CHAPTER - 15
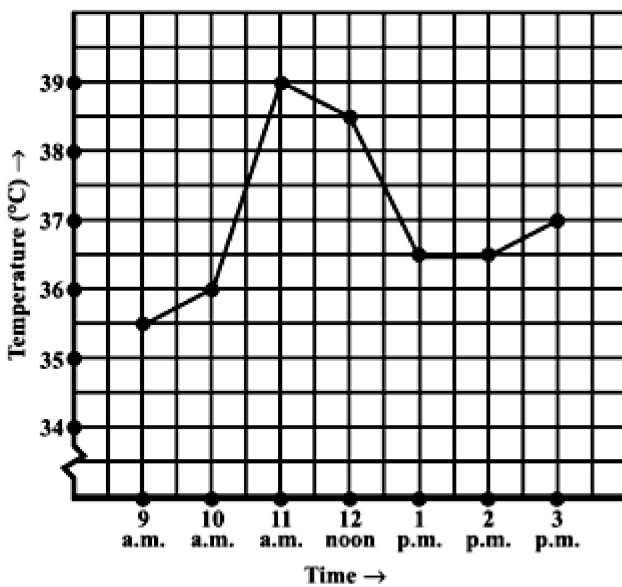
INTRODUCTION TO GRAPHS

EXERCISE 15.1

Question – 1 The following graph shows the temperature of a patient in a hospital, recorded every hour.

A. What was the patient's temperature at 1 p.m.?
B. When was the patient's temperature 38.5° C?

C. The patient's temperature was the same two times during the period given. What were these two times?
D. What was the temperature at 1.30 p.m.? How did you arrive at your answer?
E. During which periods did the patients' temperature show an upward trend?

Answer:

A. The patient's temperature at 1 p.m. was 36.5˚C

B. The patient's temperature 38.5° C12:00 Noon

C. The patient's temperature was same at 1:00 PM and 2:00 PM

D. The graph between the times 1p.m. and 2p.m. is parallel to x-axis. The temperature at 1p.m. and 2p.m. is 36.5⁰c.

Hence, the temperature at 1:30 p.m.is 36.5⁰C.

E. During the following period the patients' temperature showed an upward trend:

From 9:00am to 10:00am, 10:00am to 11:00 AM and from 2:00 to 3:00 PM

Question – 2 The following line graph shows the yearly sales figures for a manufacturing company.

A. What were the sales in (i) 2002 (ii) 2006?
B. What were the sales in (i) 2003 (ii) 2005?
C. Compute the difference between the sales in 2002 and 2006.
D. In which year was there the greatest difference between the sales as compared to its previous year?
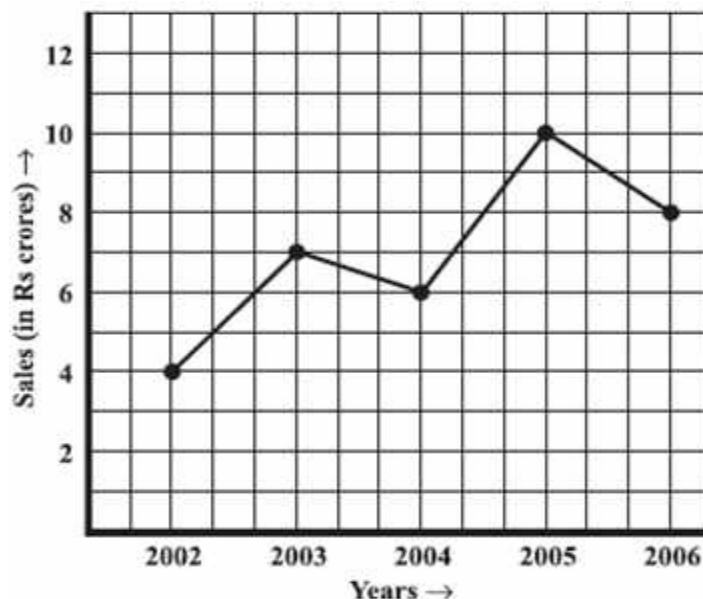
Answer:

