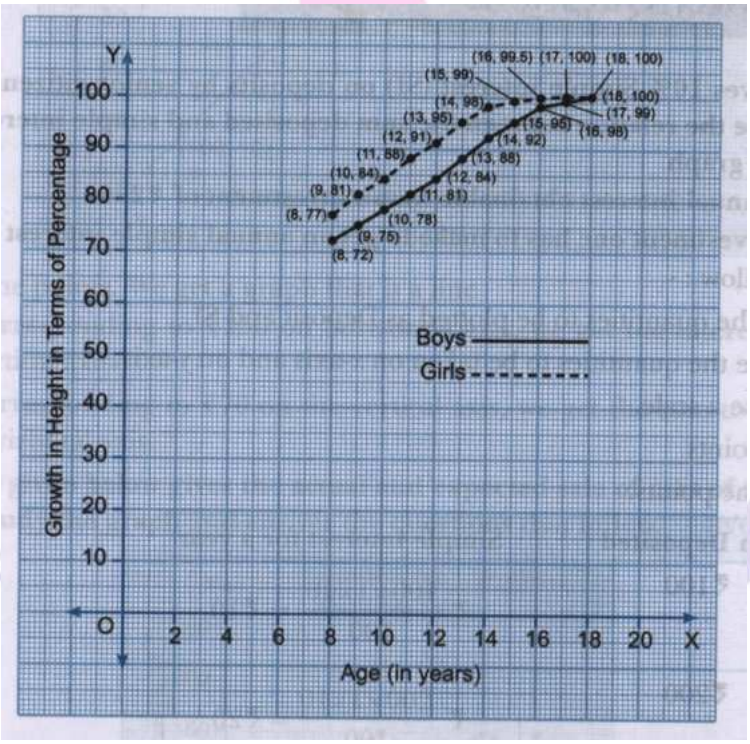
Age (in years)	8	9	10	11	12	13	14	15	16	17	18
Boys	72%	75%	78%	81%	84%	88%	92%	95%	98%	99%	100%
Girls	77%	81%	84%	88%	91%	95%	98%	99%	99.5%	100%	100%

Draw the line graph of above data on the same sheet and answer the following questions.

(i) In which year both the boys and the girls achieves their maximum heights?

(ii) Who grows faster at puberty (14 years to 16 years of age)

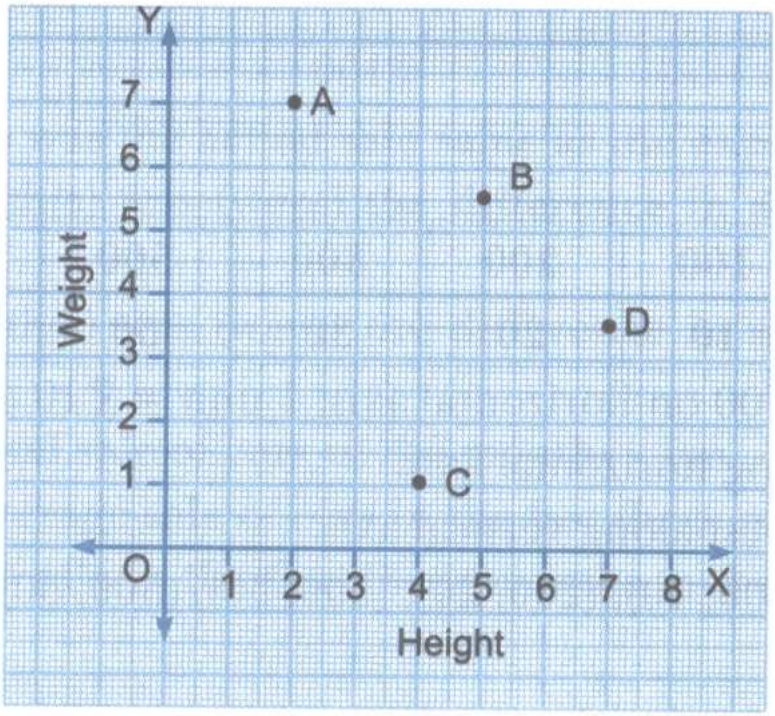
Solution:



(i) At 17 years and 18 years of age they both achieve maximum height.

(ii) Boys grow faster at the age of 14 years to 16 years (puberty)

8. The points on the graph below represent the height and weight of the donkey, dog , crocodile, and ostrich shown in the drawing.



(i) What are the two variables represented in the graph?

(ii) Which point represents each animal? Explain.

Solution:

(i) Height and weight are the two variables represented in the graph

(ii) A → Crocodile (least height and highest weight)

B → Donkey (average height and weight)

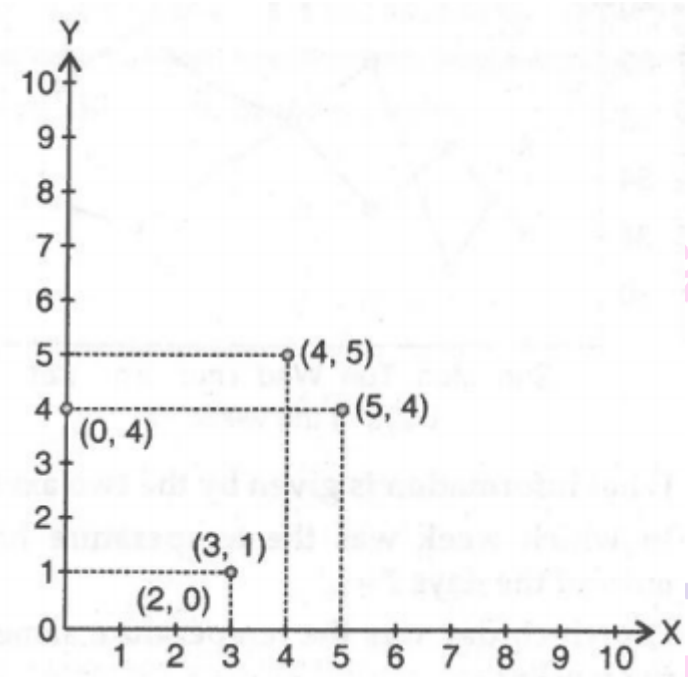
C → Dog (Less height and weight as compared to others)

D → Ostrich (More height, less weight)

I. Long Answer Type Questions.

1. Plot the given point on a graph sheet (a), (5, 4), (b) (2, 0), (c) (3, 1), (d) (0, 4), d (4, 5).

[NCERT Exemplar]



2. The following table gives the growth chart of a child.

Height (in cm)	75	90	110	120	130
Age (in years)	2	4	6	8	10

Draw a line graph for the table and answer the questions that follow.

