

INTRODUCTION TO GRAPH

Exercise 15.1

1

The following graph shows temperature of a patient in a hospital, recorded every hour.

(a) What was the patient's temperature at 1 p.m. ?

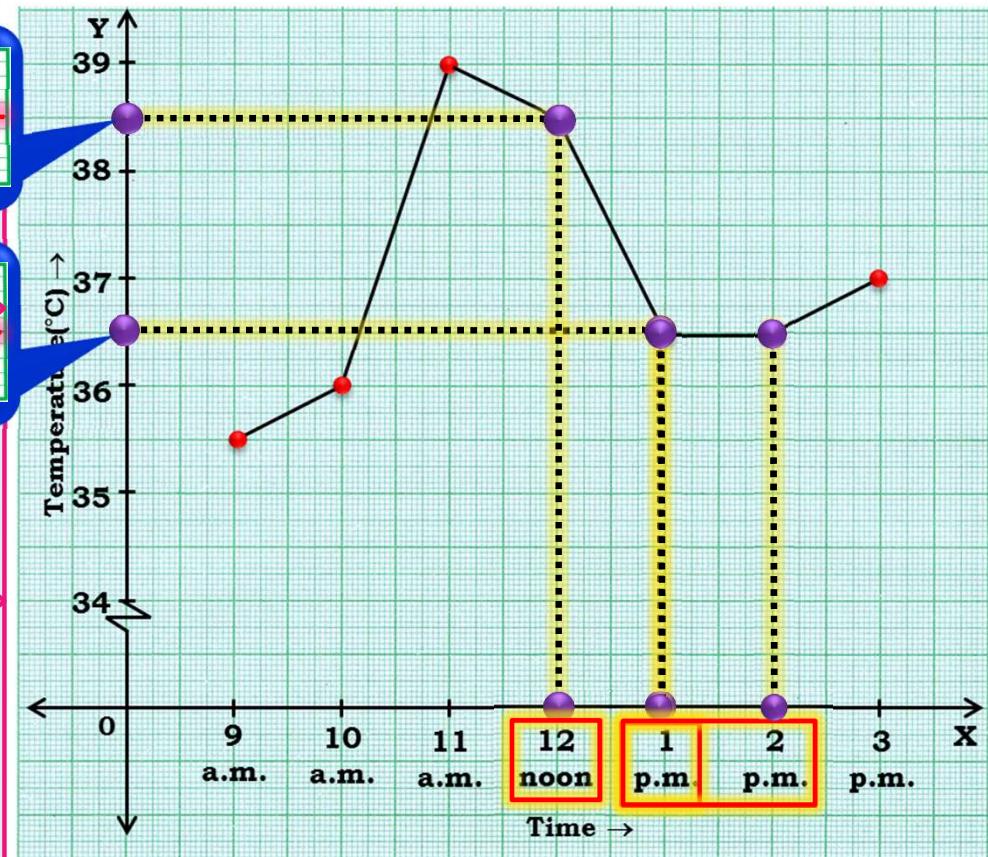
Sol : The patient's temperature was 36.5°C at 1 p.m.

(b) When was the patient's temperature 38.5°C ?

Sol : The patient's temperature was 38.5°C at 12 noon.

(c) The patient's temperature was the same two times during the period given. What were these two times ?

Sol : The patient's temperature was the same two times between 1 p.m to 2 p.m.



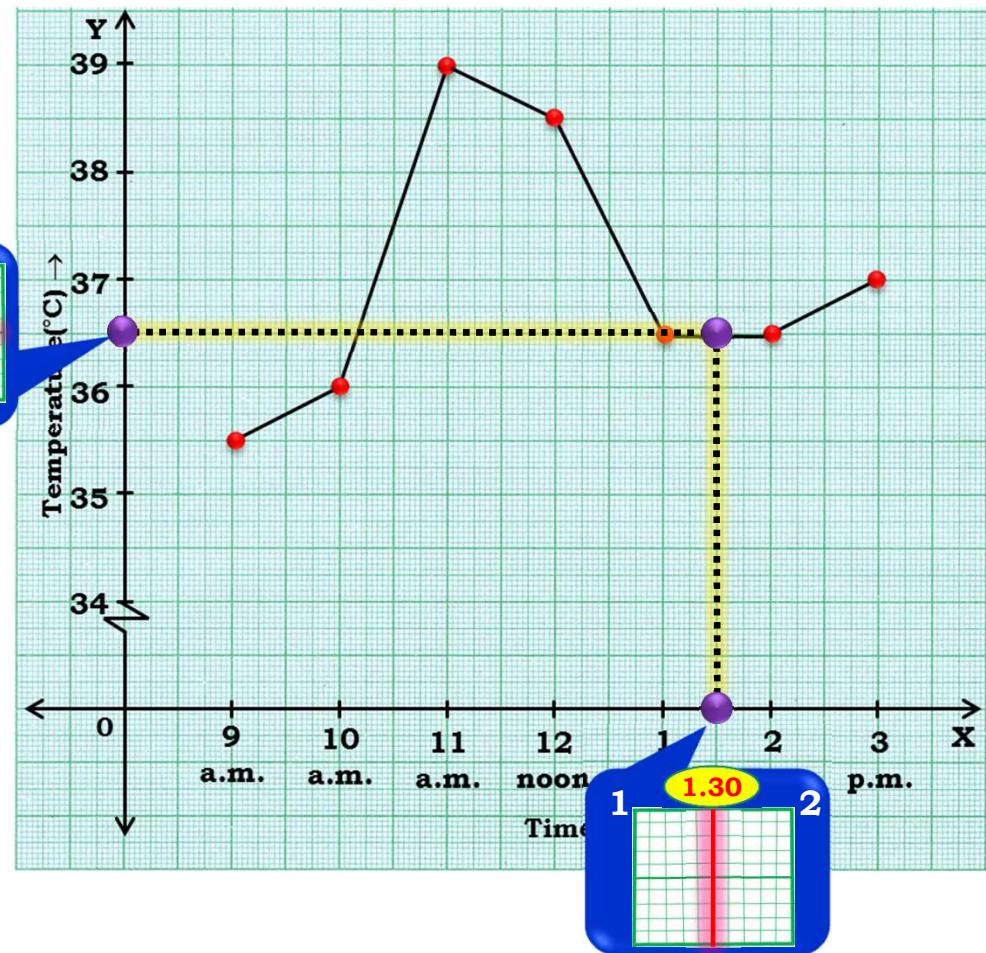
1

The following graph shows temperature of a patient in a hospital, recorded every hour.

(d) What was the temperature at 1.30 p.m.? How did you arrive at your answer?

Sol : The temperature at 1.30 p.m. is 36.5°C .

The point between 1 p.m. and 2 p.m., x -axis is equidistant from the two points showing 1 p.m. and 2 p.m. So it represents 1.30 p.m. Similarly the point on y -axis, between 36°C and 37°C will represent 36.5°C .

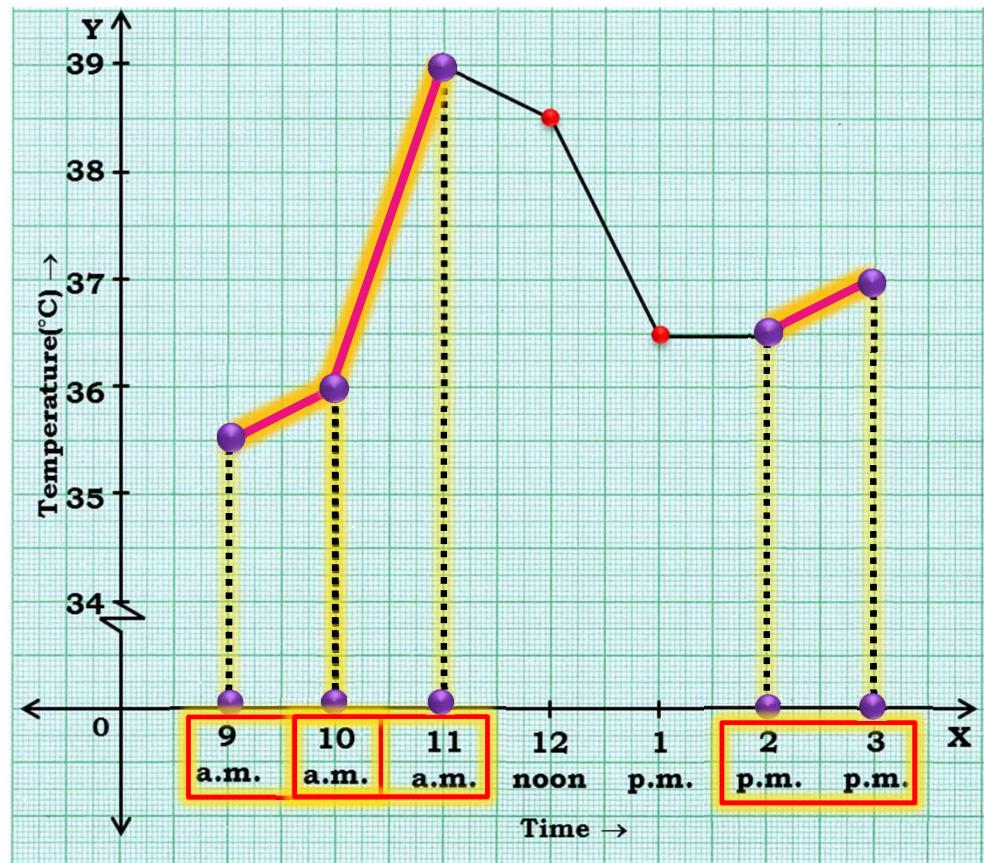


1

The following graph shows temperature of a patient in a hospital, recorded every hour.

(e) During which periods did the patients' temperature showed an upward trend ?

Sol : The temperature of patient showed an upward trend during **9 a.m. to 10 a.m.**
10 a.m. to 11 a.m.
2 p.m. to 3 p.m.



2

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

(a) What were the sales in (i) 2002 (ii) 2006 ?

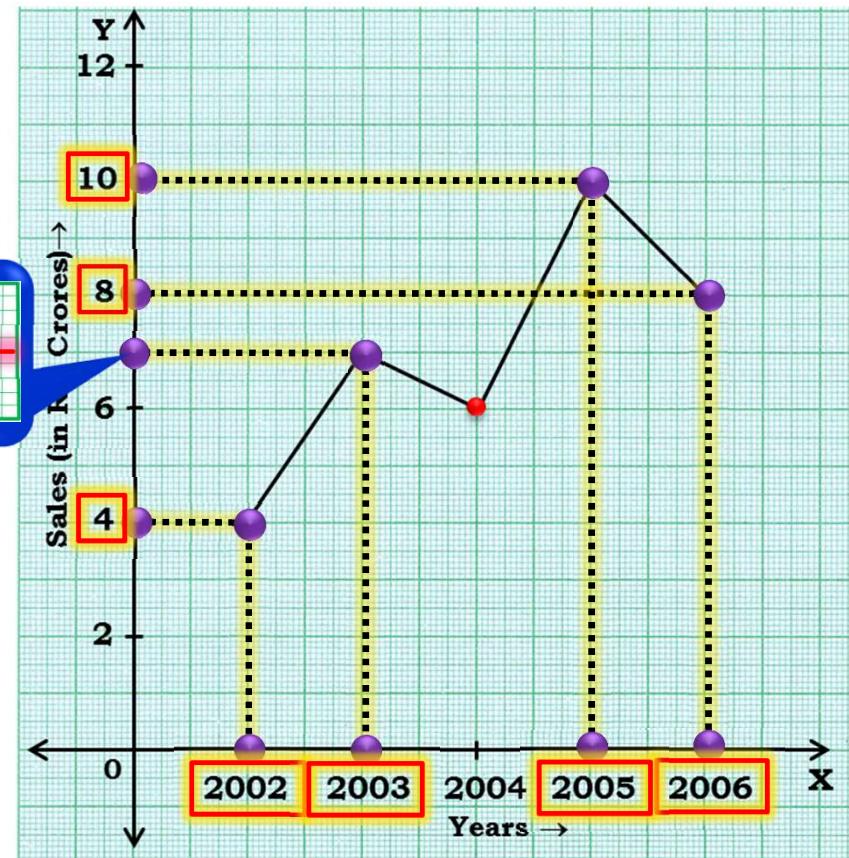
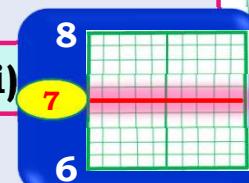
Sol : The sales in :

- (i) 2002 was Rs. 4 crores.
- (ii) 2002 was Rs. 8 crores.

(b) What were the sales in (i) 2003 (ii) 2005 ?

Sol : The sales in :

- (i) 2003 was Rs. 7 crores.
- (ii) 2005 was Rs. 10 crores.



2

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

- (c) Compute the difference between the sales in 2002 and 2006.

Sol : The difference of sales in 2002 and 2006

$$= \text{Rs. } 8 \text{ crores} - \text{Rs. } 4 \text{ crores}$$

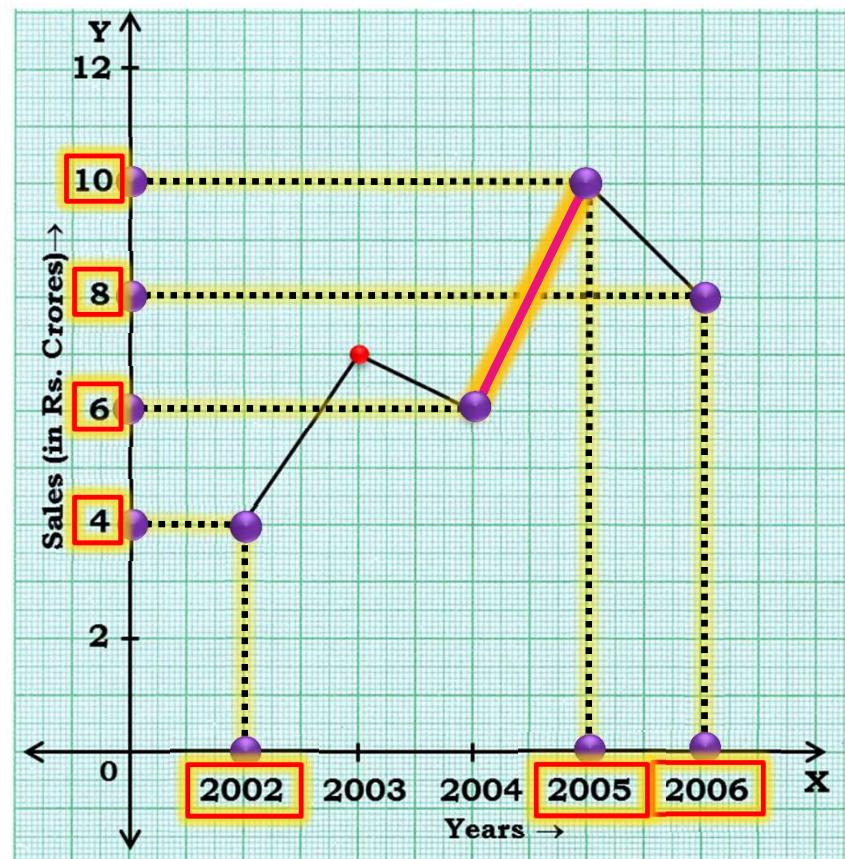
$$= \text{Rs. } 4 \text{ crores}$$

- (d) In which year was there the greatest difference between the sales as compared to its previous year ?