A. (i) In 2002, the sales were Rs. 4 crores

 (ii) In 2006, the sales were Rs. 8 crores

B. (i) In 2003, the sales were Rs. 7 Crores

 (ii) Rs. 10 crores

C. (8-4) Crores=4crores;

Sales of 2006 is Rs. 4 crores more than that of 2002

D. 2005 sees the greatest jump in sales which clear from the steepest angle between these years.

Question – 3 For an experiment in Botany, two different plants, plant A and plant B were grown under similar laboratory conditions. Their heights were measured at the end of each week for 3 weeks. The results are shown by the following graph.
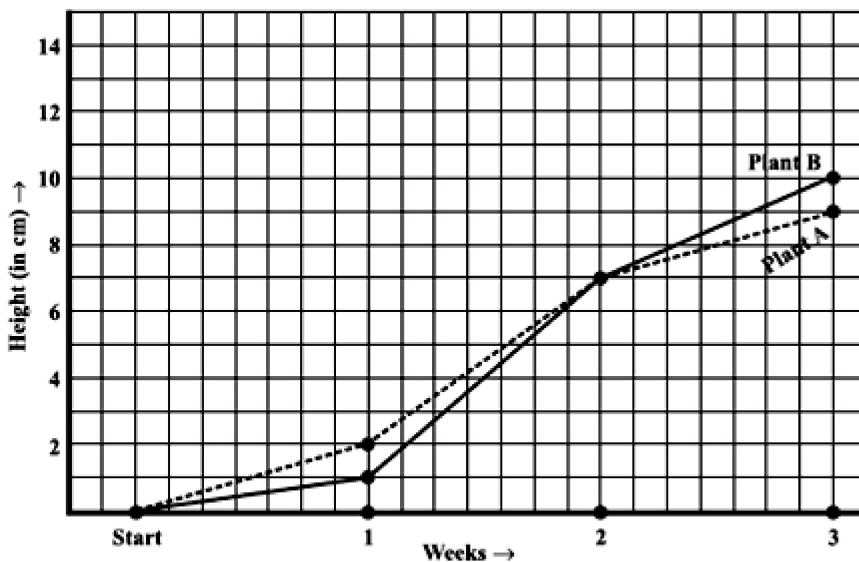
A. How high was Plant A after (i) 2 weeks (ii) 3 weeks?
B. How high was Plant B after (i) 2 weeks (ii) 3 weeks?
C. How much did Plant A grow during the 3rd week?
D. How much did Plant B grow from the end of the 2nd week to the end

of the3rd week?

E. During which week did Plant A grow most?

F. During which week did Plant B grow least?

G. Were the two plants of the same height during any week shown here? Specify.

Answer:

A.

i. After 2 weeks, the height of plant A was 7 cm.

ii. After 3 weeks, the height of plant A was 9 cm.

B.

i. After 2 weeks, the height of plant B was 7 cm.

ii. After 3 weeks, the height of plant B was 10 cm.

C. Growth of plant A during 3rd week

$= 9 - 7$

$= 2$ cm

D. Growth of plant B from the end of 2nd week to the end of 3rd week:

$= 10 - 7$

$= 3$ cm

E. Growth of plant A during 1st week:

$= 2 - 0$

$= 2$ cm

Growth of plant A during 2nd week:

$= 7 - 2$

$= 5$ cm

Growth of plant A during 3rd week:

= 9 -7

= 2 cm

Hence, a grew the most in its 2nd week i.e. 5 cm.

F. Growth of plant B during 1st week:

= 1 -0

= 1 cm

Growth of plant B during 2nd week:

= 7 -1

= 6 cm

Growth of plant B during 3rd week:

= 10 -7

= 3 cm

Hence, plant B grew the least in 1st week i.e. 1cm

G. The heights of both the plants were same at the end of 2nd week.

Question – 4 The following graph shows the temperature forecast and the actual temperature for each day of a week.
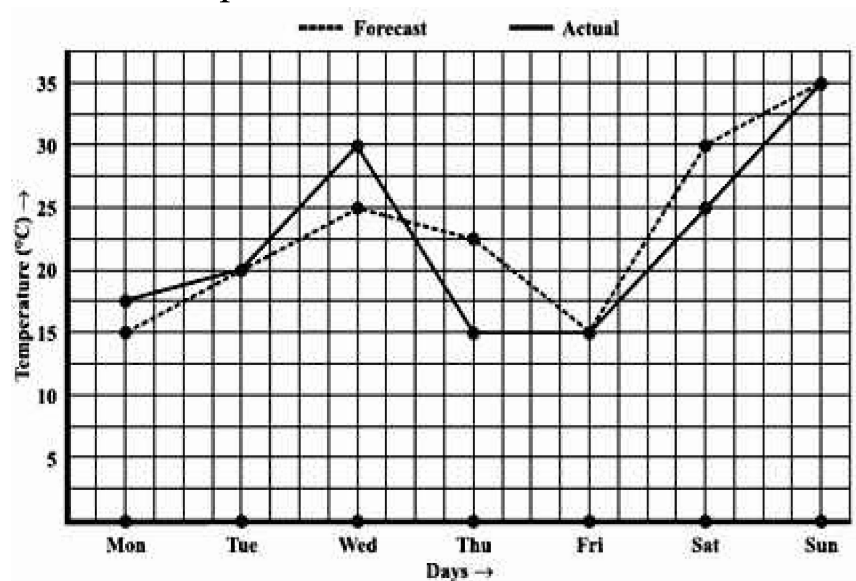
A. On which days was the forecast temperature the same as the actual temperature?

B. What was the maximum forecast temperature during the week?

C. What was the minimum actual temperature during the week?

D. On which day did the actual temperature differ the most from the

forecast temperature?

Answer:

A. The forecast temperature was same as the actual temperature on Tuesday, Friday and Sunday.

B. 35^0C was the maximum forecast temperature during the week.

C. 15^0C was the minimum actual temperature during the week.

D. The actual temperature differs the most from the forecast temperature on Thursday.

Question – 5 Use the tables below to draw linear graphs.
A. The number of days a hill side city received snow in different years.