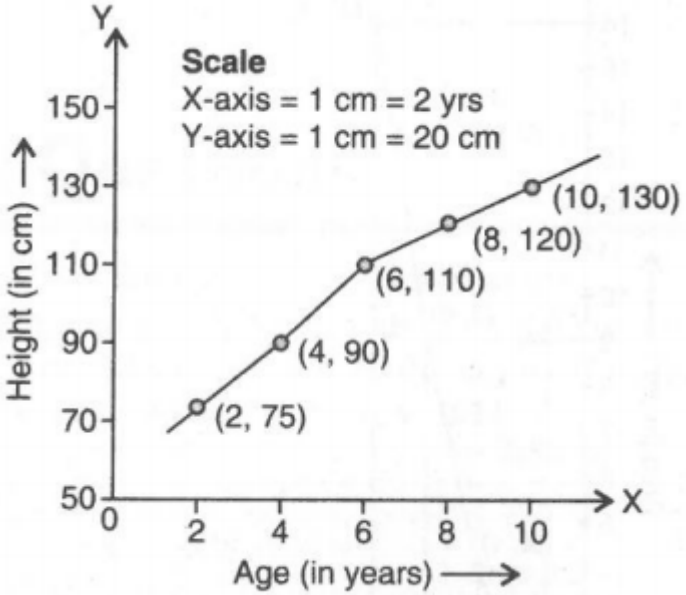
a. What is the height at the age 4 year?

b. How much taller was the child at the age of 10 year than at the age of 6 years?

c. Between which two consecutive periods did the child grow more faster?

[NCERT Exemplar]

Sol.



a. 90 cm

b. 130 cm – 110 cm

= 20 cm

c. 4 to 6 yrs

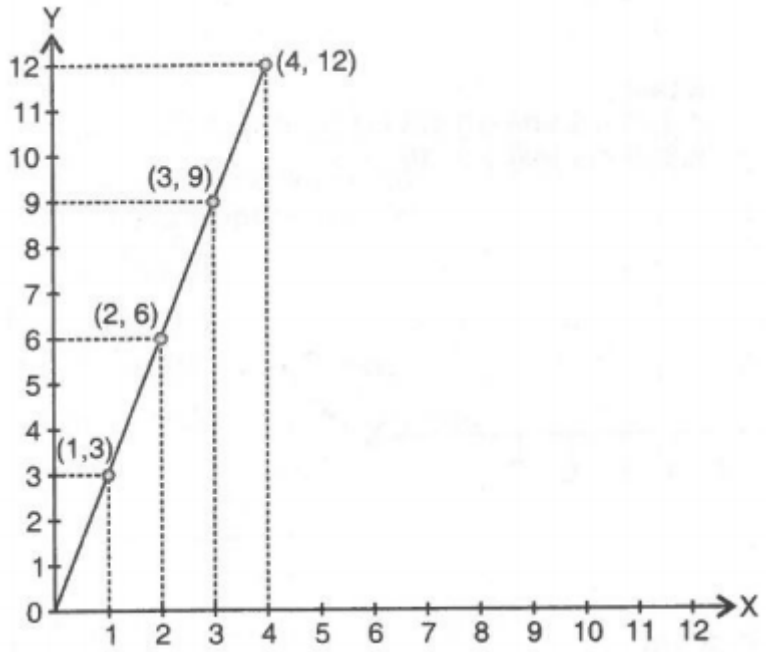
= 20 cm.

3. If *y*-coordinate is 3 times *x*-coordinate, form a table for it and draw a graph.

[NCERT Exemplar]

Sol. Since, the ordinate is 3 times the abscissa, we get the following values.

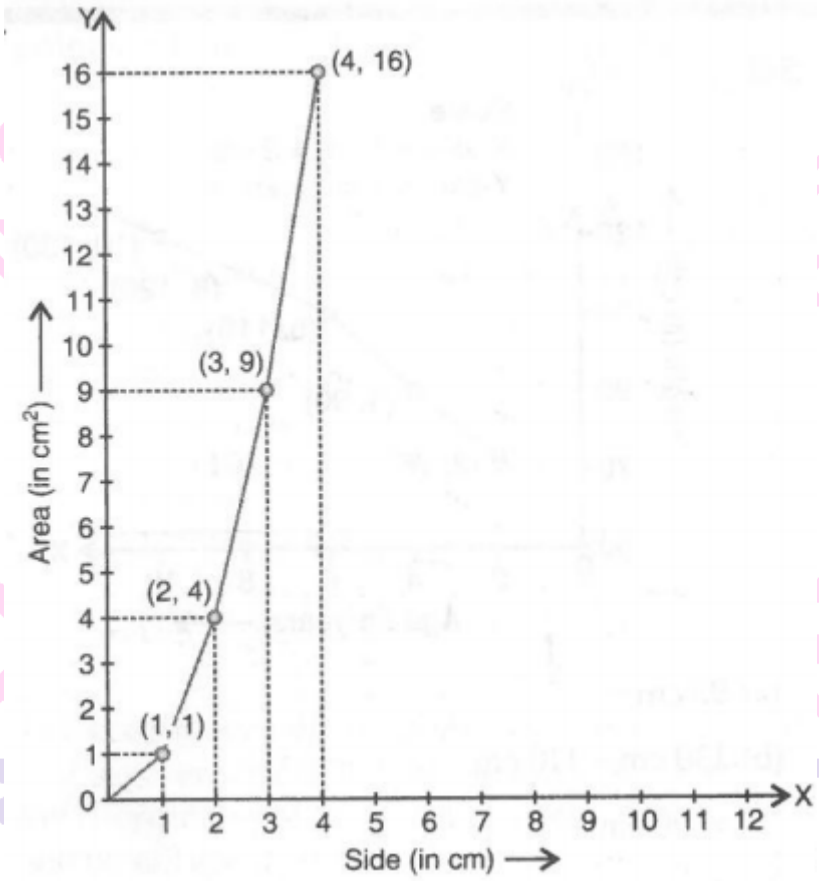
x	1	2	3	4
Y	3	6	9	12



4. Make a lines graph for the area of a square as per given table.

Side (in cm)	1	2	3	4
Area (in cm^2)	1	4	9	16

Sol.



Yes, it is a linear graph.

5. The cost of a notebook is Rs.10. Draw a graph after making a table showing cost of 2, 3, 4 ... notebooks. Use it to find.