Sol : The difference of sales in 2002 and 2006

$$= \text{Rs. } 10 \text{ crores} - \text{Rs. } 6 \text{ crores}$$

$$= \text{Rs. } 4 \text{ crores}$$



3

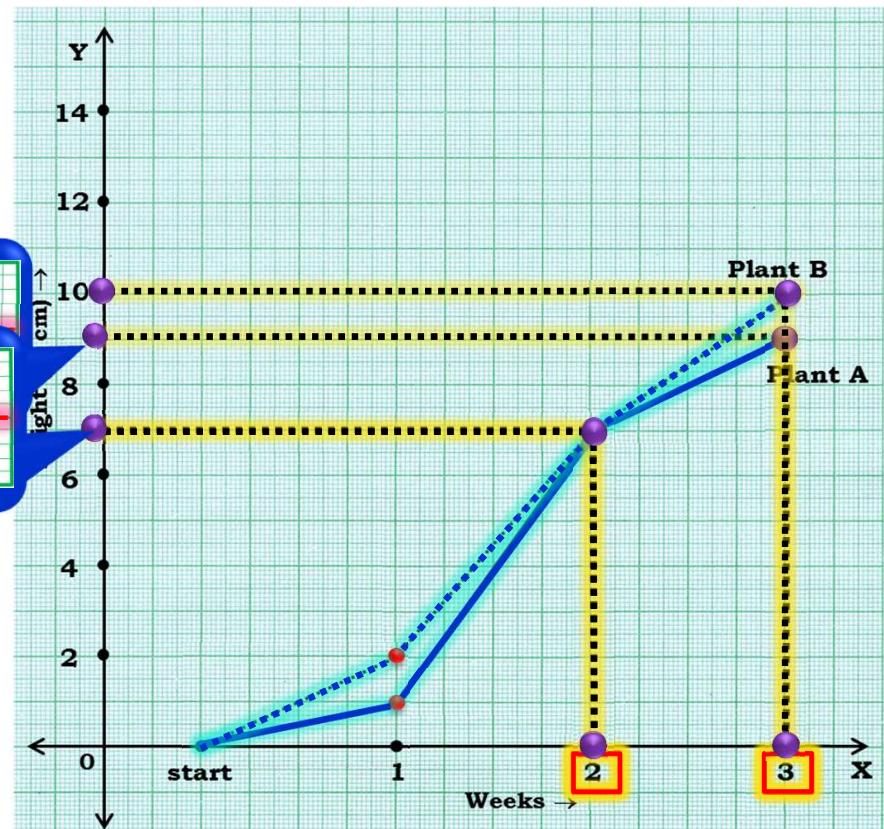
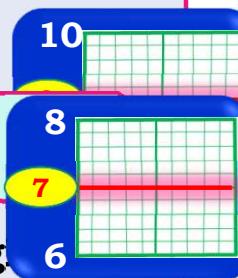
For an experiment in Botany, two different plants, plant A and plant B were grown under similar laboratory conditions. Their height were measured at the end of each week for 3 weeks. The results are shown by the following graph.

- (a) How high was plant A after
(i) 2 weeks (ii) 3 weeks ?

Sol : (i) The plant A was 7 cm high
after 2 weeks and
(ii) After 3 weeks it was 9 cm high.

- (b) How high was plant B after
(i) 2 weeks (ii) 3 weeks ?

Sol : (i) The plant A was 7 cm high
after 2 weeks and
(ii) After 3 weeks it was 10 cm high.



3

For an experiment in Botany, two different plants, plant A and plant B were grown under similar laboratory conditions. Their height were measured at the end of each week for 3 weeks. The results are shown by the following graph.

- (c) How much did plant A grow during the 3rd week ?

Sol : During the 3rd week, the plant A grew

$$= 9 \text{ cm} - 7 \text{ cm}$$

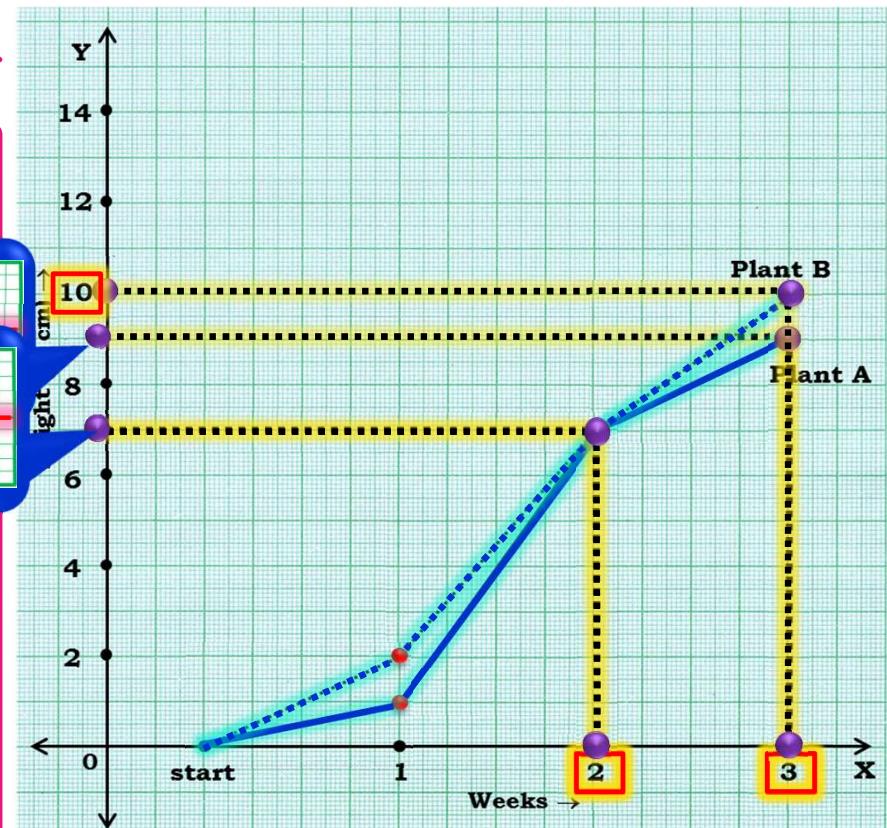
$$= 2 \text{ cm during 3rd week.}$$

- (d) How much did plant B grow from end of the 2nd week to the end of the 3rd week ?

Sol : Plant B grew during end of the 2nd week to the end of the 3rd week

$$= 10 \text{ cm} - 7 \text{ cm}$$

$$= 3 \text{ cm}$$



3

For an experiment in Botany, two different plants, plant A and plant B were grown under similar laboratory conditions. Their height were measured at the end of each week for 3 weeks. The results are shown by the following graph.

(e) During which week did Plant A grow most ?

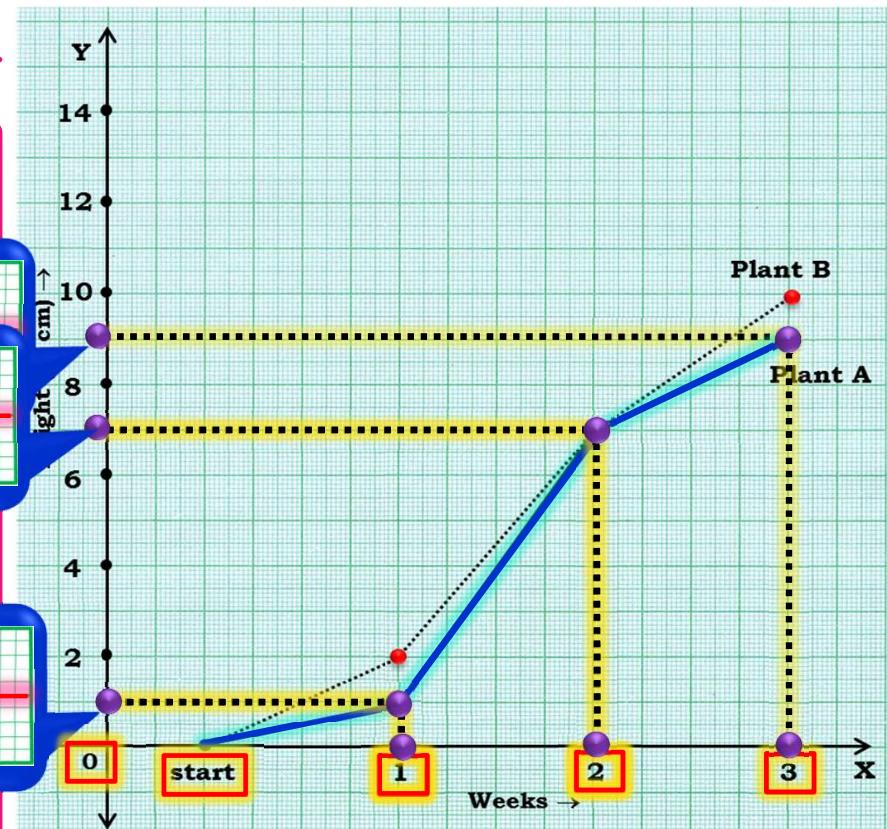
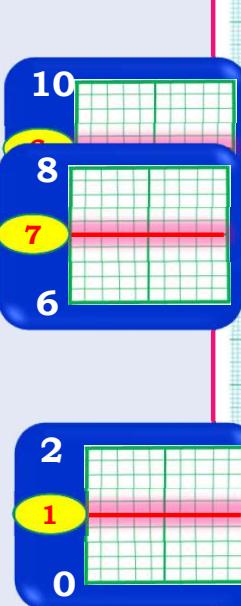
Sol : The growth of the plant A :

During the 1st week : $1 - 0 = 1$

During the 2nd week : $7 - 1 = 6$

During the 3rd week : $9 - 7 = 2$

Thus, during the 2nd week,
the plant A grew the most



3

For an experiment in Botany, two different plants, plant A and plant B were grown under similar laboratory conditions. Their height were measured at the end of each week for 3 weeks. The results are shown by the following graph.

(f) During which week did Plant B grow least ?

Sol : The growth of the plant B :

During the 1st week : $2 - 0 = 2$

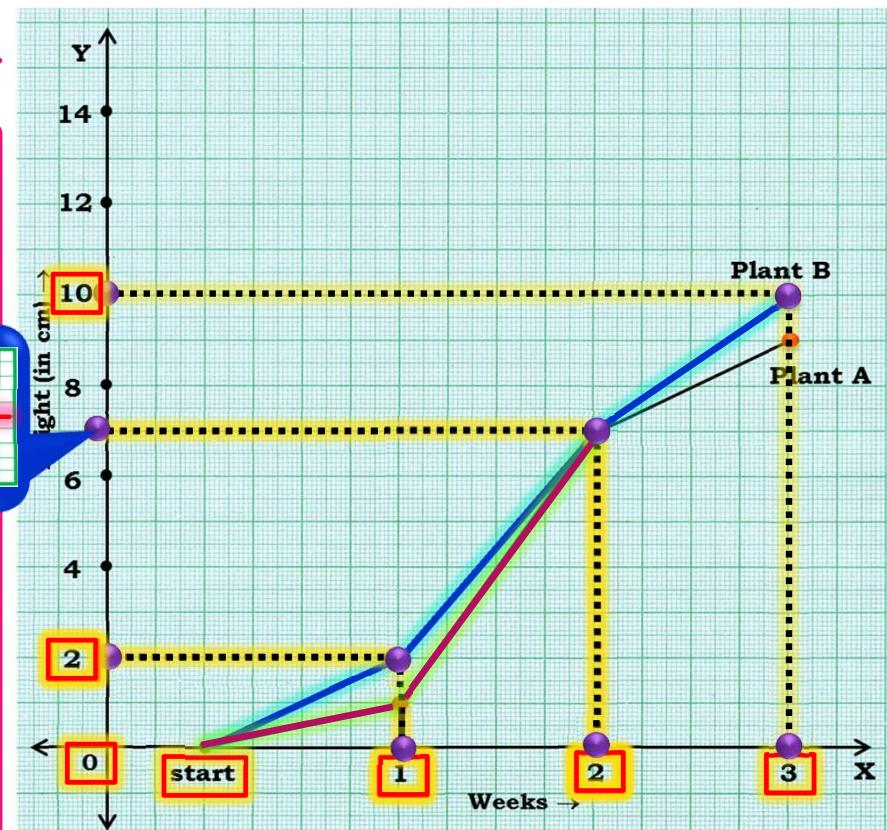
During the 2nd week : $7 - 2 = 5$

During the 3rd week : $10 - 7 = 3$

Thus, during the 1st week,
the plant B grew the least.

(g) Were the two plants of the same height during any week shown here ? Specify.

Sol : At the end of the second week, plant A and B were of the same height.



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 ?

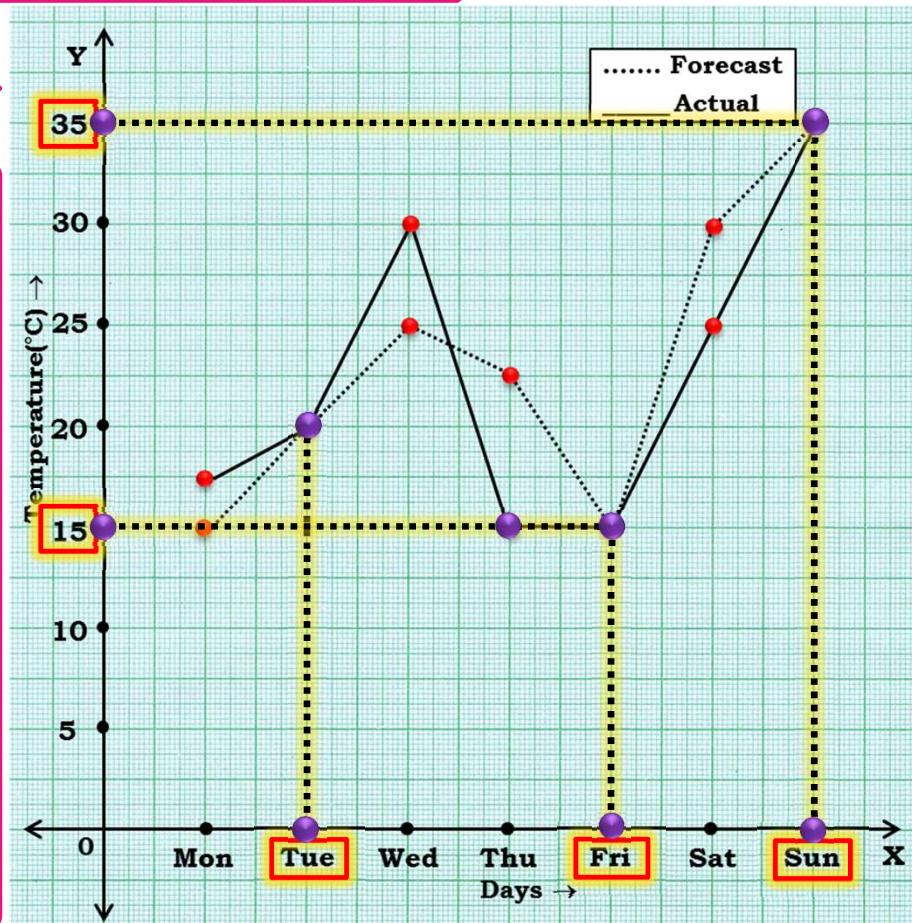
Sol : On Tuesday, Friday and Sunday, The forecast temperature was same as the actual temperature.

- (b) What was the maximum forecast temperature during the week ?

Sol : The maximum forecast temperature was 35°C .

- (c) What was the minimum actual temperature during the week ?

Sol : The minimum actual temperature was 15°C .



4

The following graph shows the temperature forecast and the actual temperature for each day of a week.

- (d) On which day did the actual temperature differ the most from the forecast temperature ?