Years	2003	2004	2005	2006
Days	8	10	5	12

B. Population (in thousands) of men and women in a village in different years.

Years	2003	2004	2005	2006	2007
Number of Men	12	12.5	13	13.2	13.5
Number of Women	11.3	11.9	13	13.6	12.8

Answer:

A. By taking the years on x-axis and the number of days on y-axis, the linear graph of the given information can be represented as:
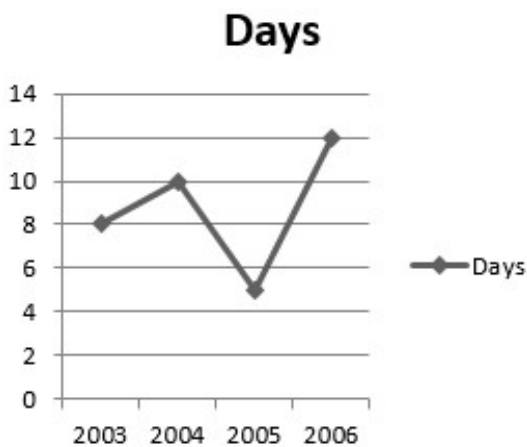

B. By taking the years on x-axis and population on y-axis, the given information can be represented through linear graph as:
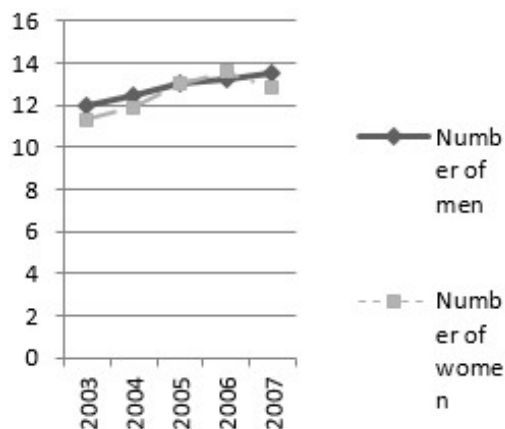
Question – 6 A courier-person cycles from a town to a neighbouring suburban area to deliver a parcel to a merchant. His distance from the

town at different times is shown by the following graph.

A. What is the scale taken for the time axis?
B. How much time did the person take for the travel?
C. How far is the place of the merchant from the town?
D. Did the person stop on his way? Explain.
E. During which period did he ride fastest?
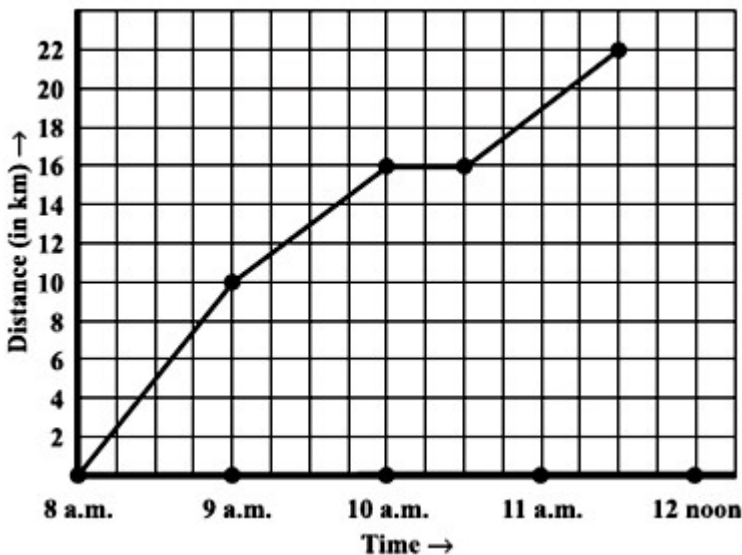
Answer:

A. Kilometer is taken for time axis.

B. 4 hours were taken for travel.

C. Merchant's place is 22km far from the town.

D. Between 10:00 AM to 11:00 AM the line is horizontal, which explains that the person took rest between these timings.

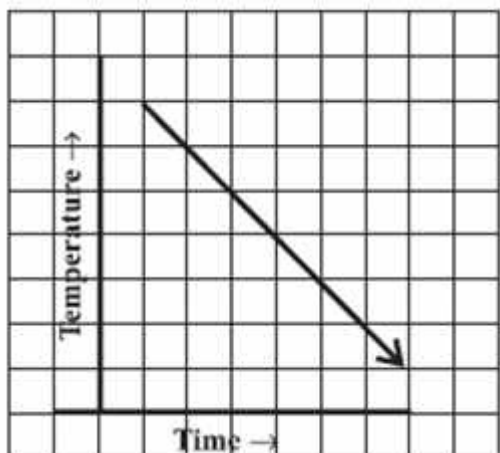E. Between 8:00 AM and 9:00 AM he traveled 10 kms, (look for the steepest angle made by the line)