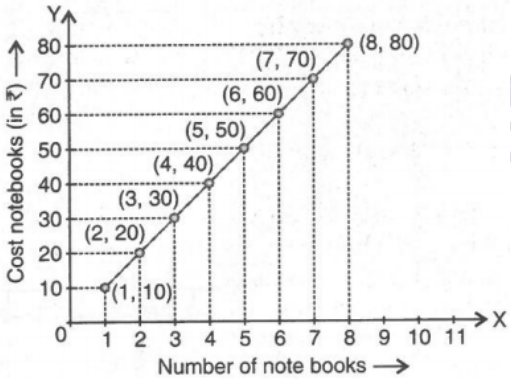
a. the cost of 7 notebooks.

b. the number of notebooks that can be purchased for Rs.50. **[NCERT Exemplar]**

Sol. Let x : number of notebooks.

y: Cost of a notebook.

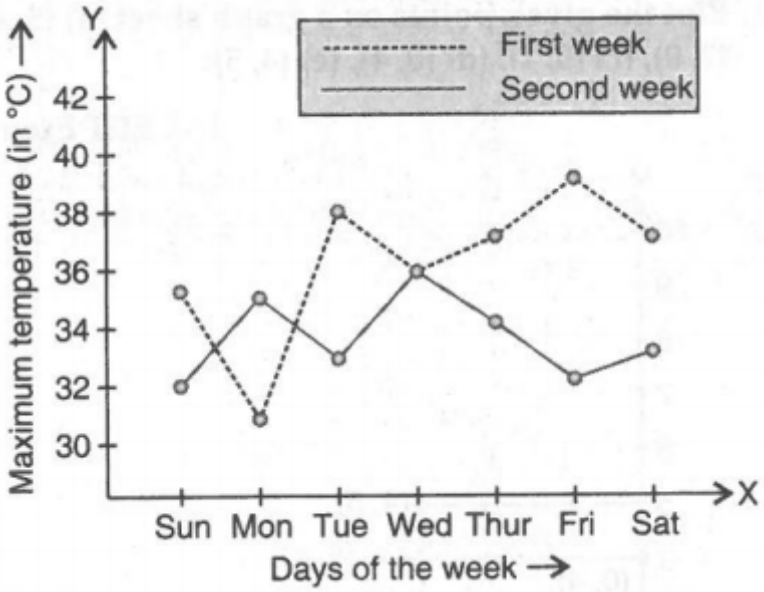
x	1	2	3	4	5	6	7	8
y	10	20	30	40	50	60	70	80



a. The cost of 7 notebooks is equal to the coordinate of the point (7, 70), i.e. cost of 7 notebooks = Rs.70.

b. The number of notebooks that can be purchased for Rs.50 is equal to the abscissa of the point (5, 50).

6. The graph show the maximum temperature recorded for two consecutive weks of a town. Study the graph and answer the questions that follow.



a. What information is given by the two axes?

b. In which week was the temperature higher on most of the days?

c. On which day was the temperature same in both the weeks?

d. On which day was the difference in temperatures the maximum for both the weeks?

e. What were the temperatures for both the weeks on Thursday?

f. On which day was the temperature 35^{0}C for the first week?

g. On which day was the temperature highest for the second week?

[NCERT Exemplar]

Sol. a. The X-axis represents days of a particular week and the Y-axis represents the maximum temperature (in ^{0}C) recorded.

b. Observing the graph, we see that in the first week temperature was higher on most of the days.

c. The temperature was same on Wednesday in both the weeks.

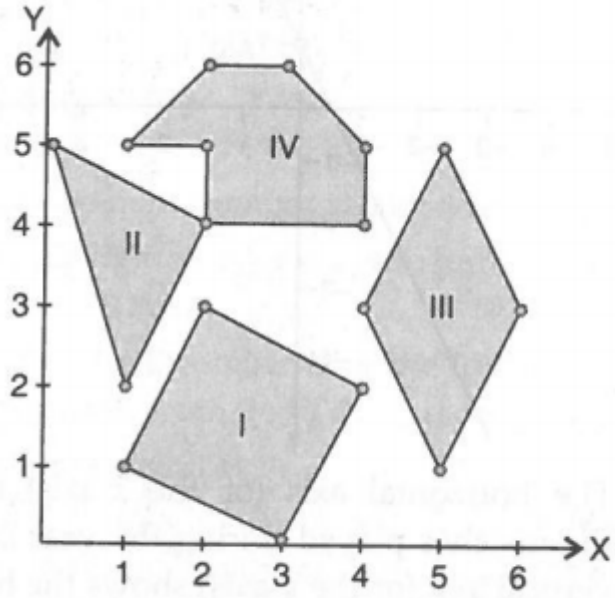
d. The difference in temperature was the maximum on Friday for both the weeks.

e. The temperature for the first week on Thursday was 37^{0}C and the temperature for the second week on the same day was 34^{0}C.

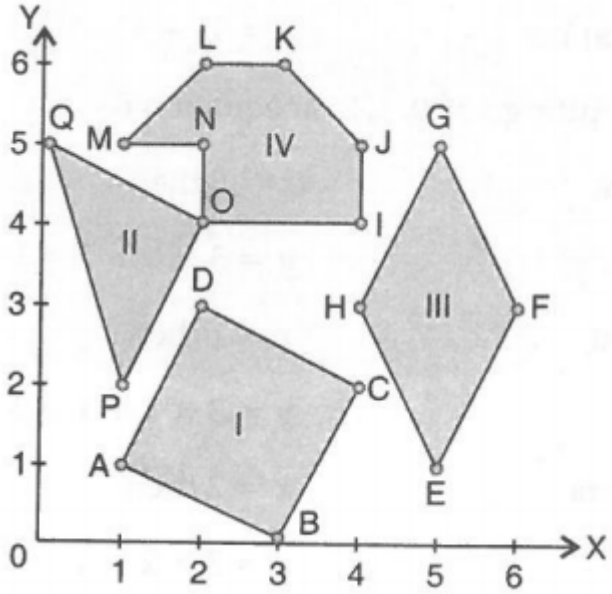
f. On Sunday, the temperature was 35^0 for the first week.

g. On Wednesday, the temperature was highest for the second week.

7. Find the coordinates of the vertices of the given figures.



[NCERT Exemplar]



Sol.

A. (1, 1)	B. (3, 0)	C. (4, 2)	D. (2, 3)	E. (5, 1)	F. (6, 3)	G. (5, 5)	H. (4, 4)	I. (4, 4)
J. (4, 5)	K. (3, 6)	L. (2, 6)	M. (1, 5)	N. (2, 5)	O. (2, 4)	P. (1, 2)	Q. (0, 5)	

II. Long Answer Type Questions

1. A bank gives 10 % Simple interest (SI) on deposits by senior citizens. Draw a graph to illustrate the relation between the sum deposited and simple interest earned. Find from your graph

(a) the annual interest obtainable for an investment of Rs.250

(b)The investment one has to make to get an annual simple interest of Rs.70.