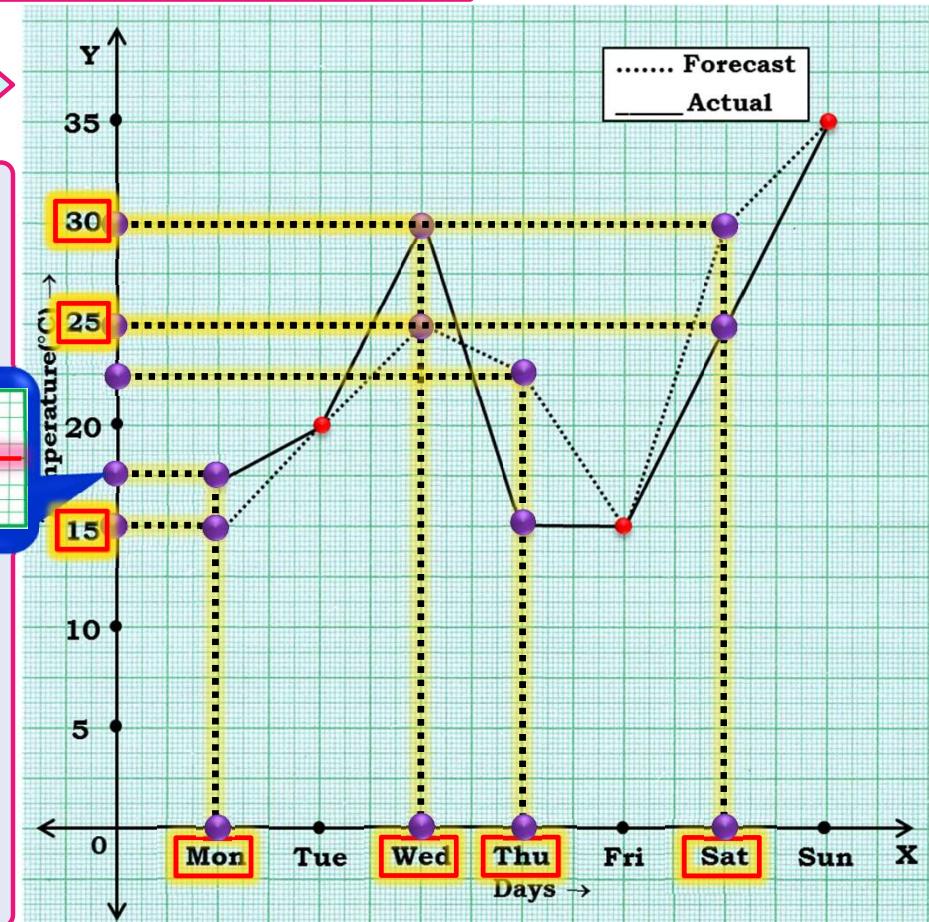
Sol :

During the Monday : $15 - 17.5 = 2.5$

During the Wednesday : $25 - 30 = 5$

During the Thursday : $15 - 22.5 = 7.5$

During the Saturday : $25 - 30 = 5$



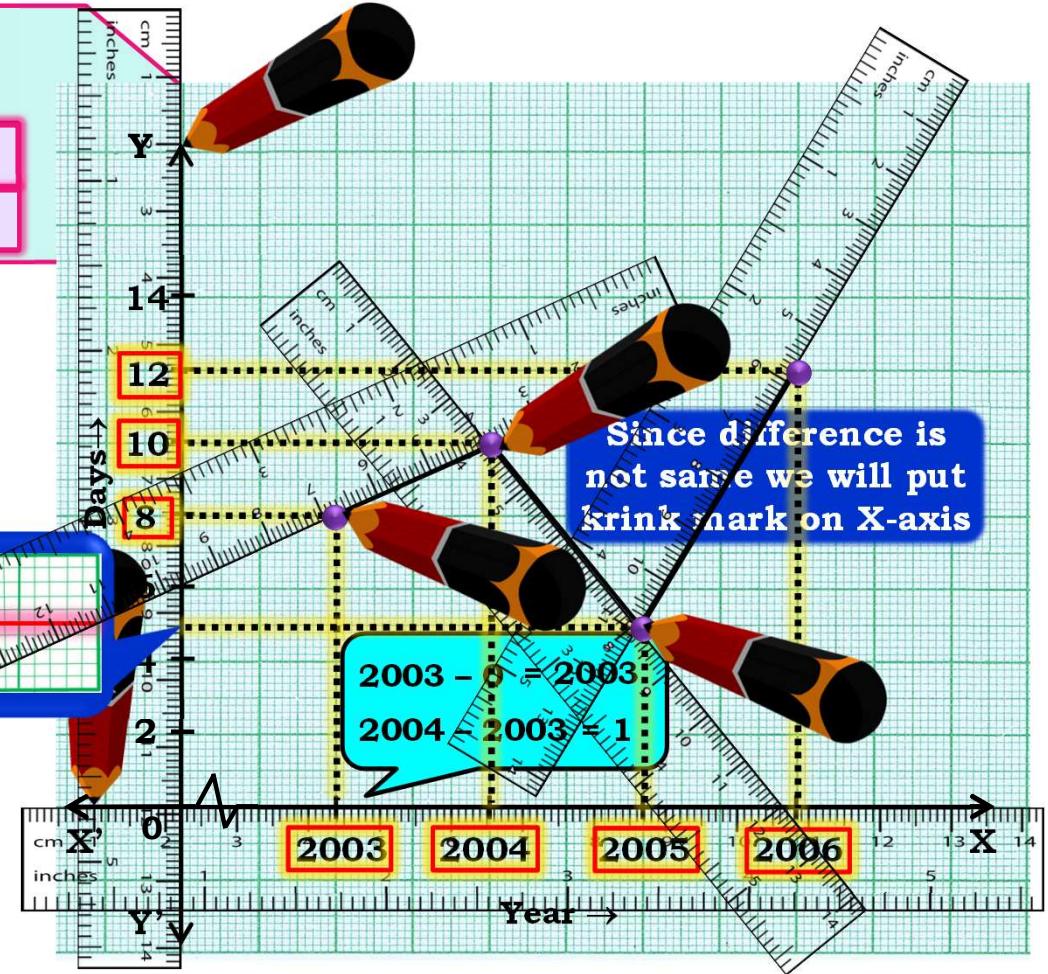
5

Use the tables below to draw linear graphs.

- (a) The number of days a hill side city received snow in different years.

Year	2003	2004	2005	2006
Days	8	10	5	12

Sol :



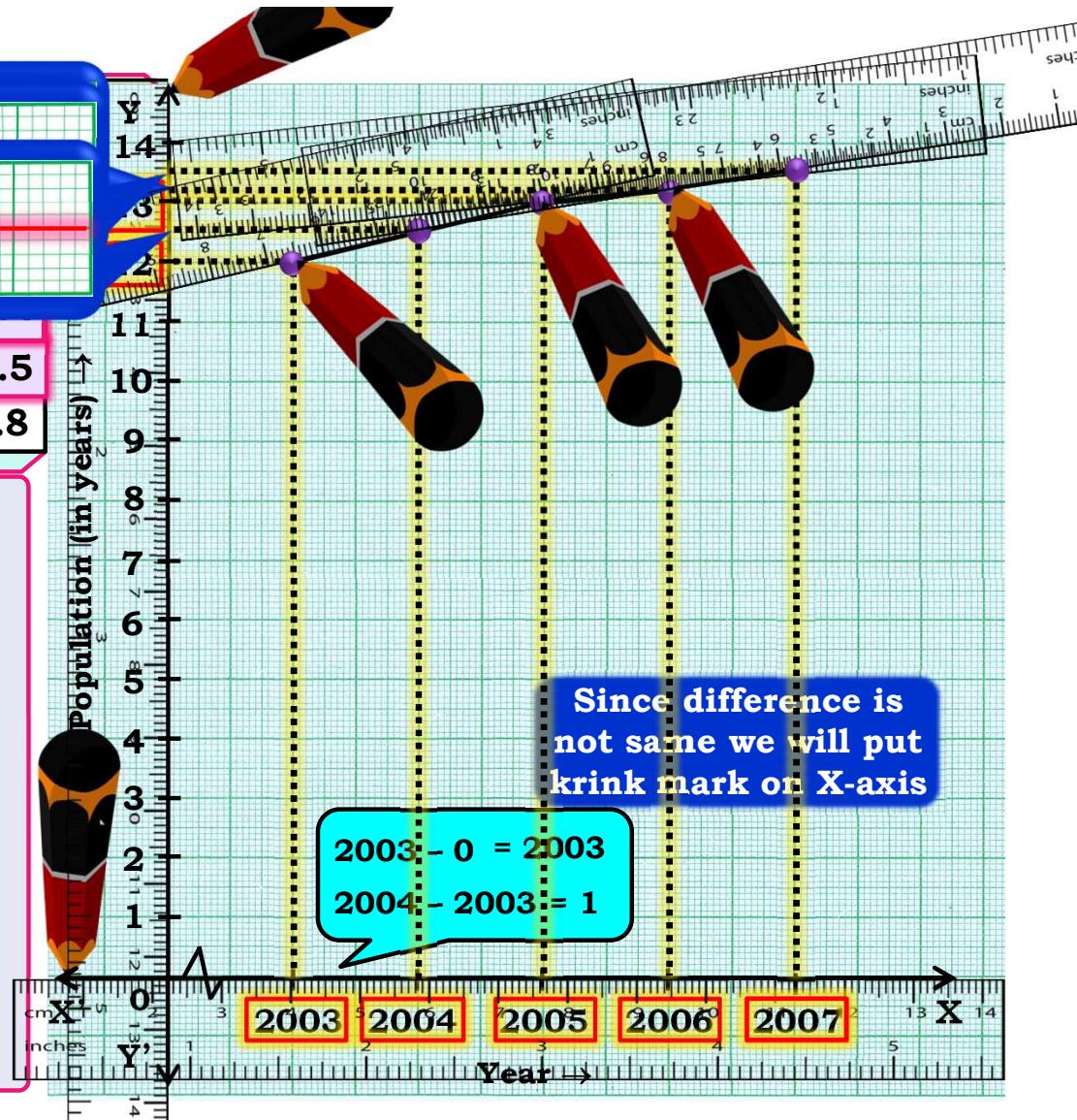
5

Use the tables below to draw 1

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

Year	2003	2004	2005	2006	2007
No. of Men	12	12.5	13	13.2	13.5
No. of Women	11.3	11.9	13	13.6	12.8

Sol :



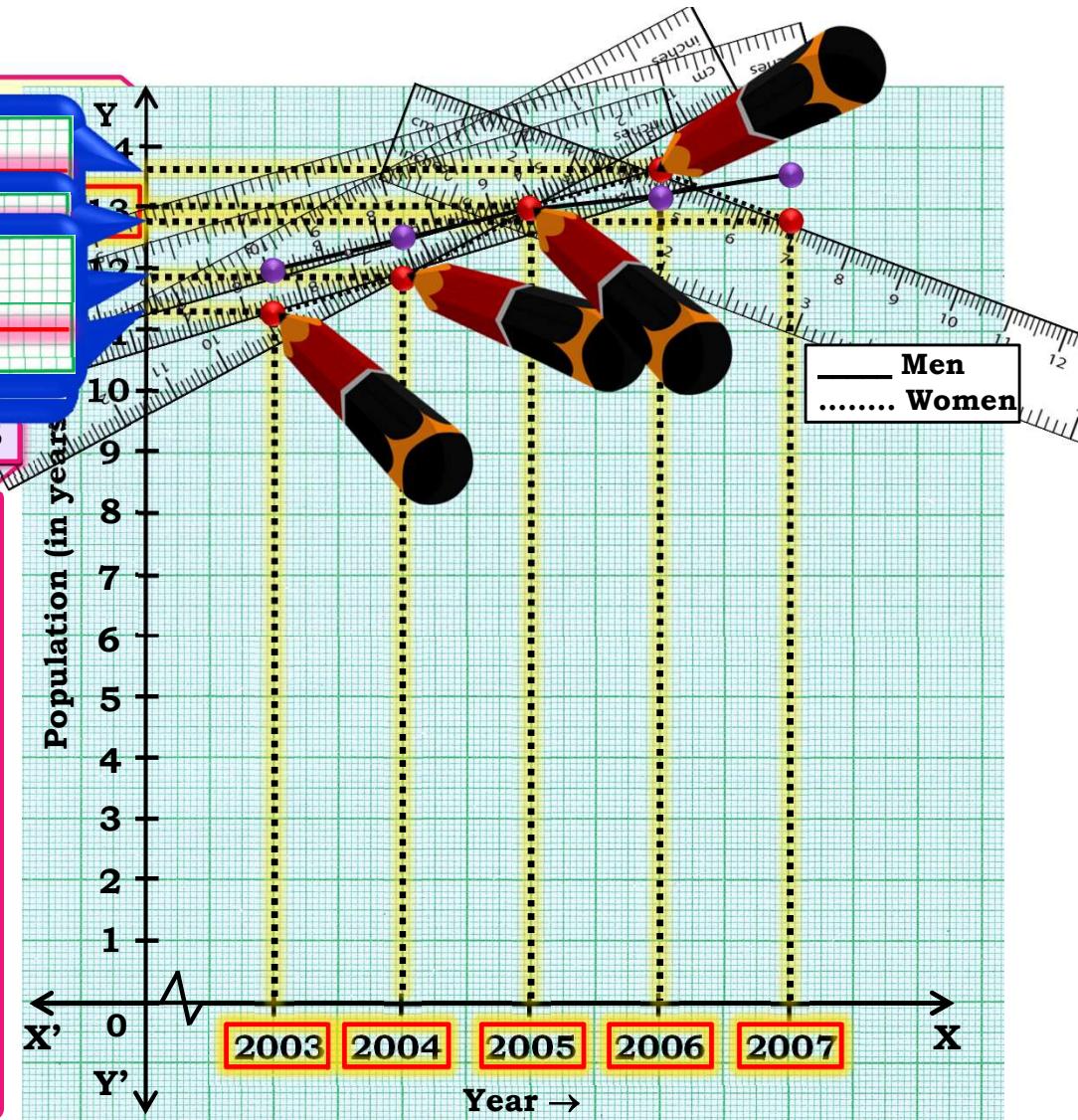
5

Use the tables below to draw line graphs for men and women.

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

Year	2003	2004	2005	2006	2007
No. of Men	12	12.5	13	13.6	11
No. of Women	11.3	11.9	13	13.6	12.8

Sol :



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 ?

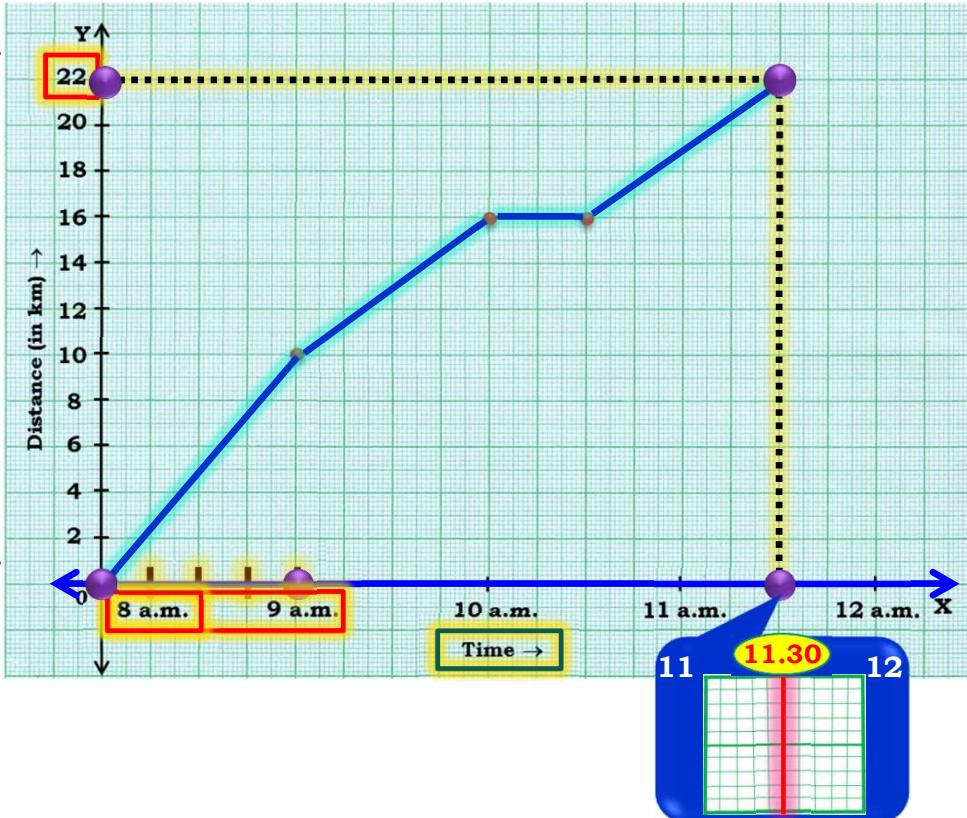
Sol : 4 units = 1 hour

(b) How much time did the person take for the travel ?

Sol : $8 - 11:30 = 3\frac{1}{2}$ hrs

(c) How far is the place of merchant from the town ?

Sol : It was 22 km far from the town.