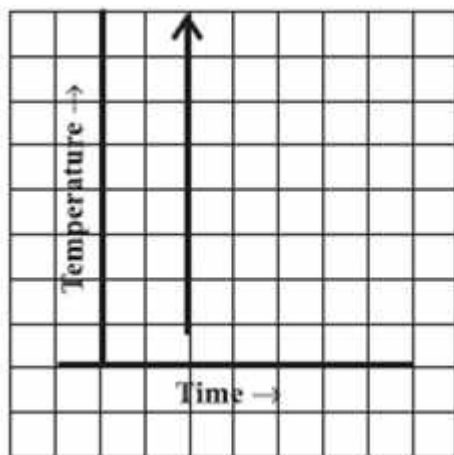**Question – 7** Can there be a time-temperature graph as follows? Justify your answer.
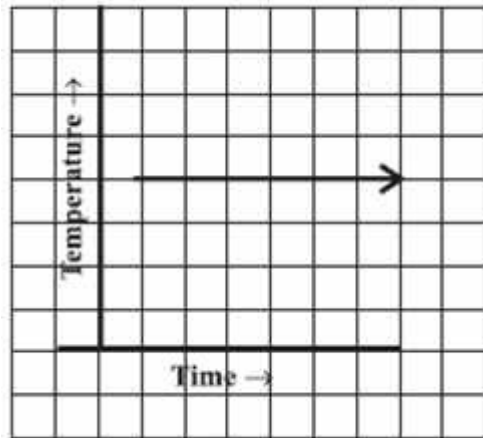
(i)
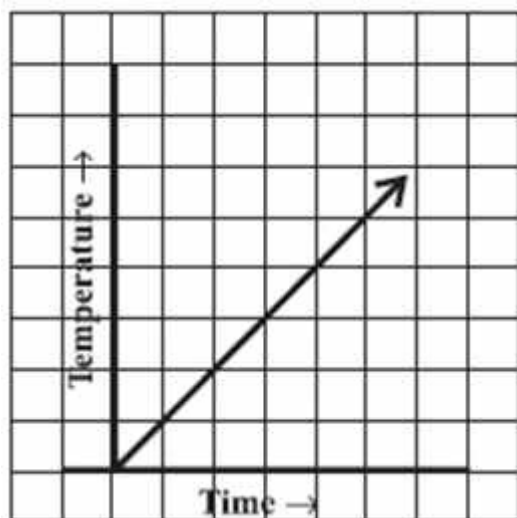
(ii)

(iii)

(iv)

Answer:

i. This can be a time-temperature graph, because the temperature can increase with increase in time.

ii. It can be a time-temperature graph, since the temperature can decrease with the decrease in time.

iii. It can't be a time- temperature graph because the graph shows different temperature on the same time which is not possible.

iv. This can be a time-temperature graph, as same temperature at different times is possible.

EXERCISE – 15.2

Question – 1 Plot the following points on a graph sheet. Verify if they lie on a line
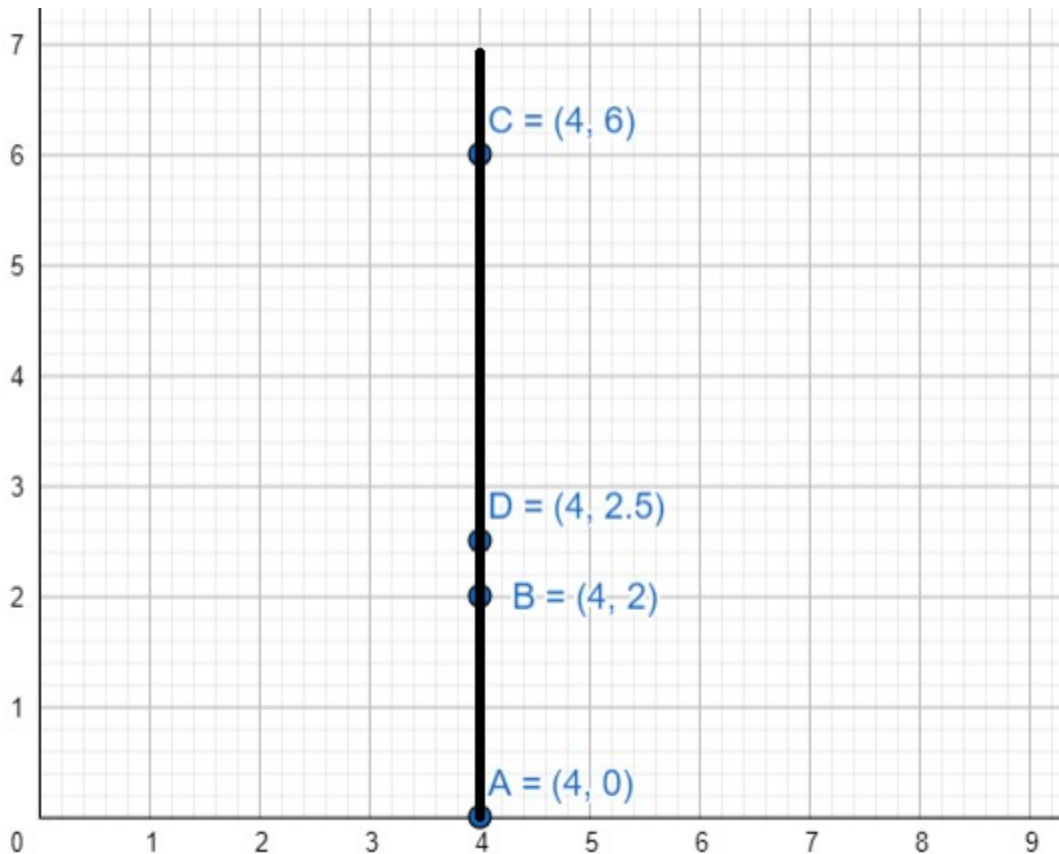
A. A(4, 0), B(4, 2), C(4, 6), D(4, 2.5)