Solution:

Step to follow:

(i) Find the quantities to be plotted as Deposit and SI.

(ii) Decide the quantities to be taken on x- axis and y – axis.

(iii) Choose a scale

(iv) Plot points.

(v) Join the points.

Sum Deposited	Simple interest for a year
Rs.100	Rs. $\frac{100 \times 1 \times 10}{100}$ = Rs.10
Rs.200	Rs. $\frac{200 \times 1 \times 10}{100}$ = Rs.20
Rs.300	Rs. $\frac{300 \times 1 \times 10}{100}$ = Rs.30
Rs. 500	Rs. $\frac{500 \times 1 \times 10}{100}$ = Rs.50
Rs.1000	Rs.100

We get a table of values.

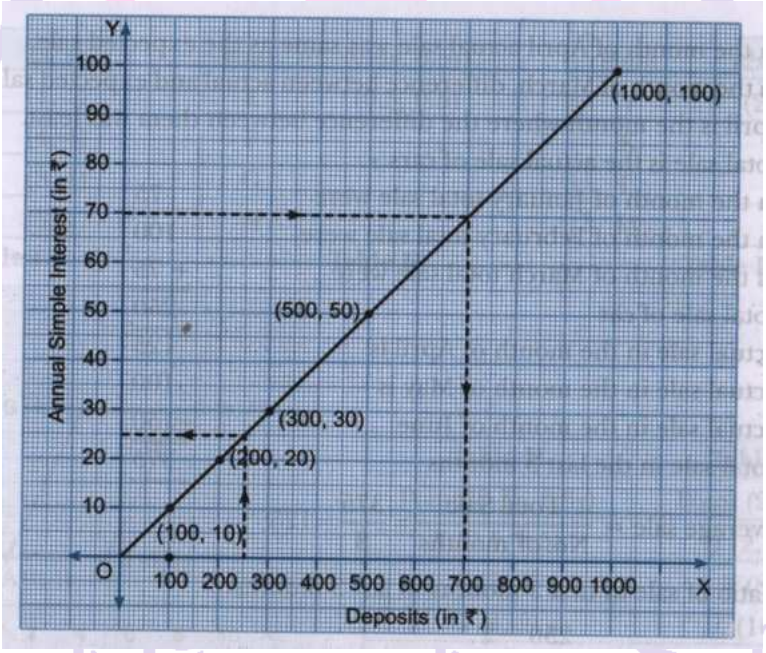
Deposits (in Rs)	100	200	300	500	1000
Annual S.I (in Rs)	10	20	30	50	100

(i) Scale: 1 unit = Rs.100 on horizontal axis; 1 unit = Rs.10 on vertical axis.

(ii) Mark Deposits along horizontal axis.

(iii) Mark simple interest along vertical axis.

(iv) Plot the points : (100,0), (200,20) ,(300,30), (500,50) etc.

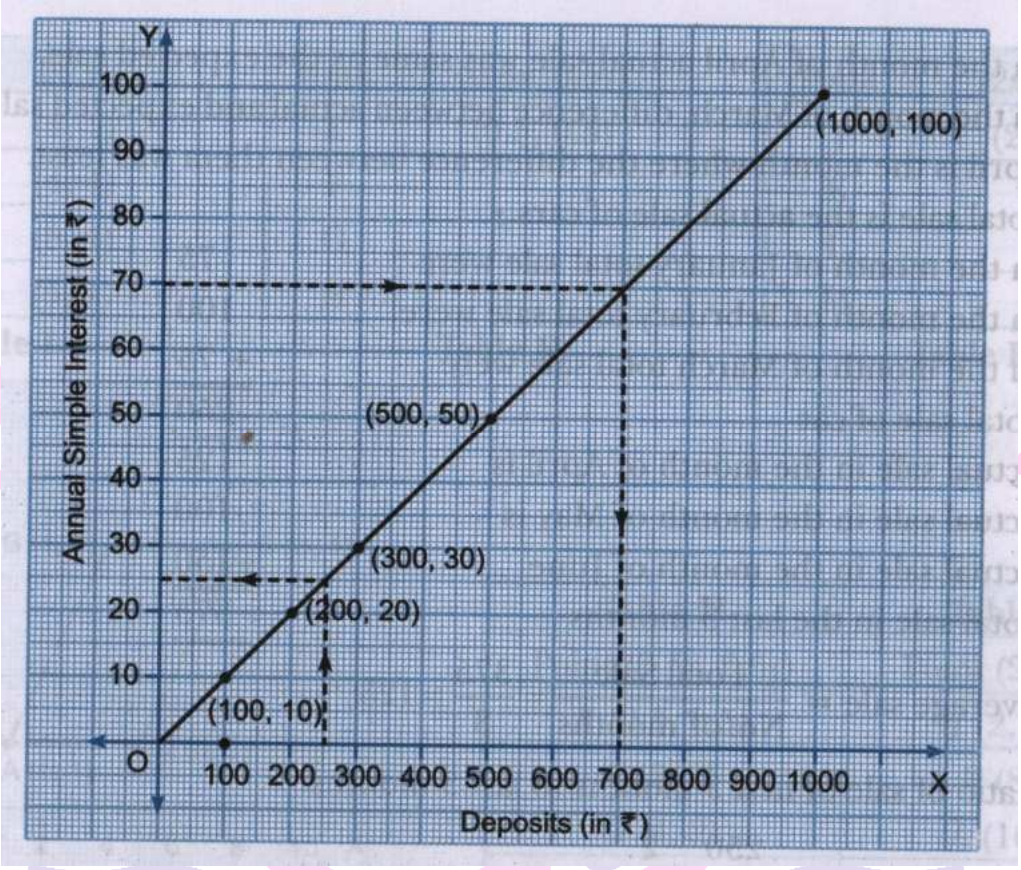


(v) Join the points. We get a graph that is a line

(a) Corresponding to Rs.250 on horizontal axis, we get the interest to be Rs.25 on vertical axis.

(b) Corresponding to Rs.70 on the vertical axis, we get the sum to be Rs.700 on the horizontal axis.

2. The graph given below gives the actual and expected sale of cars of a company for 6 months. study the graph and answer the questions that follow.



i) In which month was the actual sale same as the expected sale?

ii) For which months were the difference in actual and expected sale the maximum?

iii) For which months were the difference in actual and expected sale the least?

iv) What was the total sale of cars in the months –Jan., Feb and March?

v) What was the average sale of cars in the last three months?

vi) Find the ratio of sale in the first three months to the last three months.

Solution:

(i) In the month of April actual sale was same as the expected sale.