6

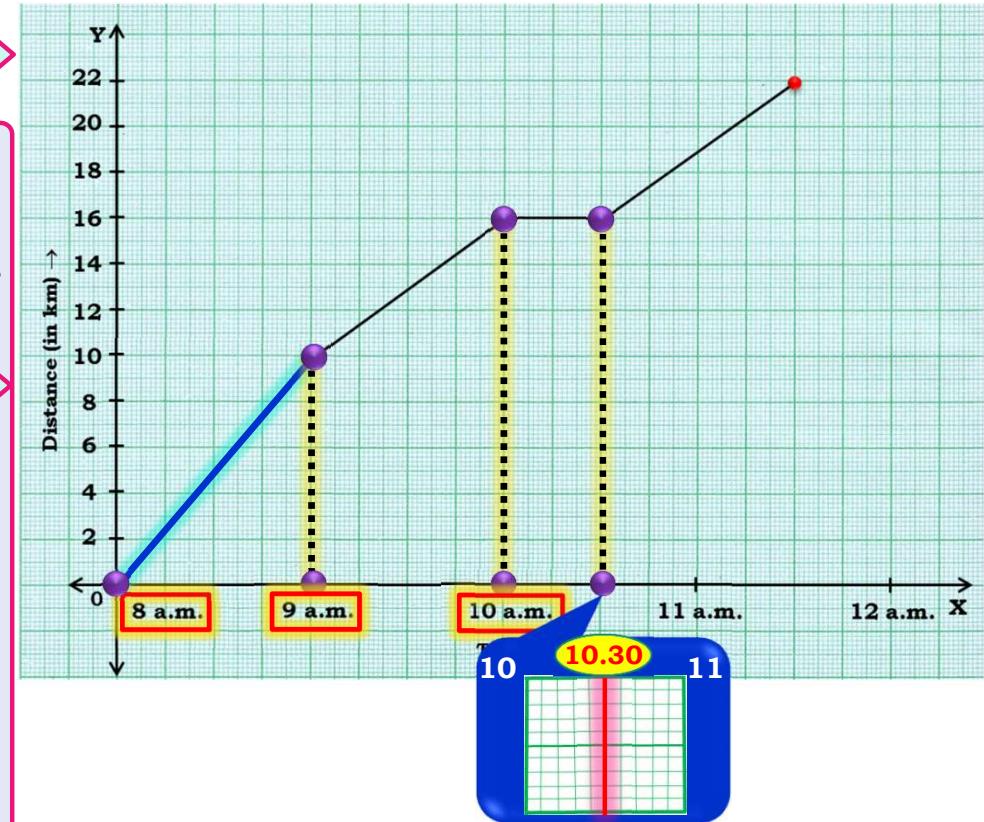
A courier-person cycles from a town to a neighbouring suburban area to deliver a parcel to a merchant. His distance from the town at different times is shown by the following graph.

- (d) Did the person stop on his way ?
Explain.

Sol : Yes, this has been indicated by the horizontal part of the graph.
He stayed from 10 am to 10:30 am.

- (e) During which period did he ride fastest ?

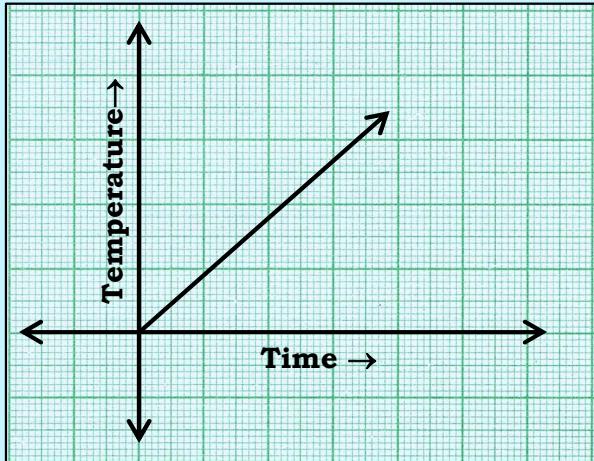
Sol : He rode the fastest between 8 am and 9 am.



7

Can there be a time-temperature graph as follows ?
Justify your answer.

(i)

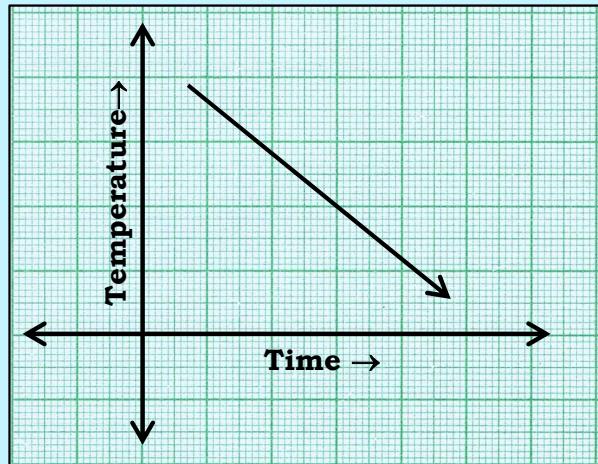


Sol : It is showing the increase in temperature.

7

Can there be a time-temperature graph as follows ?
Justify your answer.

(ii)

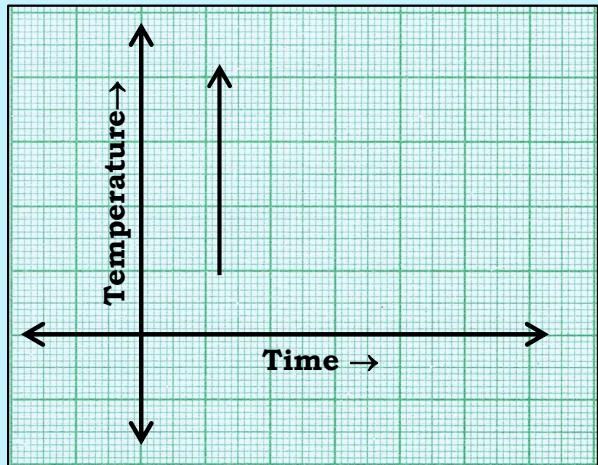


Sol : It is showing the decrease in temperature.

7

Can there be a time-temperature graph as follows ?
Justify your answer.

(iii)



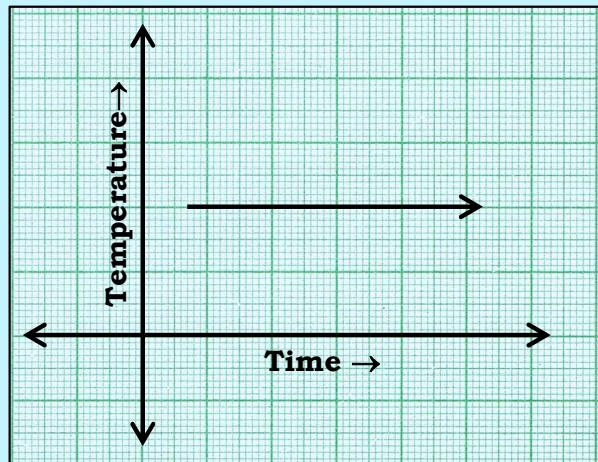
Sol :

The graph figure (iii) is not possible since temperature is increasing very rapidly which is not possible.

7

Can there be a time-temperature graph as follows ?
Justify your answer.

(iii)



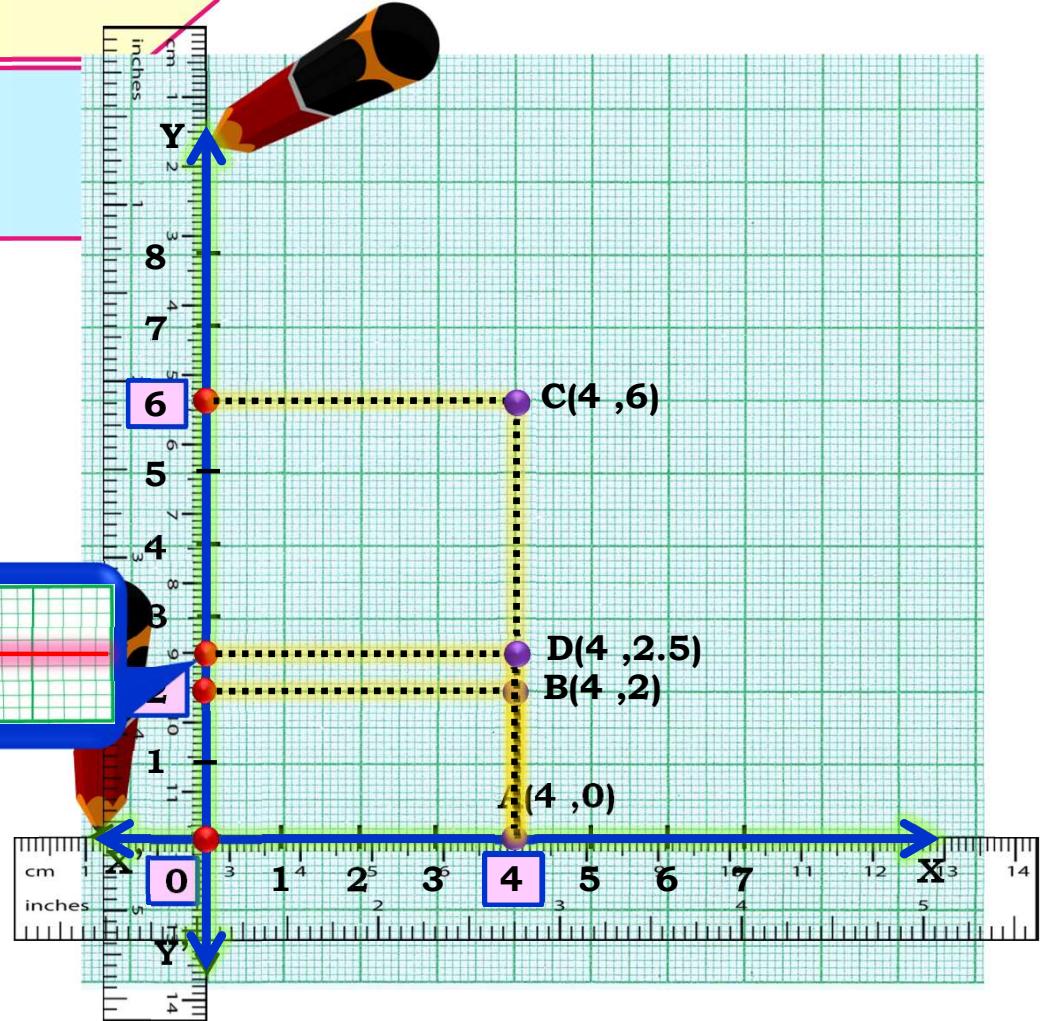
Sol : It is showing constant temperature.

Exercise 15.2

1

Plot the following points on a graph sheet.
Verify if they lie on a line.

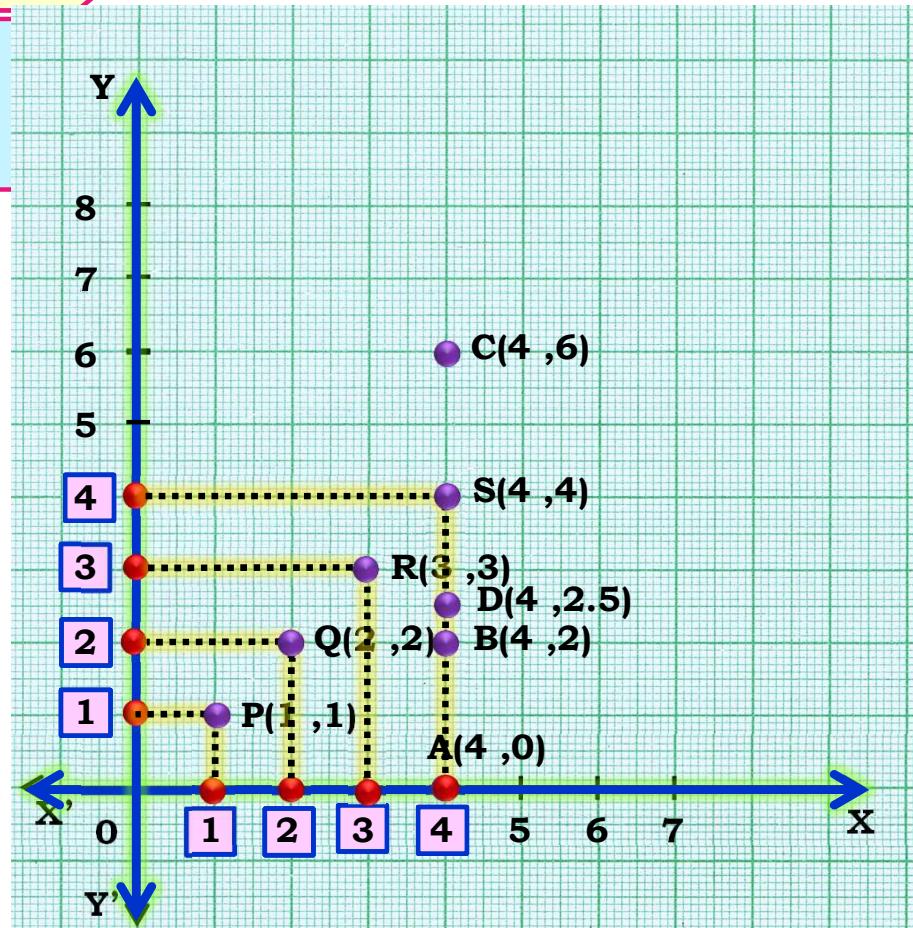
- (a) A(4, 0), B(4, 2), C(4, 6), D(4, 2.5)
- (b) P(1, 1), Q(2, 2), R(3, 3), S(4, 4)
- (c) K(2, 3), L(5, 3), M(5, 5), N(2, 5)



1

Plot the following points on a graph sheet.
Verify if they lie on a line.

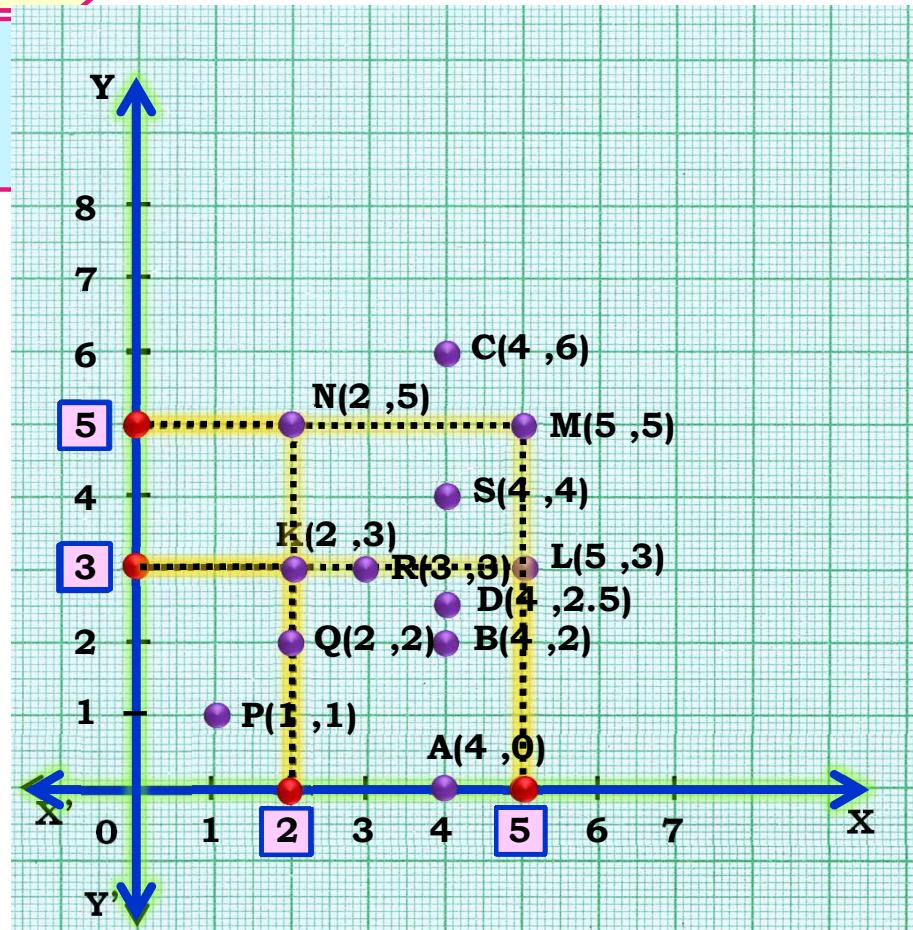
- (a) A(4, 0), B(4, 2), C(4, 6), D(4, 2.5)
- (b) P(1, 1), Q(2, 2), R(3, 3), S(4, 4)
- (c) K(2, 3), L(5, 3), M(5, 5), N(2, 5)



1

Plot the following points on a graph sheet.
Verify if they lie on a line.