B. P(1, 1), Q(2, 2), R(3, 3), S(4, 4)

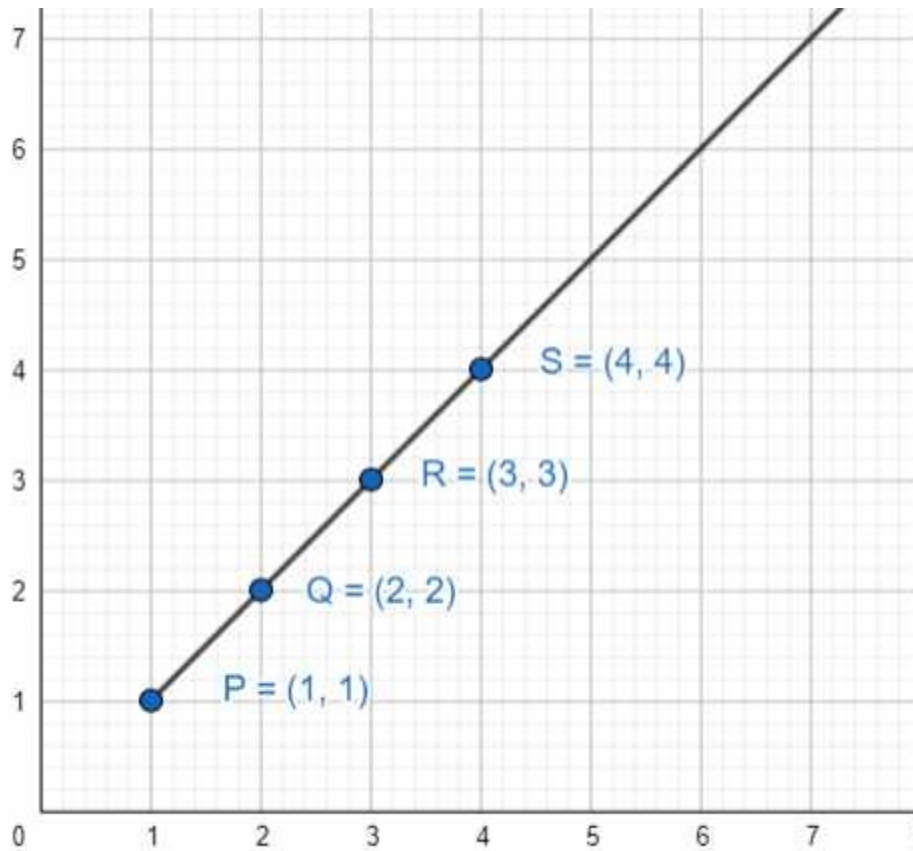C. K(2, 3), L(5, 3), M(5, 5), N(2, 5)

Answer:

a) We can plot the given points and join the consecutive points as follows:
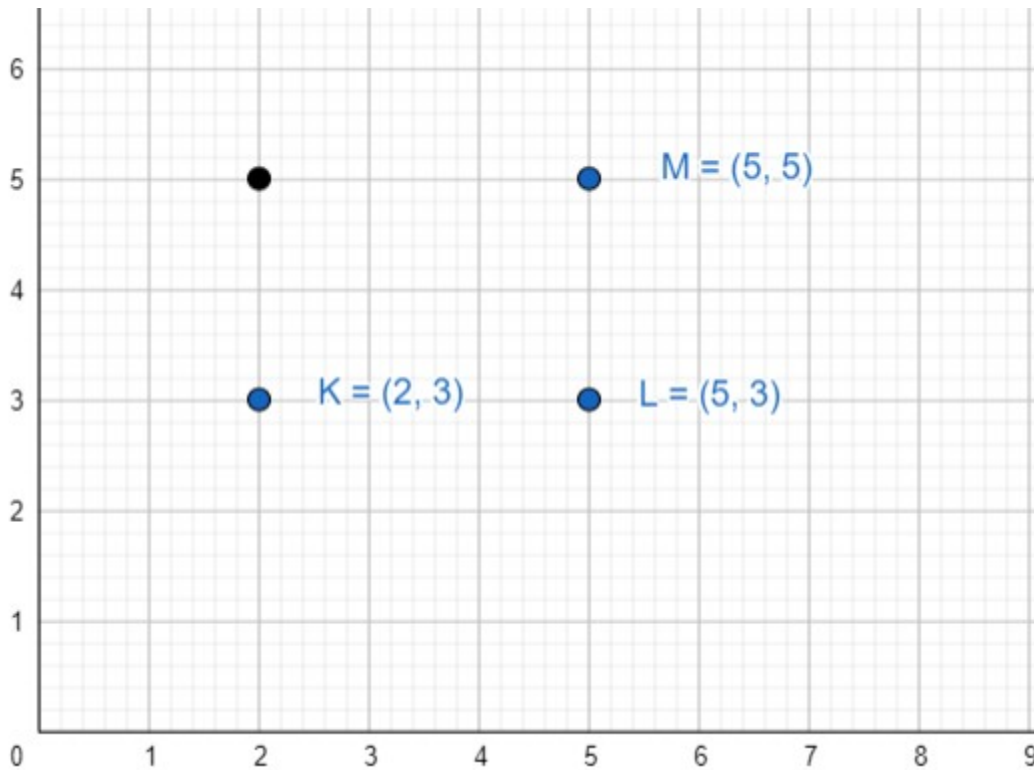
From the graph, we can observe that points A, B, C, and D lie on the same line.