(ii) In the month of March, difference between actual and expected sale was maximum.

(iii) April is the month where the difference between them was least.

(iv) Total sale is the actual sale of cars.

$75 + 100 + 75 = 250$

(v) Total sale in the last 3 months: $125 + 100 + 150 = 375$

Average sale$= \frac{Total\ sale}{No.of\ months} = \frac{375}{3} = 125$

(vi) Ratio of sale of first 3 months to last 3 months.

$= \frac{250}{375} = \frac{2}{3}$

3. (i) Locate the points A(1,2) ,B(4,2) and (1,4) on a graph sheet taking suitable axes. Write the coordinates of the fourth point D to complete the rectangle ABCD.

(ii) Locate the points A(1,2) .B(3,4) and C(5,2) on a graph sheet taking suitable axes .Write the coordinates of the fourth point D to complete the rhombus ABCD. Measure the diagonals of this rhombus and find whether they are equal or not

Solution:

(i) A (1,2) B (4,2) C(1,4) fourth point D (4,4)

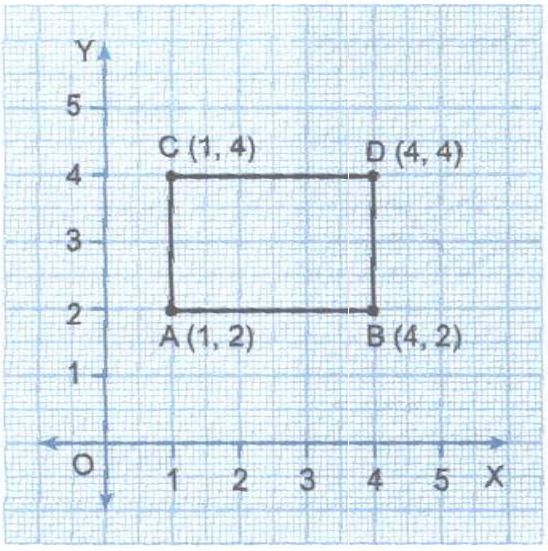
(ii) Co- ordinates of D are (3,0)

Length of diagonal BD = 4-0= 4 units.

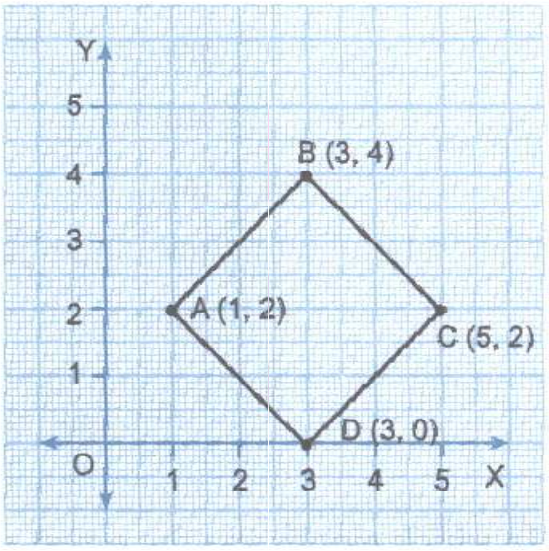
Length of diagonal AC=5-1=4 units.

In this rhombus the diagonals are of equal length

(i)



(ii)



4. Draw a parallelogram ABCD on a graph paper with the coordinates given in Table I. Use this table to complete Tables II and III to get the coordinates of E, F, G, H and J, K, L, M.

Point	(x, y)
A	(1, 1)
B	(4, 4)
C	(8, 4)
D	(5, 1)

Table I

Point	(0.5x, 0.5y)
E	(0.5, 0.5)
F	
G	
H	

Table II

Point	(2x, 1.5y)
J	(2, 1.5)
K	
L	
M	

Table III

Sol.

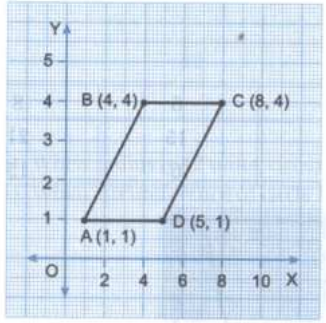


Table II	Table III
Point (0.5x, 0.5y)	Point (2x, 1.5y)
E (0.5, 0.5)	J (2, 1.5)
F (2, 2)	K (8, 6)
G (4, 2)	L (16, 6)
H (2.5, 0.5)	M (10, 1.5)

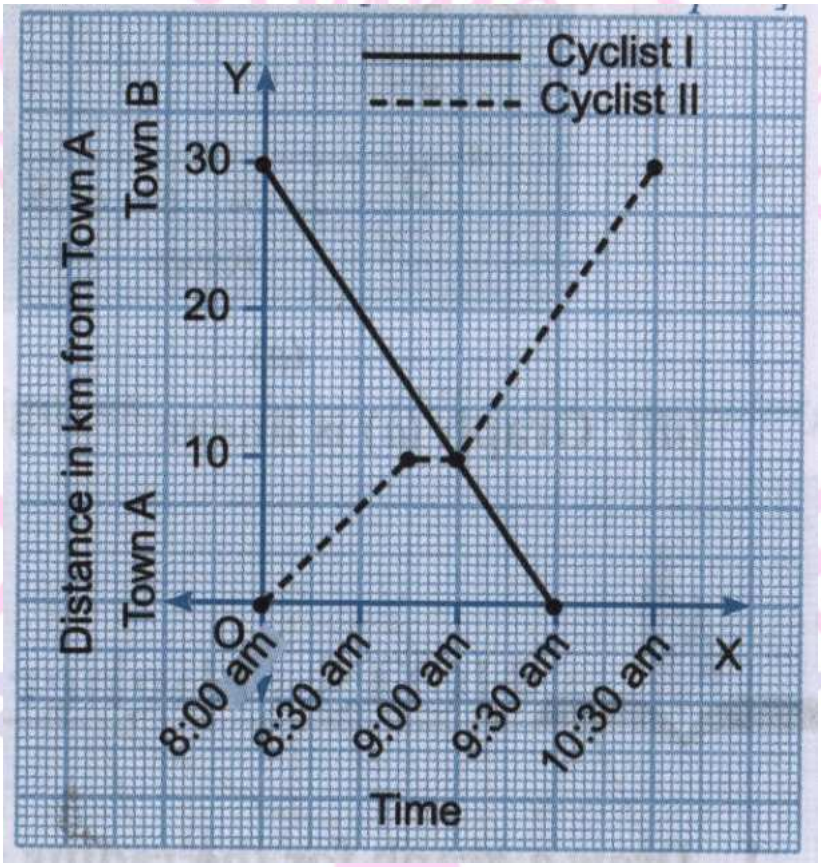
5. The following graph shows the journey made by two cyclists, one from town a to B and the other from town B to A.