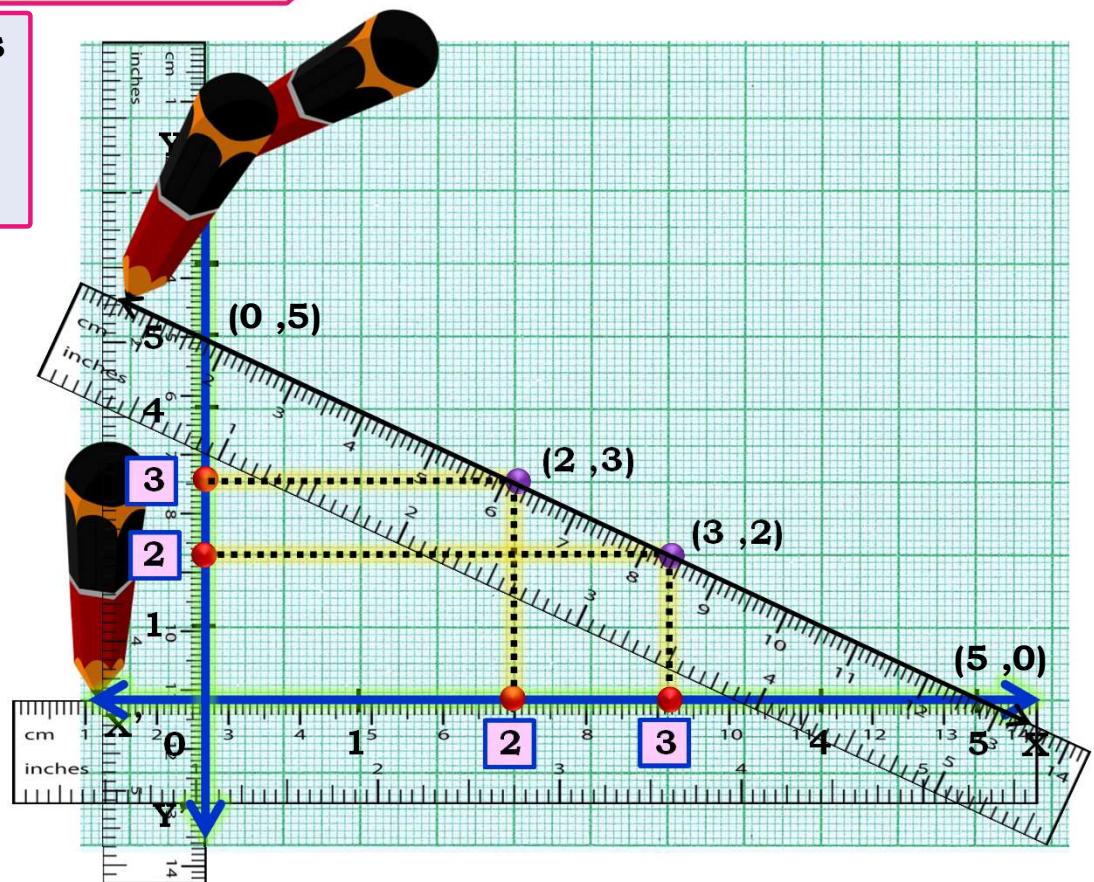
- (a) A(4, 0), B(4, 2), C(4, 6), D(4, 2.5)
- (b) P(1, 1), Q(2, 2), R(3, 3), S(4, 4)
- (c) K(2, 3), L(5, 3), M(5, 5), N(2, 5)



2

Draw the line passing through $(2, 3)$ and $(3, 2)$.
Find the coordinates of the point at which
this line meets the x-axis and y-axis.

Sol : The coordinates of the points
at which this line meets the
x-axis at $(5, 0)$ and y-axis at
 $(0, 4.5)$



3

Write the coordinates of the vertices of each of these adjoining figures.

Sol : Vertices of figure OABC

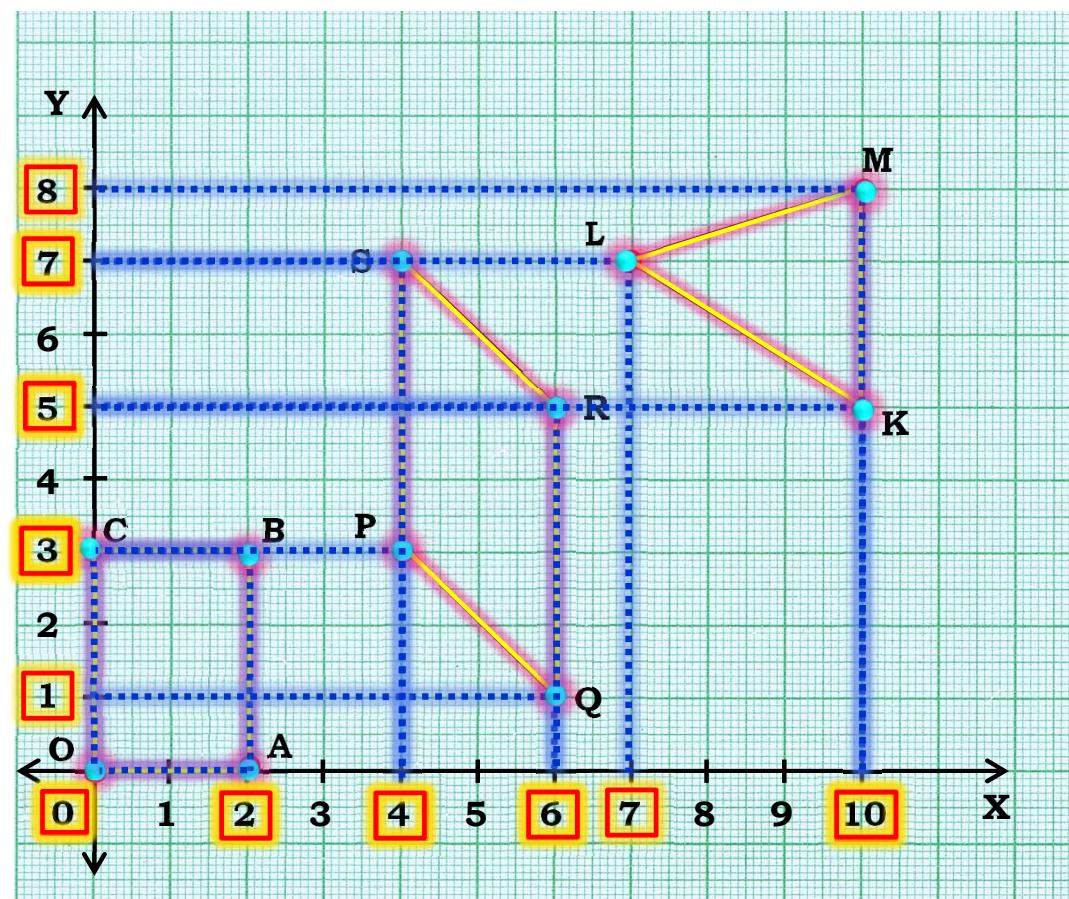
O(0, 0) A(2, 0) B(2, 3) C(0, 3)

Vertices of figure PQRS

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

Vertices of figure LMK

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



4

State whether True or False. Correct that are false.

- (a) A point whose x coordinate is zero and y-coordinate is non-zero will lie on the y-axis.

Sol : True

- (b) A point whose y coordinate is zero and x-coordinate is 5 will lie on y-axis.

Sol : False, it will lie on x-axis.

- (c) The coordinates of the origin are (0, 0).

Sol : True

Exercise 15.3

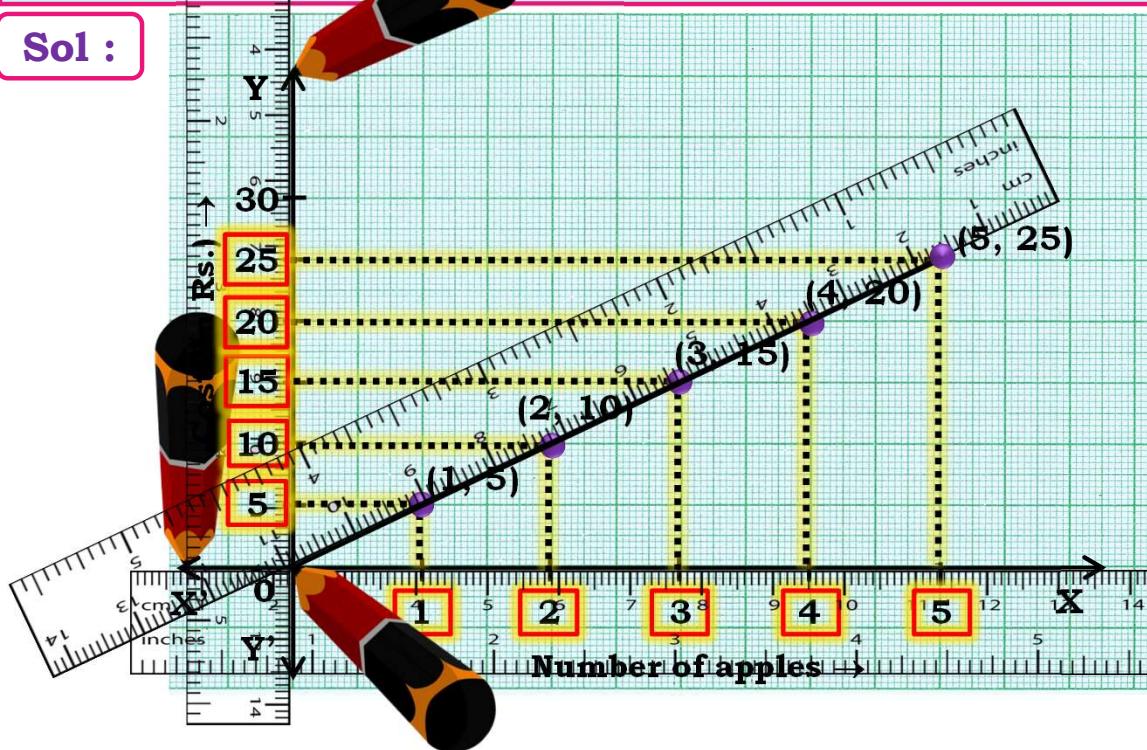
1

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

(a) Cost of apples

No. of apples	1	2	3	4	5
Cost (in Rs)	5	10	15	20	25

Sol :

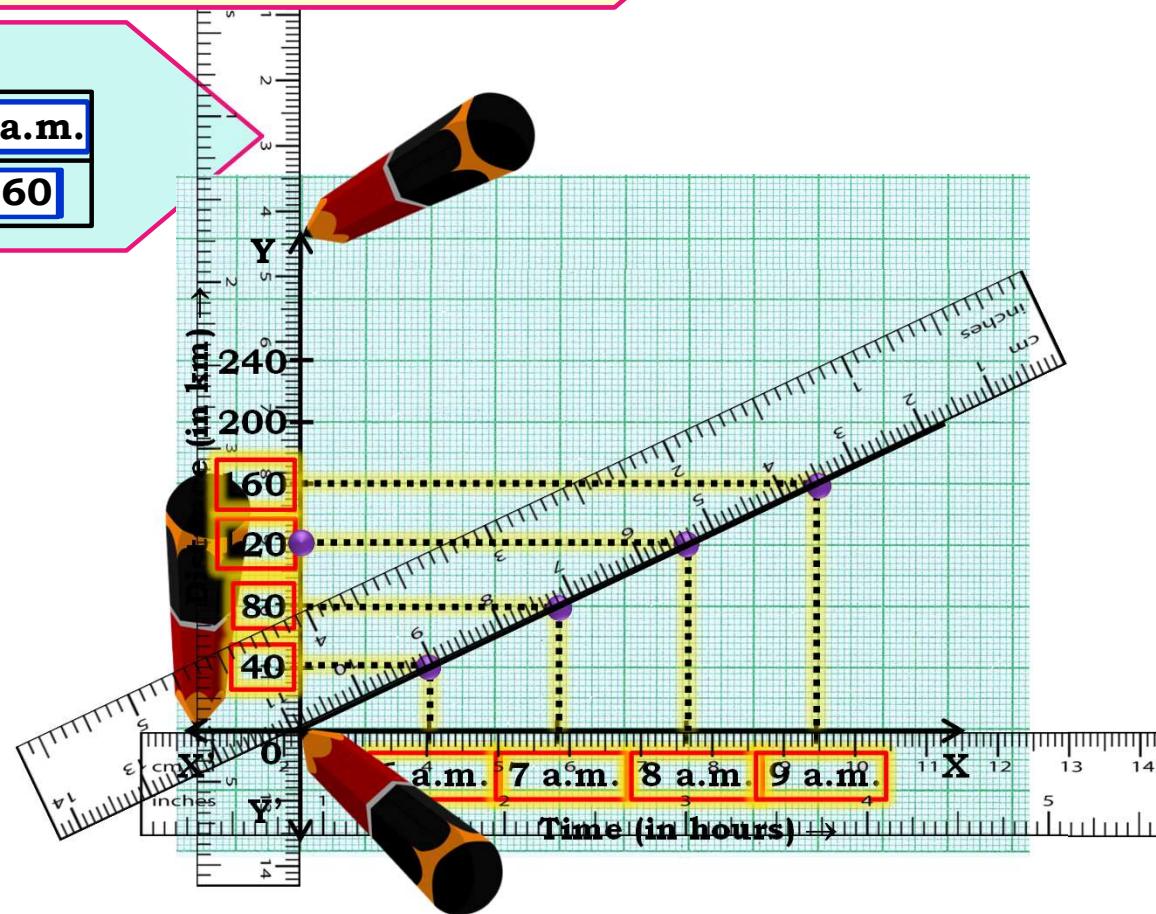


1

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

(b) Distance travelled by a car

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



1

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

(b) Distance travelled by a car

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

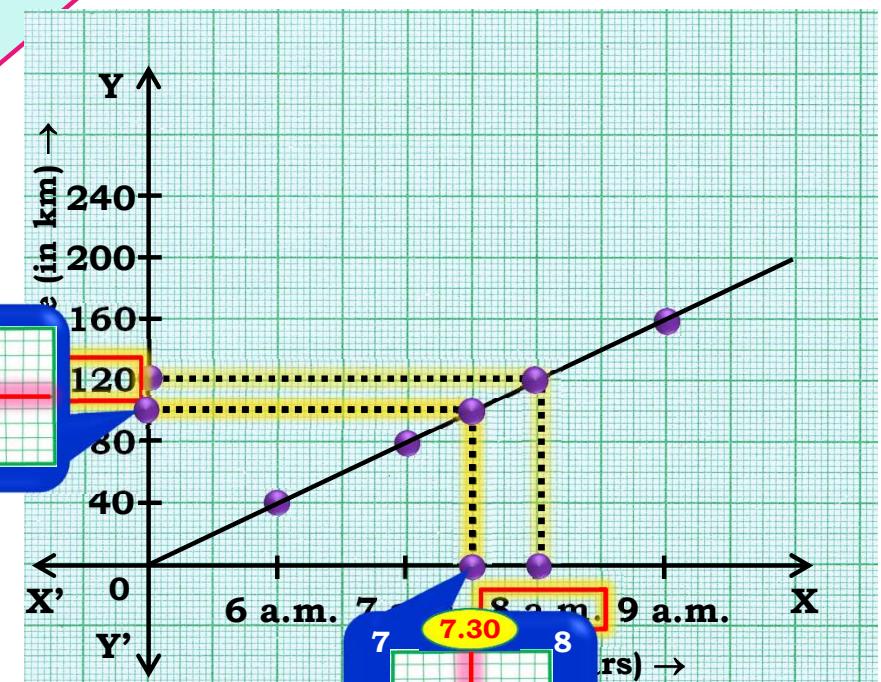
(i) How much distance did the car cover during the period 7.30 a.m. to 8 a.m. ?