b) We can plot the given points and join the consecutive points as follows:

Therefore, point P, Q, R and S lie on the same line.

c) We can plot the given points and join the consecutive points as follows:
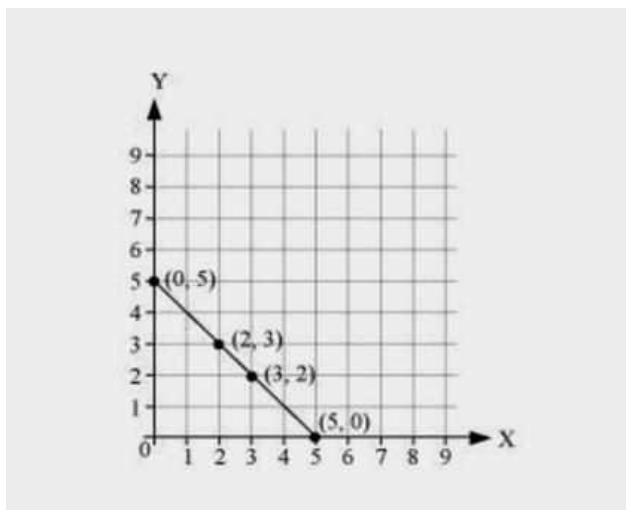
Therefore, points K, L, M and N do not lie on the same line.

Question – 2 Draw the line passing through (2, 3) and (3, 2). Find the coordinates of the points at which this line meets the x-axis and y-axis.
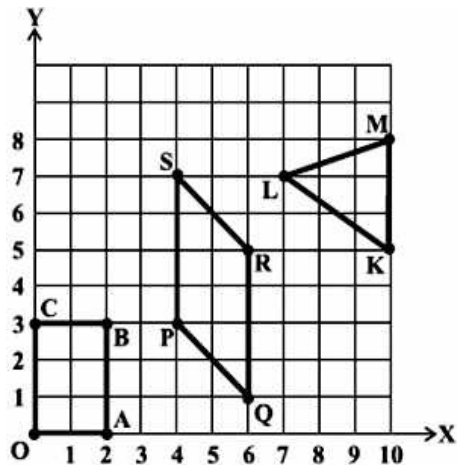
Answer:

From the graph,

We can observe that the line joining the points (2,3) and (3,2) meets the x-axis at the point (5,0) and the y-axis at the point (o,5)

Question – 3 Write the coordinates of the vertices of each of these adjoining figures.

Answer:

The coordinates of the vertices are:

O (0,0); A (2,0); B (2,3); C (0,3)

P (4,3); Q (6,1); R (6,5); S (4,7)

K (10,5), L (7,7); M (10,8)

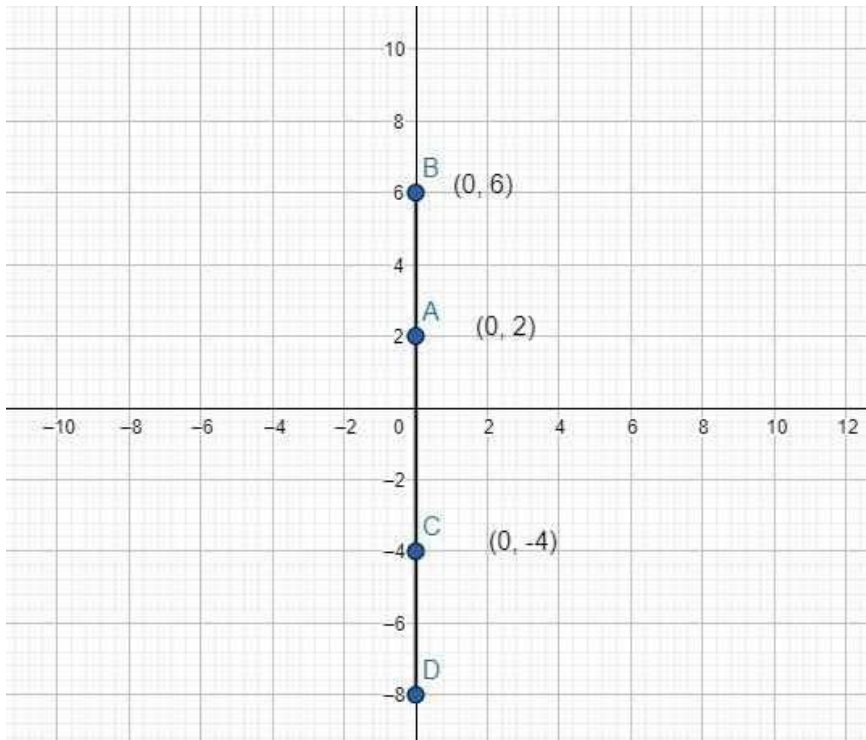**Question – 4** State whether True or False. Correct that are false
(i) A point whose x coordinate is zero and y-coordinate is non-zero will lie on the y-axis.
(ii) A point whose y coordinate is zero and x-coordinate is 5 will lie on y-axis.
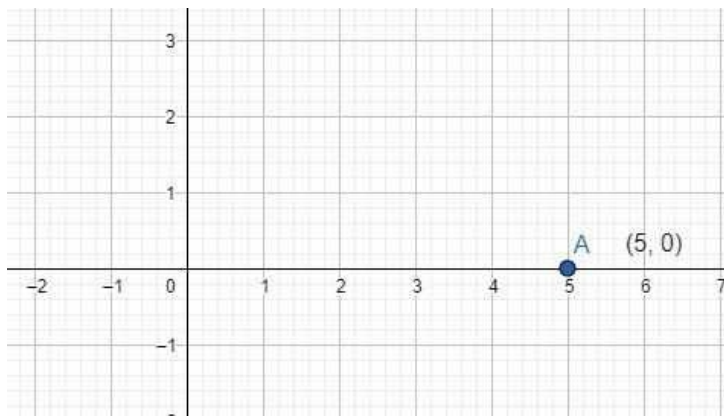(iii) The coordinates of the origin are (0, 0).