(i) at what time did cyclist II rest ? how long did the cyclist rest?

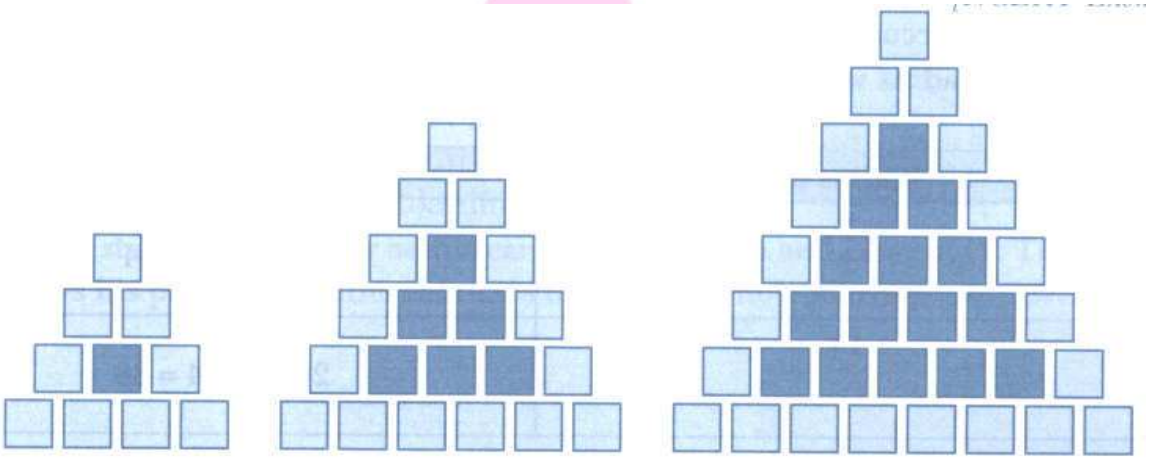
(ii) Was cyclist II cycling faster or slower after the rest ?

(iii) At what time did the two cyclist meet?

(iv) Cyclist II travelled 10 km when he met cyclist I.



6. Sonal and Anmol made sequence of the designs. Three of the designs are shown below.



(i) Complete the table Rows

Rows r	4	6	8
Number of white Tiles (w)	9		
Number of Purple Tiles (p)	1		

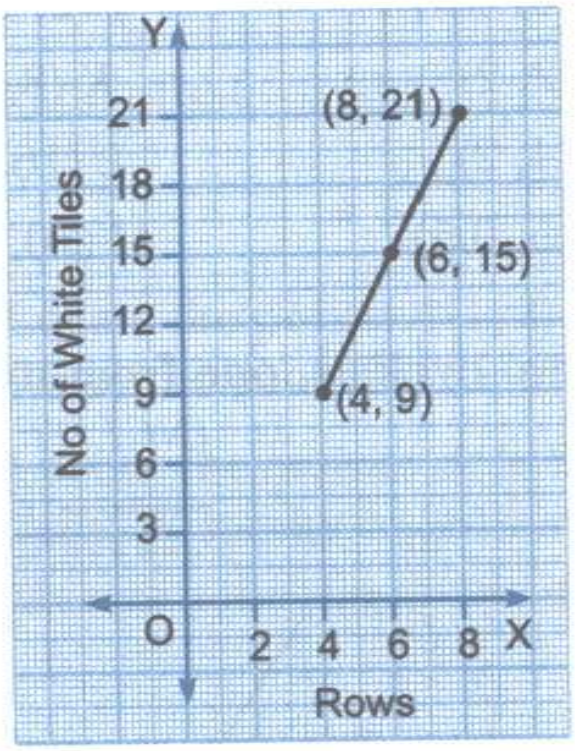
(ii) Draw a graph of rows and number of white tiles. Draw another graph of the number of rows and the number of purple tiles. Put the number of rows on the horizontal axis.

(iii) Which graph is linear?

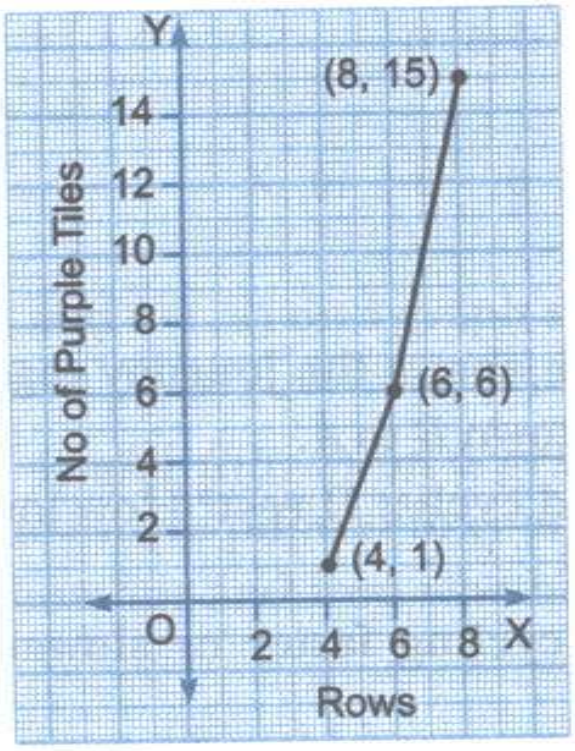
Sol. (i)

Rows r	4	6	8
Number of white Tiles (w)	9	15	21
Number of Purple Tiles (p)	1	6	15

ii.



(a)



(b)

(iii) Graph (a) is linear.