Sol : $100 - 120 = 20$

The car covered 20 km distance.

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

Sol : At 7.30 am the car had covered 100 km.

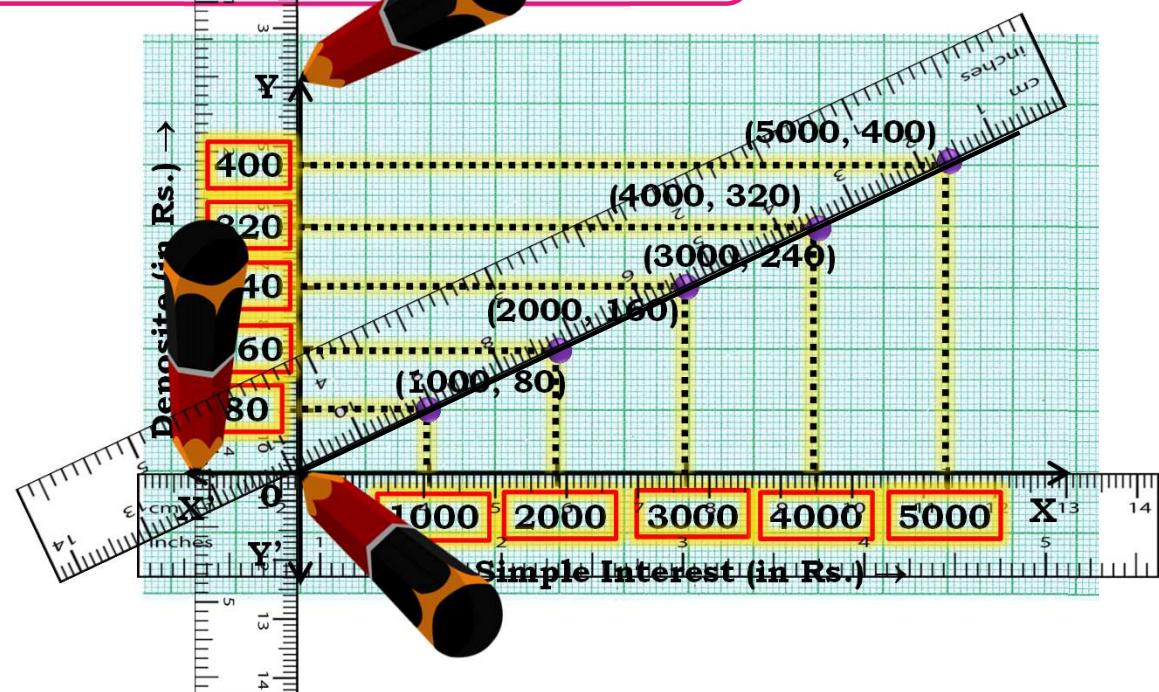


1

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

(c) Interest on deposits for a year

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



1

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

(c) Interest on deposits for a year

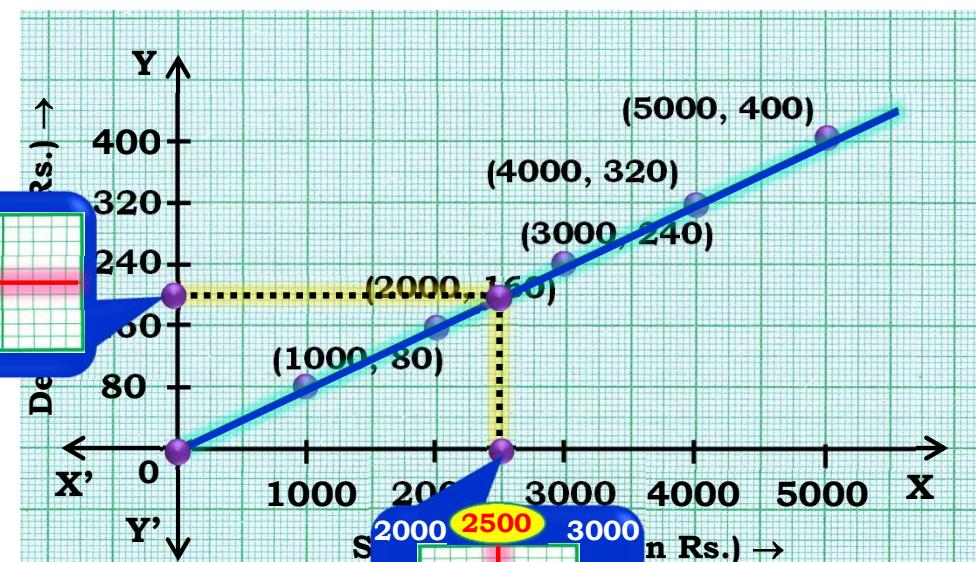
Deposite (in Rs.)	1000	2000	3000	4000	5000
Simple Interest (in Rs.)	80	160	240	320	400

(i) Does the graph pass through the origin ?

Sol : Yes, the graph passes through the origin.

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

Sol : Interest on Rs. 2500 is Rs. 200 for a year.



1

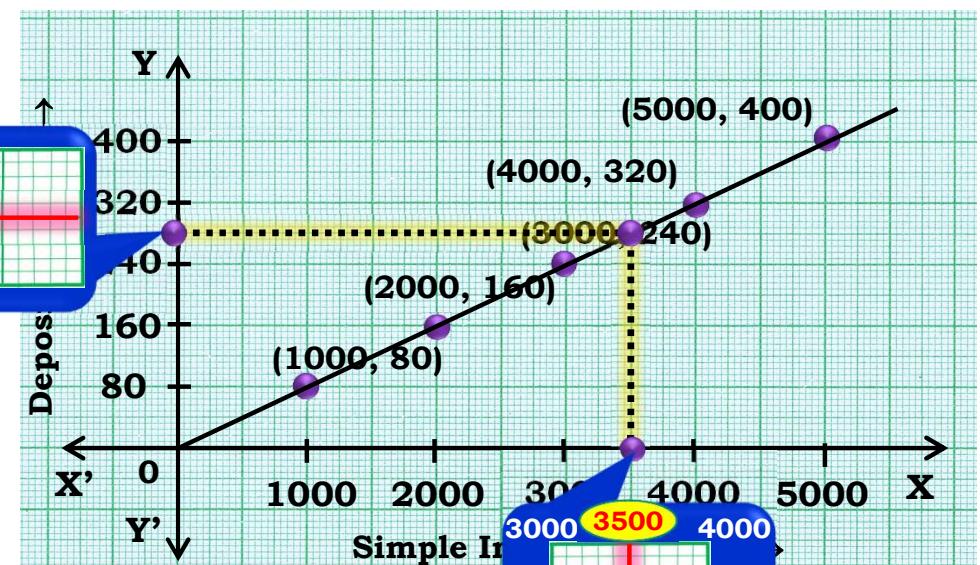
Draw the graphs for the following tables of values, with suitable scales on the axes.

(c) Interest on deposits for a year

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

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

Sol : Rs. 3500 should be deposited for interest of Rs. 280.



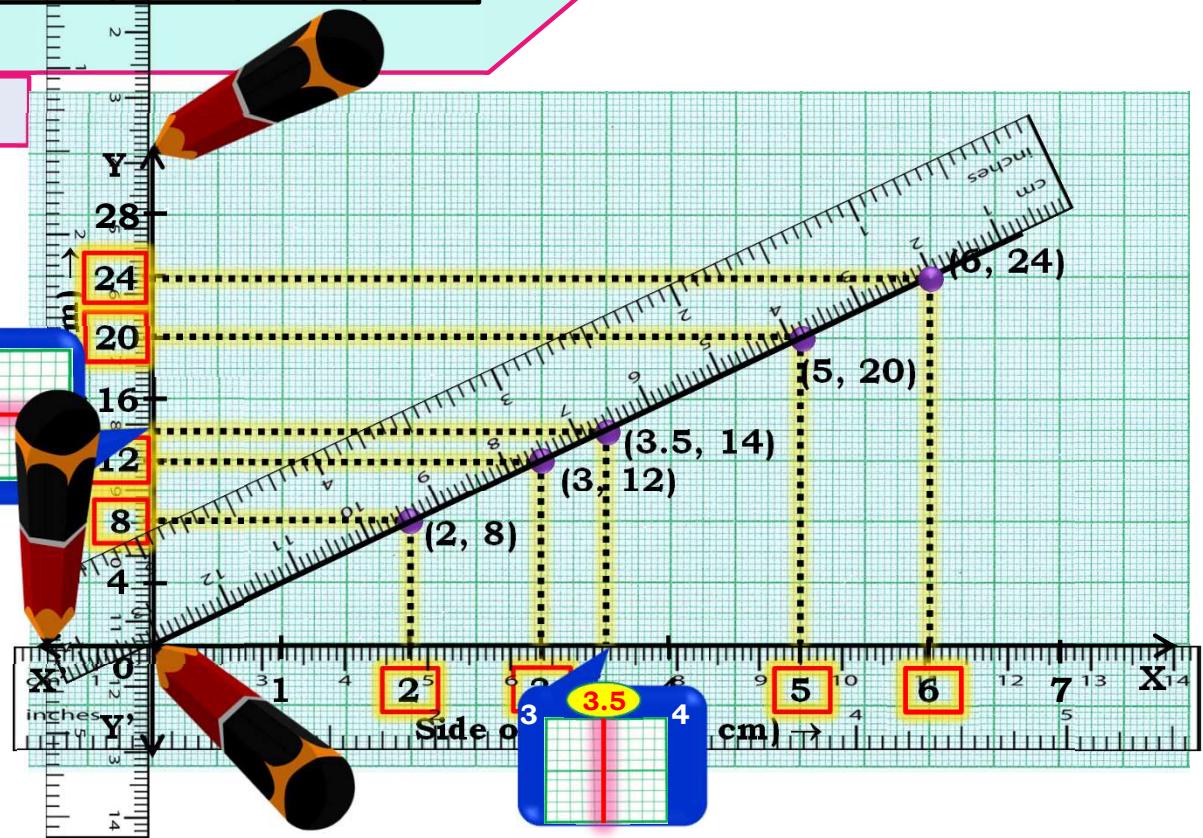
2

Draw the graphs for the following

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

Is it linear graph ?

Sol : Yes, it is a linear graph



2

Draw the graphs for the following

(ii) Side of Square (in cm)

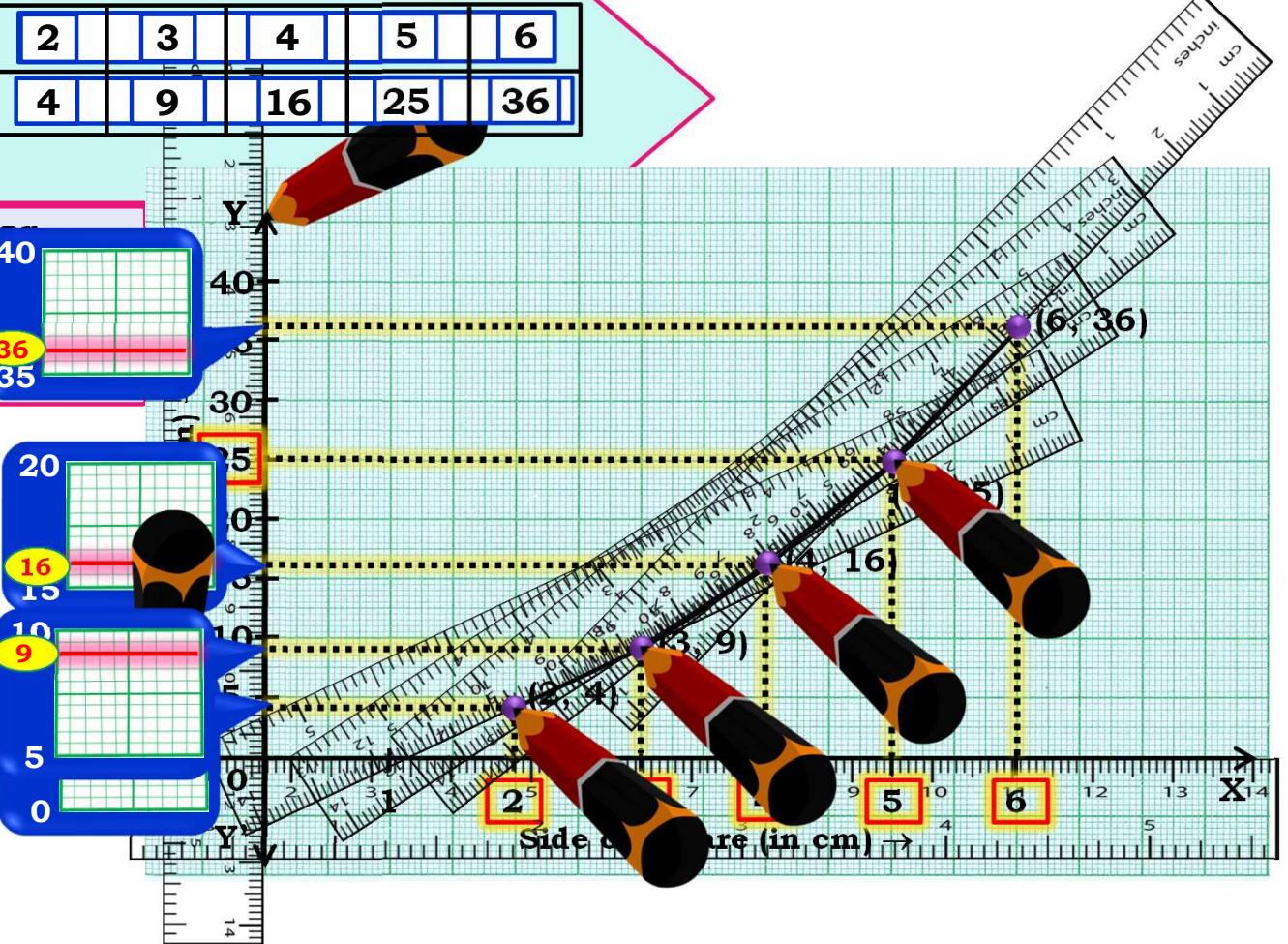
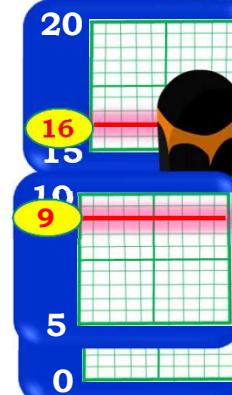
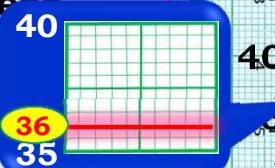
2	3	4	5	6
---	---	---	---	---

Perimeter (in cm)

4	9	16	25	36
---	---	----	----	----

Is it linear graph ?

Sol : No, it is not a linear graph because the graph does not provide straight line.