Answer:

i. True

From the graph coordinates of all the four points have x - coordinate = 0, And each point lies on y - axis

ii. False

The point with x-coordinate 5 and y-coordinate 0 will lie on x-axis.

iii. True

EXERCISE – 15.3

Question – 1 Draw the graphs for the following tables of values, with suitable scales on the axes.

A. Cost of apples

Number of apples	1	2	3	4	5
Cost (in Rs)	5	10	15	20	25

B. Distance travelled by a car

Time (in hours)	6 a.m.	7 a.m.	8 a.m.	9 a.m.
Distances (in km)	40	80	120	160

(i) How much distance did the car cover during the period 7.30 a.m. to 8 a.m.?

(ii) What was the time when the car had covered a distance of 100 km since its start?

C. Interest on deposits for a year.

Deposit (in Rs)	1000	2000	3000	4000	5000
Simple Interest (in Rs)	80	160	240	320	400

(i) Does the graph pass through the origin?

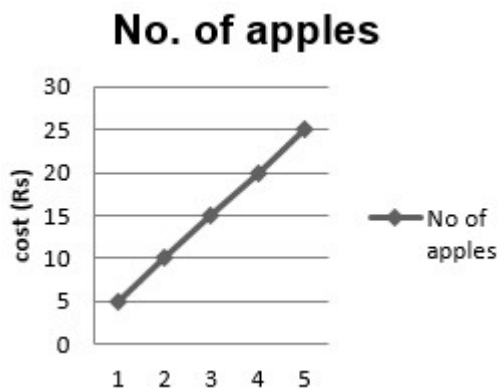(ii) Use the graph to find the interest on Rs 2500 for a year.

(iii) To get an interest of Rs 280 per year, how much money should be deposited?

Answer:

(a) We will mark the number of apples on x-axis and cost of apples on y-axis.

The graph of the given data:

No. of apples

cost (Rs)

30
25
20
15
10
5
0

1 2 3 4 5

◆ No of apples

(b) We will represent time on x-axis and the distance travelled on y axis. The graph of the given data is:

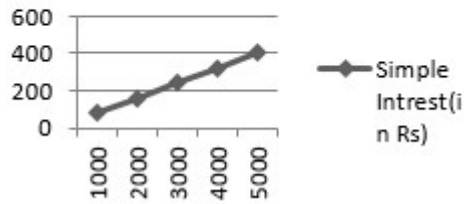## Distance

200
150
100
50
0

6am 7am 8am 9am
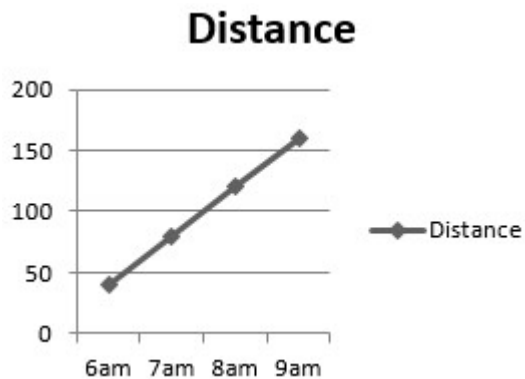
◆ Distance

i. During the 7:30am-8am period, the car covered 20km

ii. The car covered a distance of 100km at 7:30am since its start.

(c) We can represent the deposit on x-axis and the interest earned on y-axis.

Hence, the required graph is:

Simple Intrest(in Rs)