I. High Order Thinking Skills (HOTS) questions.

1. Draw the graph of the function $y = x^2$.

Sol. Since $y = x^2$ ...(i)

Putting $x = 0, 1, 2, 3$ in equation (i)

At $x = 0$, then

Or $y = 0^2 = 0$

At $x = 1$, then

$y = (1)^2 = 1$

At $x = 2$, then

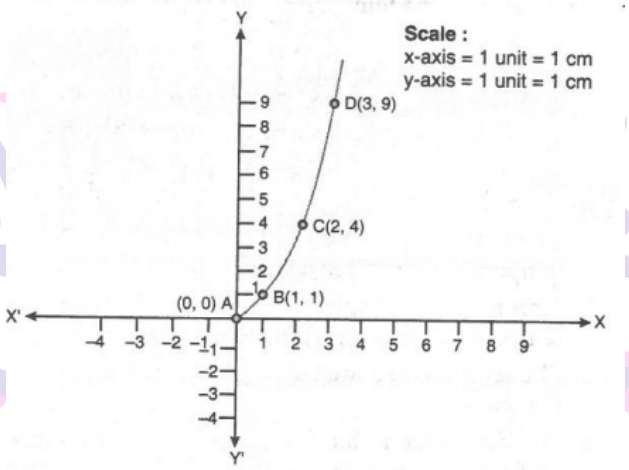
$$y = 2^2 = 4$$

At $x = 3$, then

$$y = 3^2 = 9$$

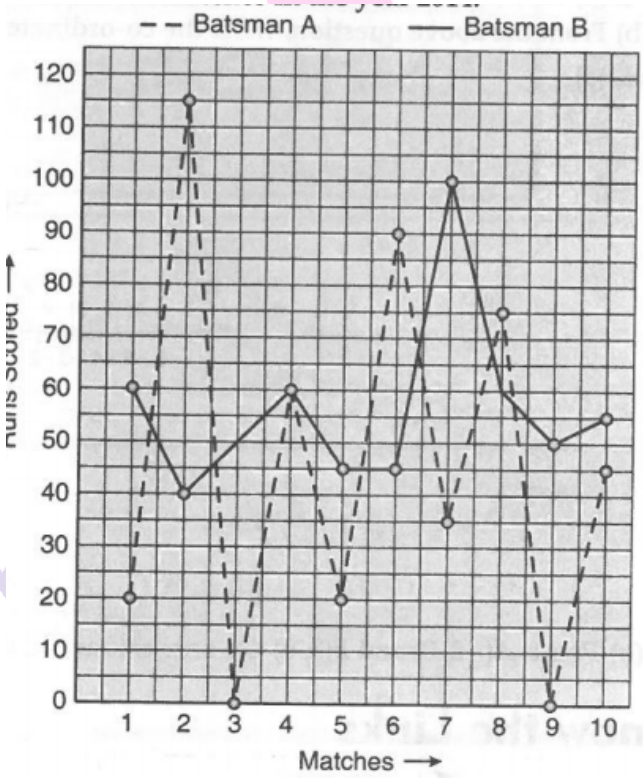
Thus

x	0	1	2	3
y	0	1	4	9



2. **a. Draw the graph of the function $y = 3x + 1$.**

b. The given graph represents the total runs scored by two batsmen A and B, during each of the ten different matches in the year 2014.



Study the graph and answer the following questions.

a. What information is given on the two axes?

b. Which line shows the runs scored by batsman A?

Sol.

a. Let $y = 3x + 1$ (i)

Putting $x = 0, 1, 2,$ in equation (i)

at $x = 0$ *then*

$y = 3 \times 0 + 1 = 1$

at $x = 1$ *then*

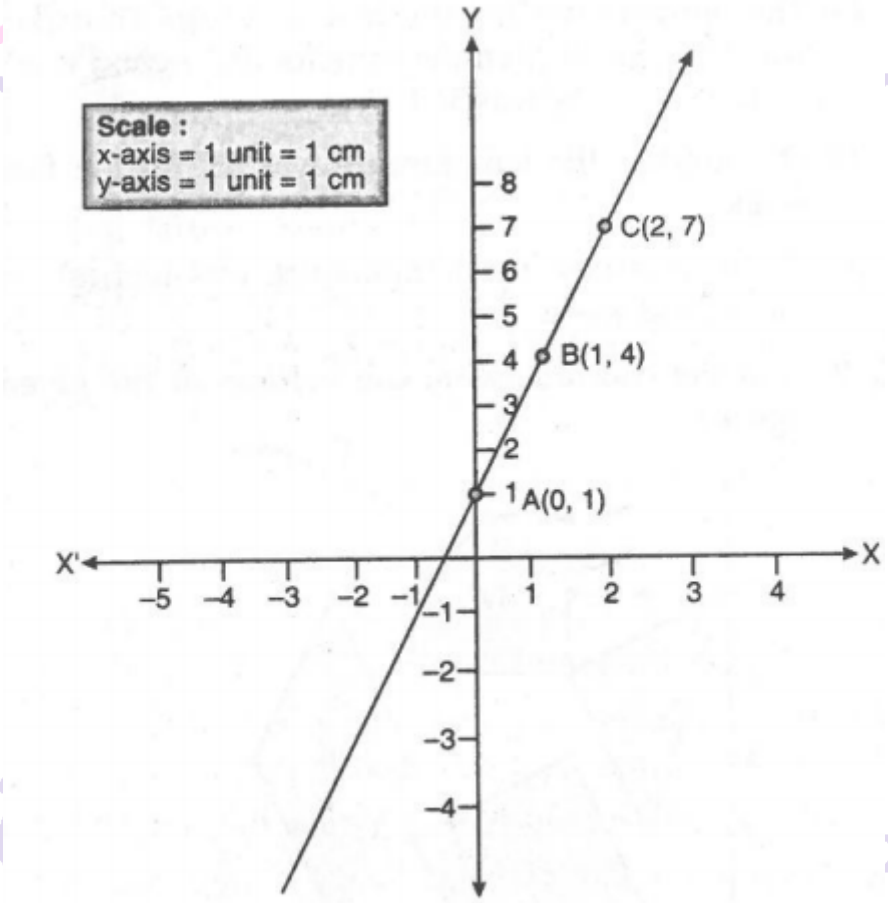
$= 3 \times 1 + 1 = 3 + 1 = 4$

ata $x = 2$ *then*

$y = 3 \times x + 1 = 6 + 1 = 7$

Thus

x	0	1	2
y	1	4	7



b. (i) The horizontal (or the x-axis) indicates the matches played during the year 2014. The vertical axis (or the y – axis) shows the total runs scored in each match.

(ii) The dotted line shows the runs scored by Batsman A. (This is already indicated at the top o the graph).

II. High Order Thinking Skills (HOTS) questions.

1. Draw a graph for the radius and circumference of circle using a suitable scale.

(Hint: Take radius 7, 14, 21 units and so on)

From the graph,

(i) Find the circumference of the circle when radius is 42 units.