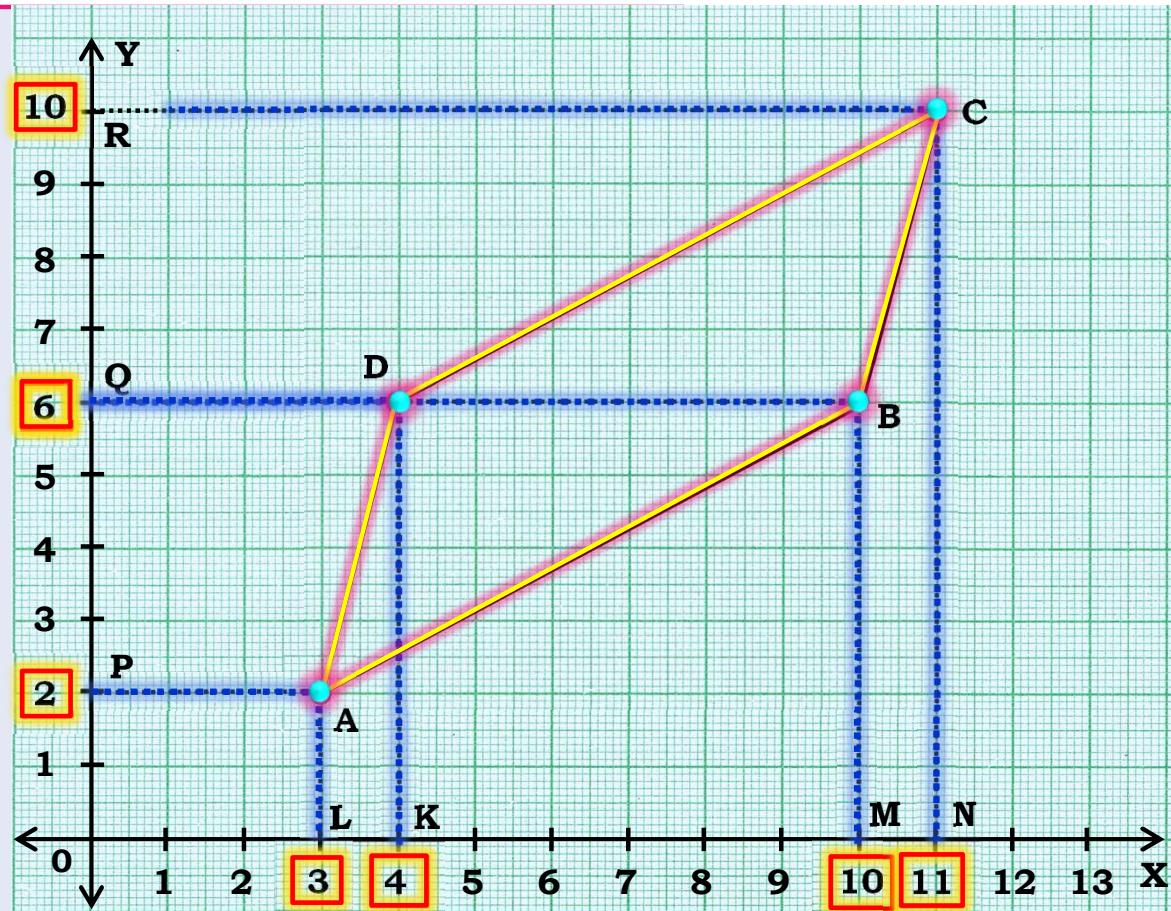
Additional sums

1

Write the co-ordinates of the vertices of the following figure :

Sol. Vertices of figure ABCD

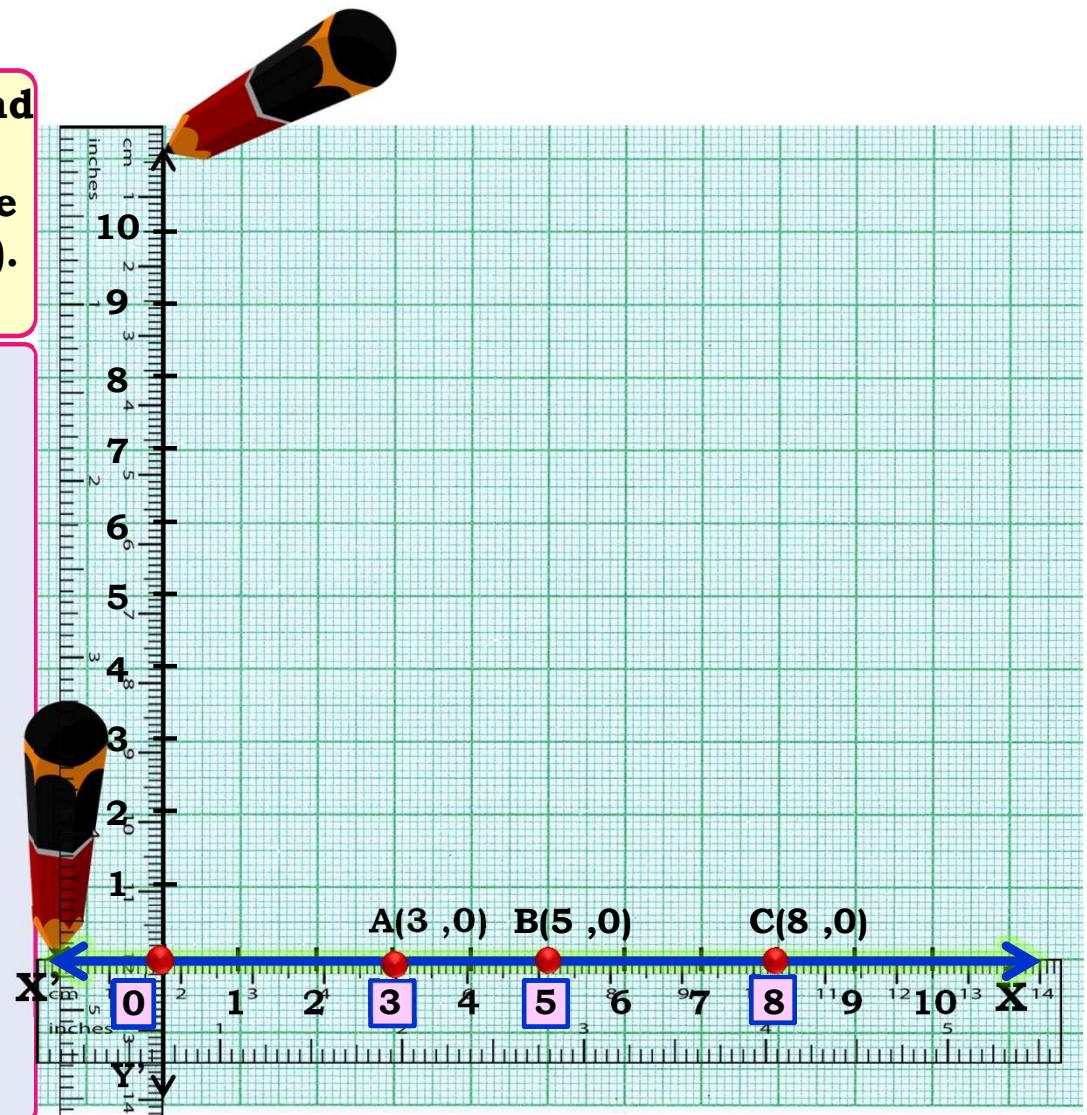
A(3, 2) B(10, 6) C(11, 10) D(4, 6)



2

Plot the points A(3, 0), B(5, 0) and C(8, 0). What do you observe where do they lie ? Also, plot the points P(0, 2), Q(0, 5) and R(0, 9). Do they lie on x-axis ?

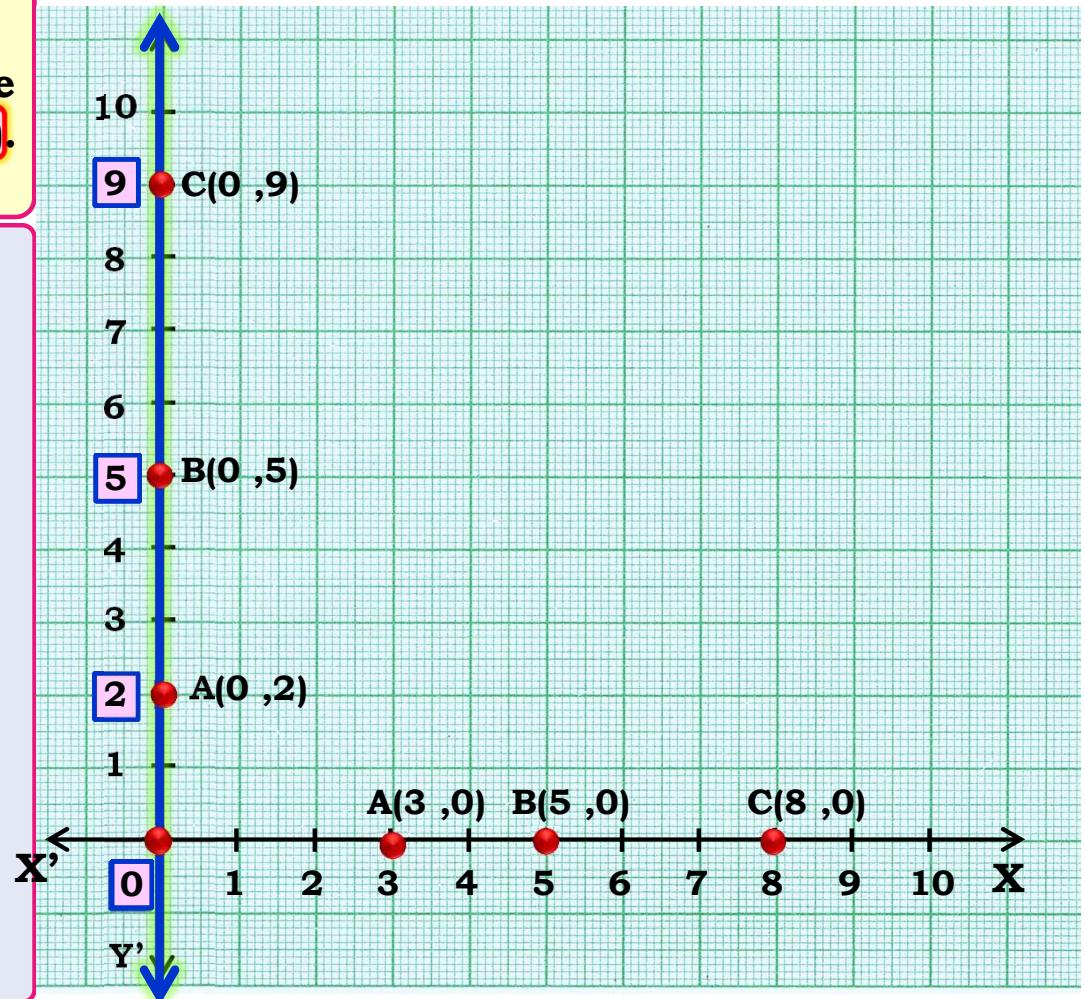
Sol :



2

Plot the points A(3, 0), B(5, 0) and C(8, 0). What do you observe where do they lie ? Also, plot the points P(0, 2), Q(0, 5) and R(0, 9). Do they lie on x-axis ?

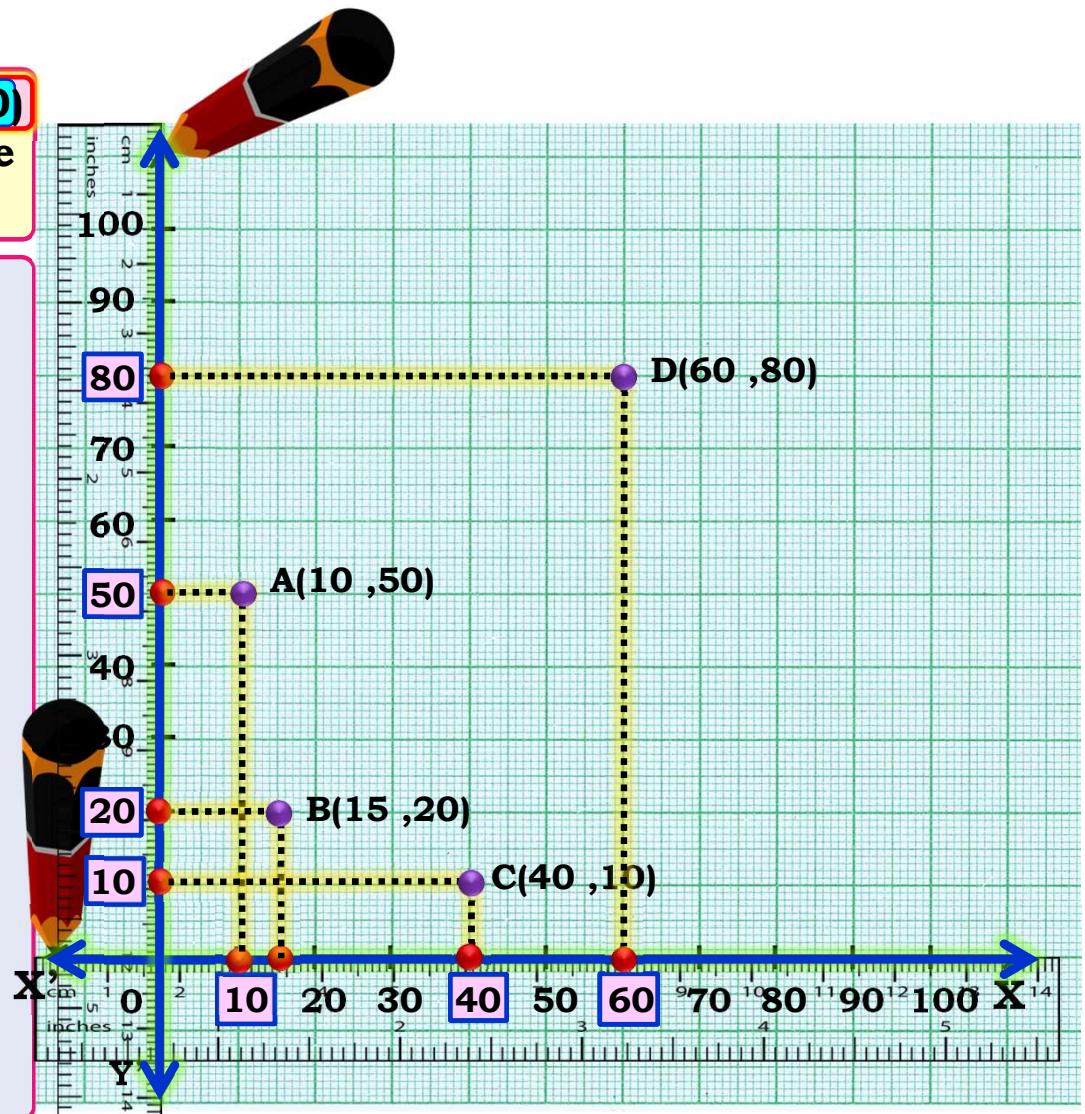
Sol :



3

Plot the points $A(10, 50)$, $B(15, 20)$,
and $C(40, 10)$ and $D(60, 80)$ on the
graph paper

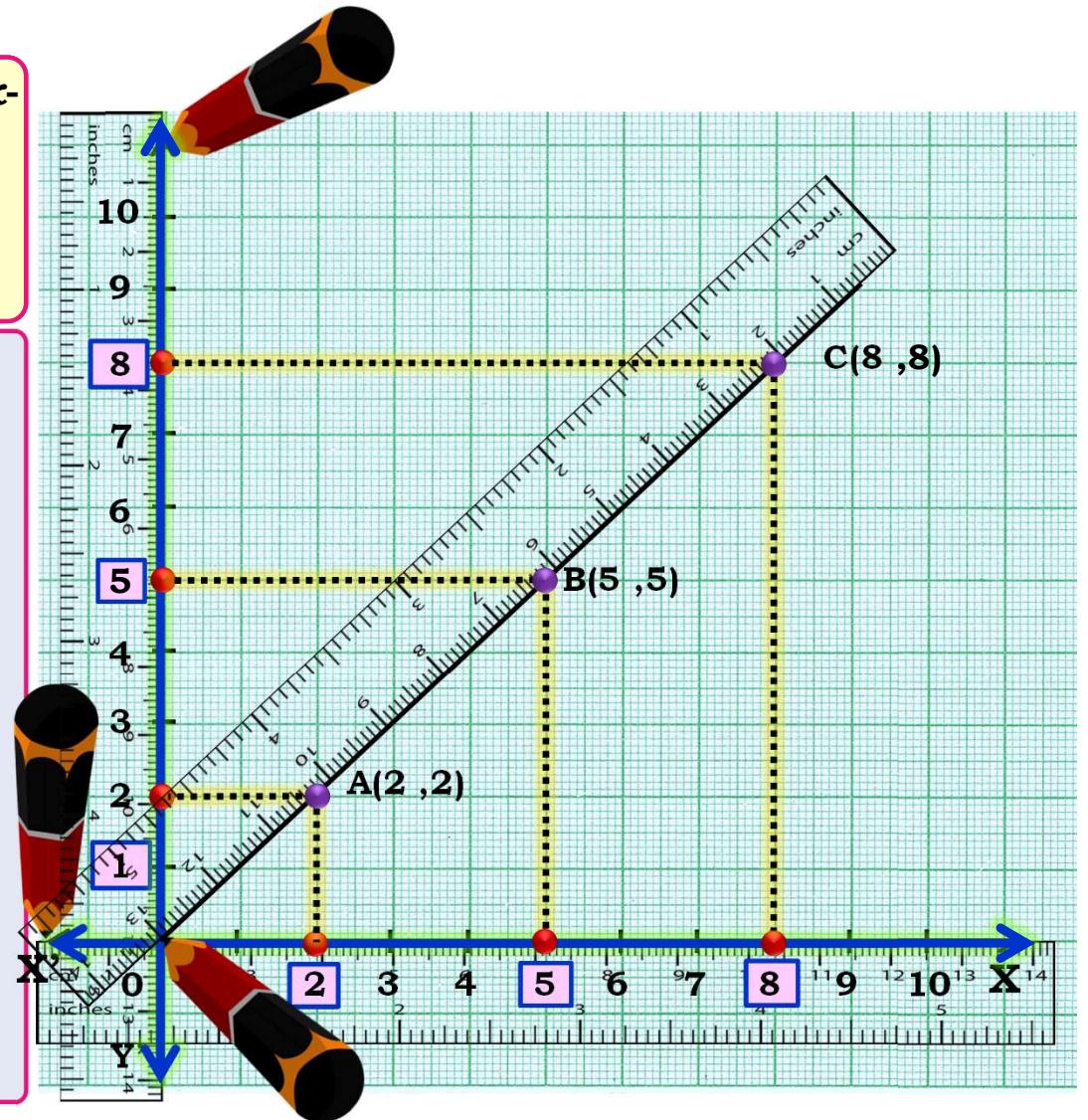
Sol :



4

Plot any three points such that x -coordinate of each point is equal to its y -co-ordinate. Join these points in pairs. Do they lie on a line passing through the origin ?