I. No, the graph passes through the origin

II. The mid-point between 2000 and 3000 is near Rs.200. Hence, the interest for Rs. 2500 is Rs.200.

III. To get an interest of Rs 280 per year, 3500 money should be deposited

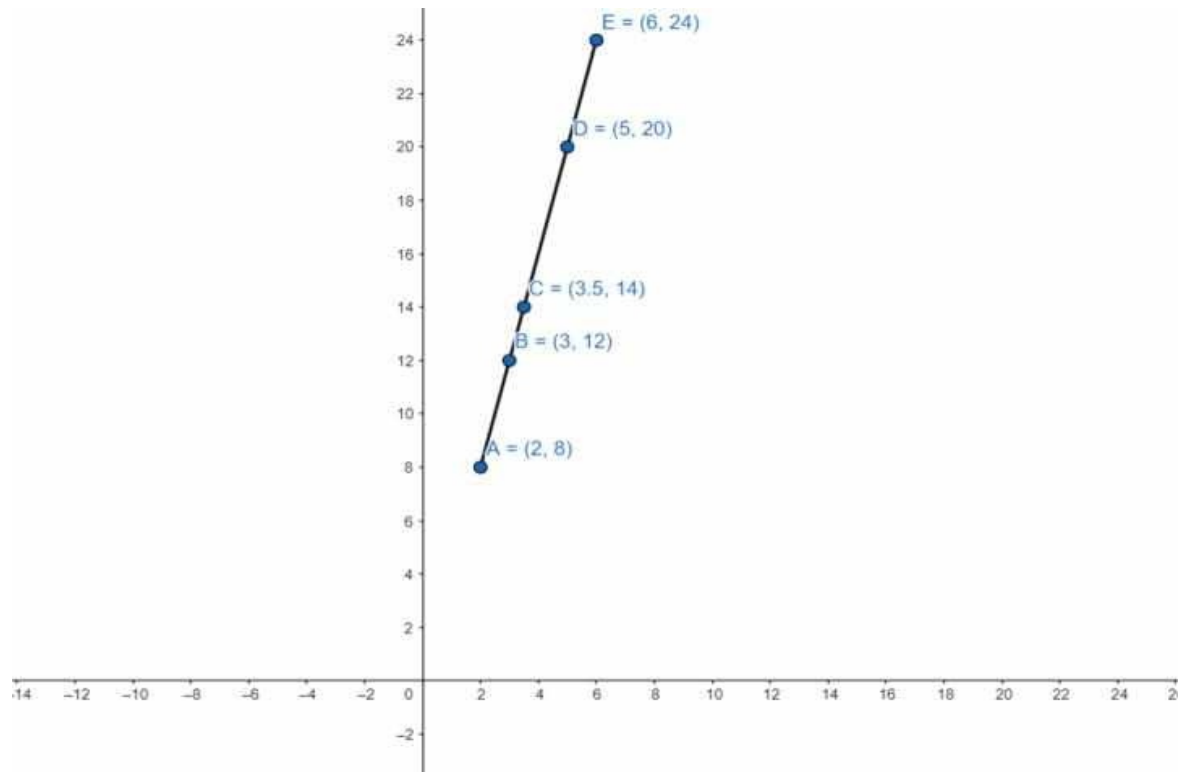**Question – 2** Draw a graph for the following.
(i) Is it a linear graph?

Side of square (in cm)	2	3	3.5	5	6
Perimeter (in cm)	8	12	14	20	24

(ii) Is it a linear graph?

Side of square (in cm)	2	3	3.5	5	6
Area (in cm²)	4	9	16	25	36

Answer: i. The given data can be represented in the form of graph as:

Yes, it is a linear graph.

ii. The given data can be represented in the form of graph as:
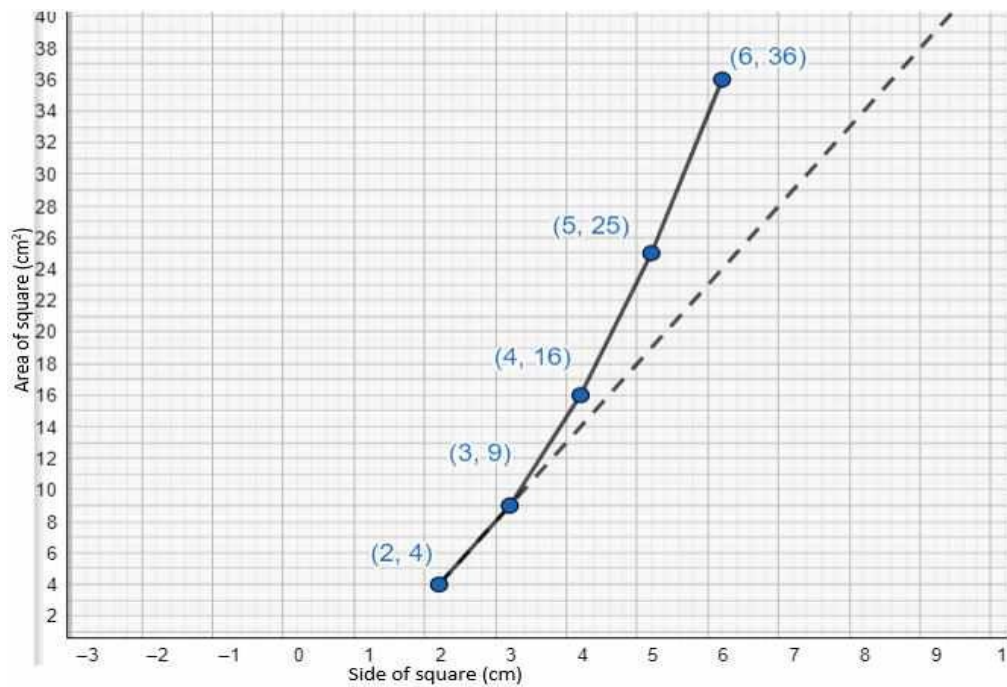
No, it is not a linear graph.