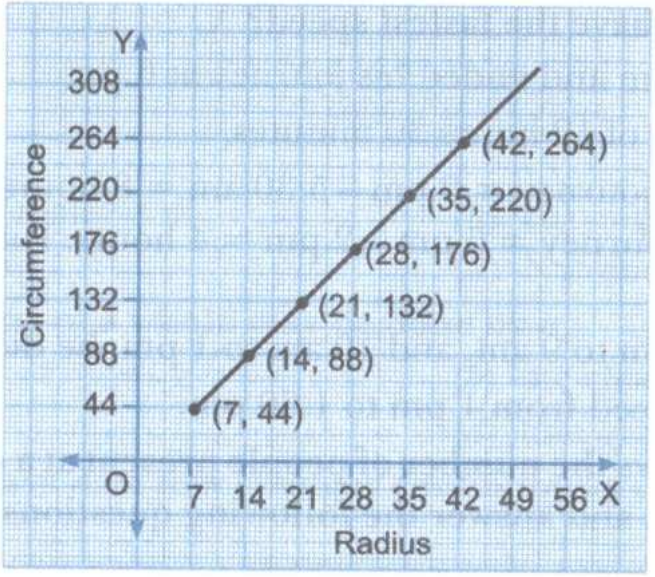
(ii) At what radius will the circumference of the circle be 220 units?

Sol.

Radius (r)	Circumference ($2\pi r$)
7	$2 \times \frac{22}{7} \times 7 = 44$
8	$2 \times \frac{22}{7} 14 = 88$
21	$2 \times \frac{22}{7} \times 21 = 132$
35	$2 \times \frac{22}{7} \times 35 = 220$
42	$2 \times \frac{22}{7} \times 42 = 264$

(i) When radius is 42 units, circumference is 264 units

(ii) When circumference if circle is 220 units, radius is 35 units.



2. Find the coordinates of the vertices of the given figures.

Sol. **In figure I**

Coordinate A (2, 3) Coordinate 13 (1, 1)

Coordinate C (3, 0) Coordinate D (4, 2)

In figure II

Coordinate I (0, 5) Coordinate J (2, 4)

Coordinate K (I, 2)

In figure III

Coordinate 5 (5, 5) Coordinate F (4, 3)

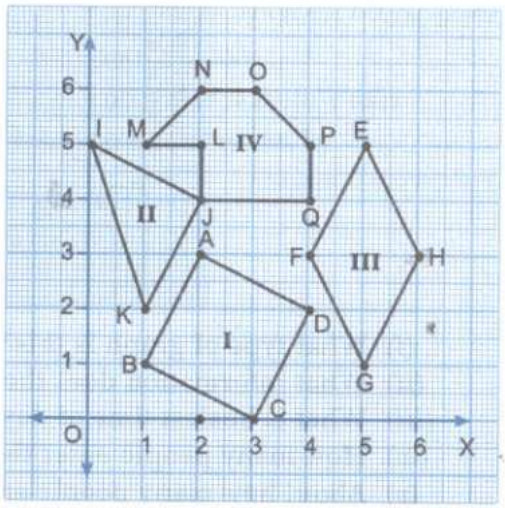
Coordinate G (5, 1) Coordinate H (6. 3)

In figure IV

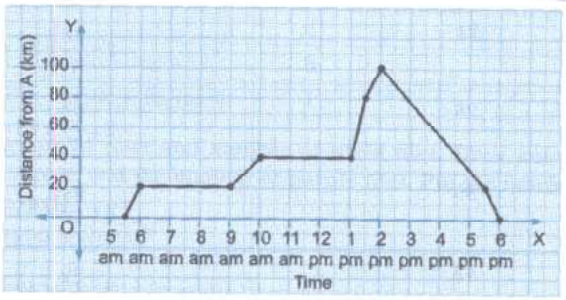
Coordinate 1. (2, 5) Coordinate M (I, 5)

Coordinate N (2, 6) Coordinate 0 (3.8)

Coordinate I' (4, 5) Coordinate



3. A man started his journey on his car from location A and came back. The given graph shows his position at different times during the whole journey. **[NCERT Exemplar]**



(i) At what time did he start and end his journey?

(ii) What was the total duration of journey?

(iii) Which journey, forward or return, was of longer duration?

(iv) For how many hours did he not move?

(v) At what time did he have the fastest speed?

Sol. (i) He started at 5 30 am and ended his journey at 6 pm.

(ii) His total journey was of 12 hours 30 minutes.

(iii) Duration of forward journey = 2 pm - 5:30 am = 8 hours 30 minutes.

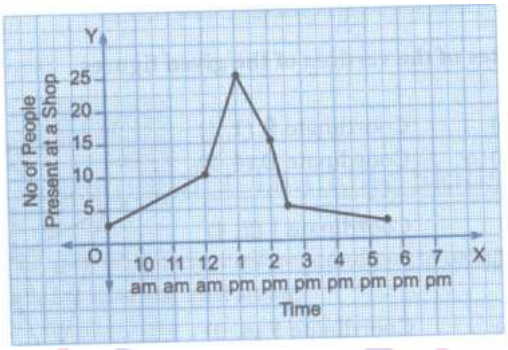
Duration of return journey = 6 pm - 2 pm = 4 hours. Forward journey was of longer duration.

(iv) For 6 hours from 6 am to 9 am, and 10 am to 1 pm, he didn't move.

(vi) He had the fastest speed from 1 pin to 1.30 pm.

4. The following graph shows the number of people present at a certain shop at different times.

Observe the graph and answer the following questions. **[NCERT Exemplar]**



(i) What type of graph is this?

(ii) What information does the graph give?

(iii) What is busiest time of day at the shop?

(iv) How many people enter the shop when it opens?

(v) About how many people are there in the shop at 1 30 pm?

Sol. (i) It is a line graph.

(ii) It represents the number of people visited the shop at different time on a particular day.

(iii) It is 1 pm as 25 people visited the shop which is maximum.

(iv) Less than 5 people entered the shop when it opened.

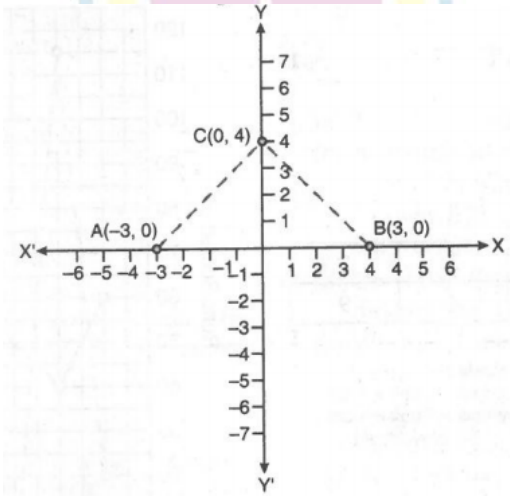
(v) 20 people were there at I : 30 pm.

I. Value based question.

1. **a. Plot the vertices A(-3, 0), B(3, 0) and C(0, 4) of triangle ABC on a graph sheet.**

b. From the above question, write the co-ordinate points that lines on $x-axis$ and $y-axis$?

Sol. (a)



(b) Points A(-3, 0) and B(3, 0) lines on $x-axis$ and C(0, 4) lies on $y-axis$.

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