Sol :



5

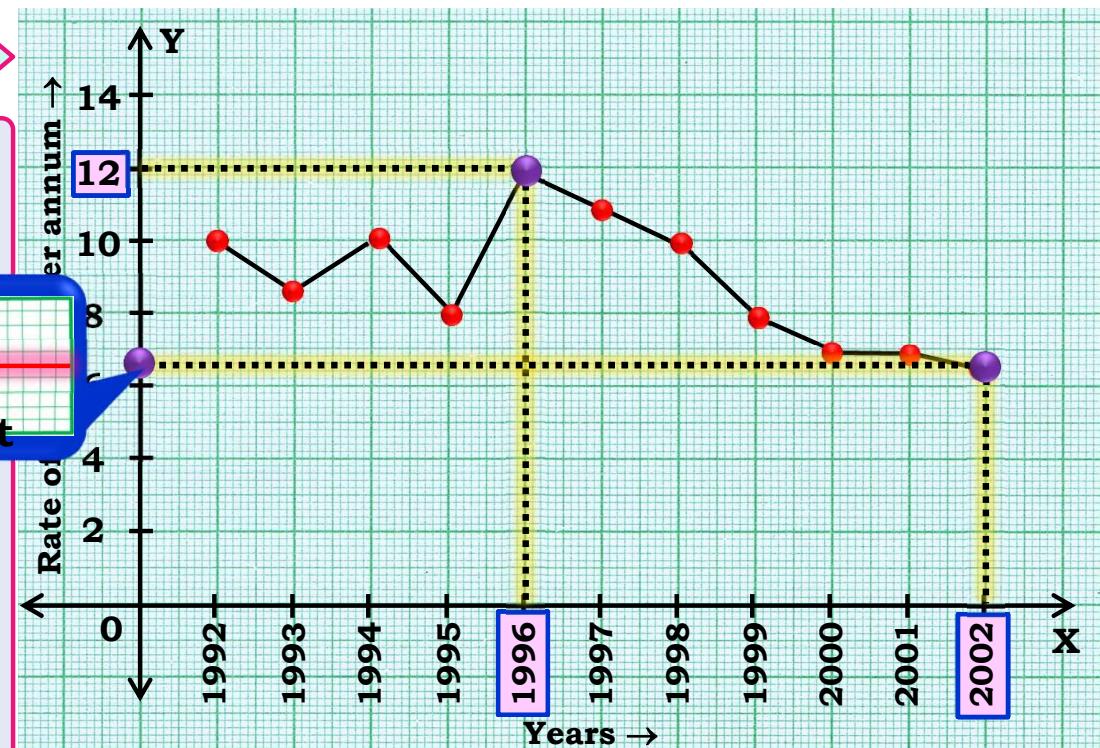
The graph shown in figure exhibits the rate of interest on fixed deposits upto one year announced by the reserved Bank of India in different years. Read the graph and find

(i) In which period was the rate of interest maximum ?

Sol : The rate of interest was maximum (12 %) in 1996.

(b) In which period was the rate of interest minimum ?

Sol : The minimum rate of interest was 6.5 % in the year 2002.



6

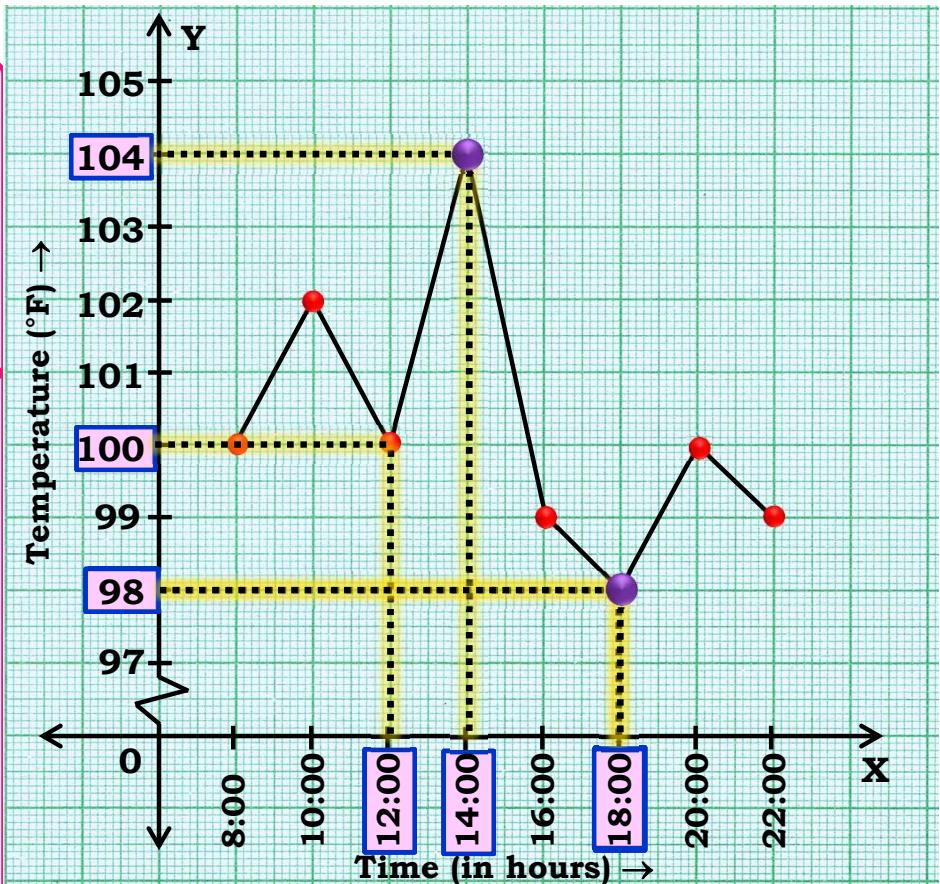
Given below is the temperature chart of a patient.

- (i) Find the temperature of the patient at 12:00 hours and 18:00 hours

Sol : The temperature of the patient at 12:00 hours is 100°F .
and at 18:00 hours the temperature is 98°F .

- (b) At what time is the temperature
(i) highest ? (ii) lowest ?

Sol : (i) The maximum temperature of the patient is 104°F at 14:00 hours.
(ii) the minimum temperature of the patient is 98°F at 18:00 hours.

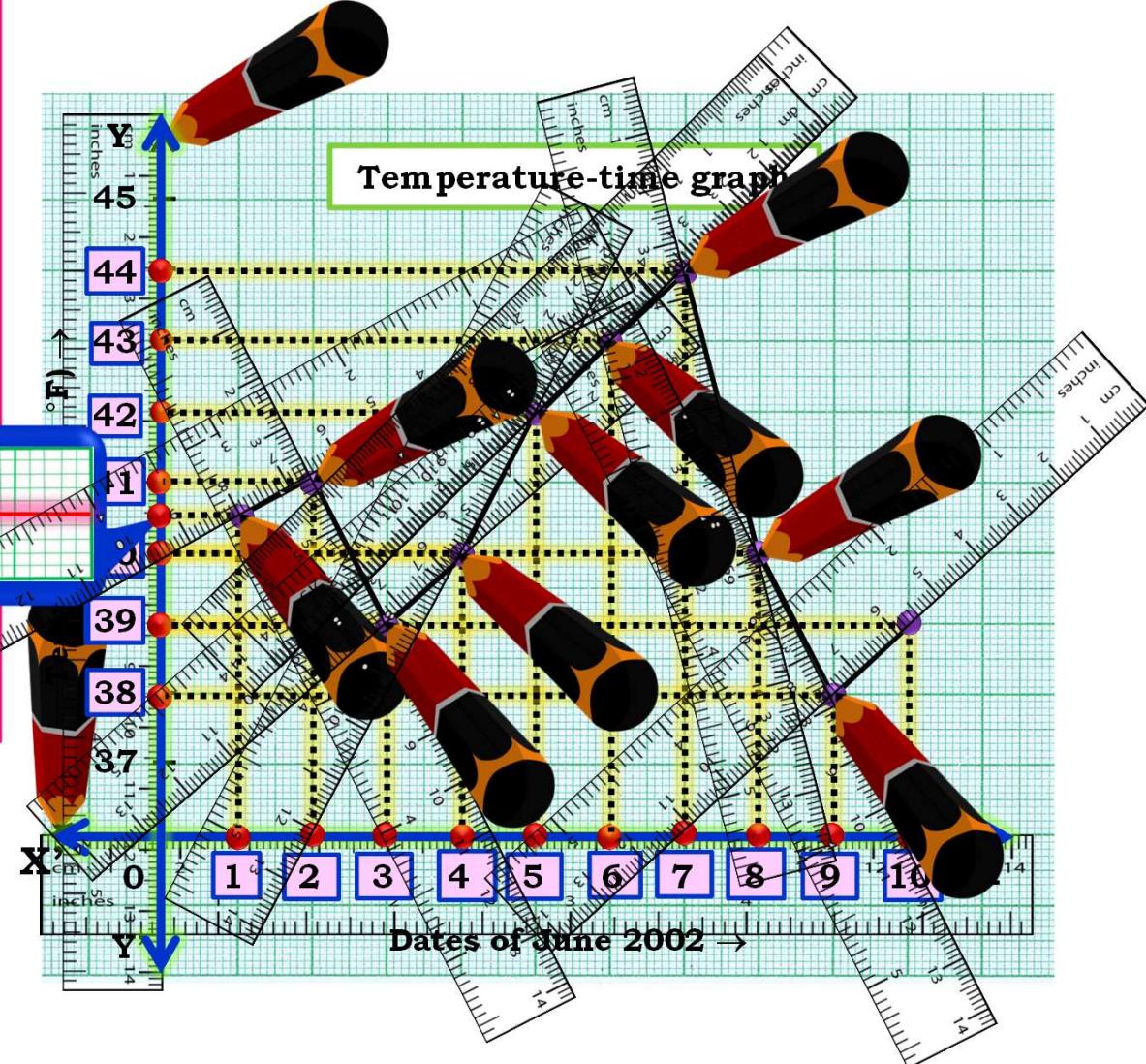


7

The maximum temperature on 10 days of June, 2002, in Delhi is given below :

Date	Max. temp. (in °C) :
1	40.5
2	41
3	39
4	40
5	42
6	43
7	44
8	40
9	38
10	39

Draw a temperature-time graph for the above data.

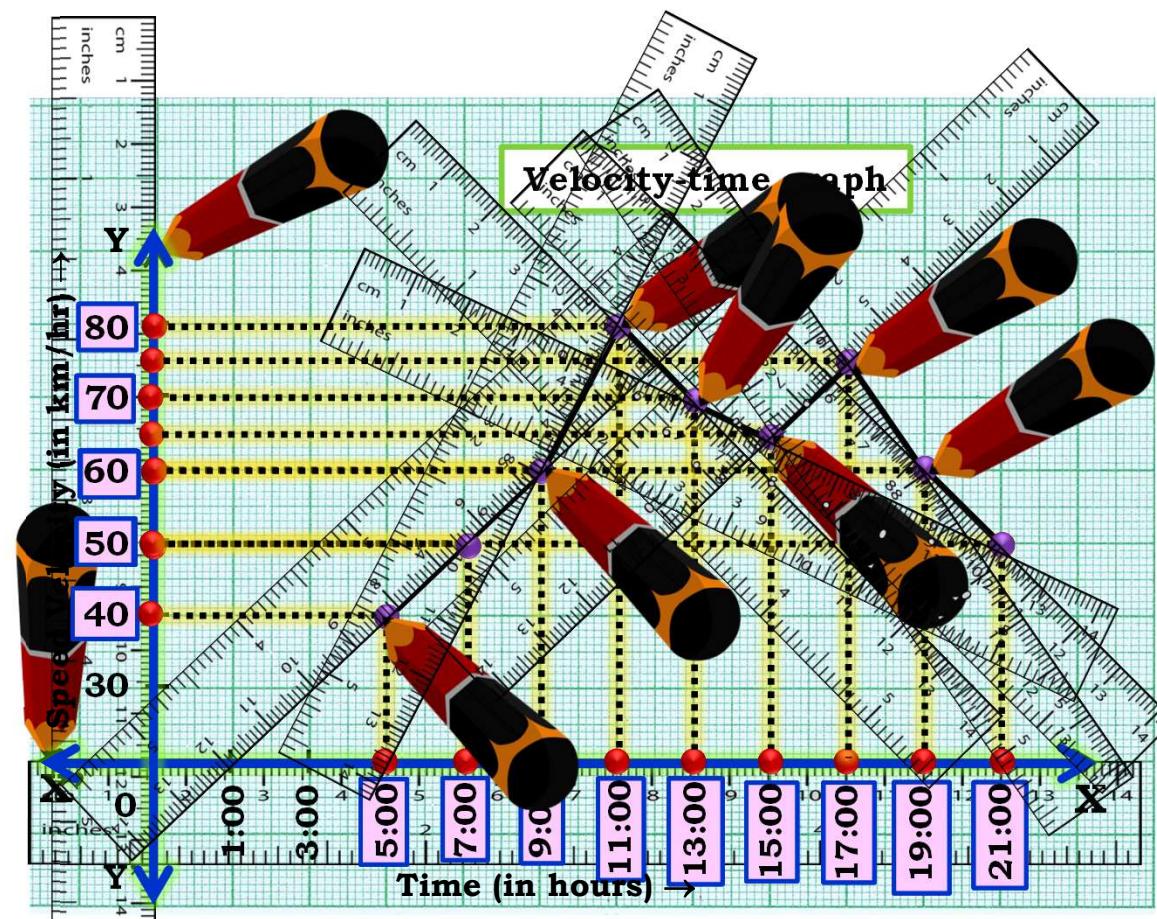


8

A car is going for a long journey of 16 hours, starting at 5:00 hrs. The speeds of the car at different hours are given below :

Time (in hours)	Speed(in km/hour):
5:00	40
7:00	50
9:00	60
11:00	80
13:00	70
15:00	65
17:00	75
19:00	60
21:00	50

Draw a velocity-time graph for the above data.



Q

The following graph shows temperature of a patient in a hospital, recorded every hour.

(a) What was the patient's temperature at 1 p.m. ?

Sol :

