MATHS

BOOKS - RS AGGARWAL MATHS (HINGLISH)

LINE GRAPHS AND LINEAR GRAPHS

Example

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

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

Draw a line graph for the above data and answer the questions that follow :

(i) What was the height of the child at the age of 5 years ?

(ii) How much taller was the child at the age of 10 than at the age of 6 ?

(iii) Between which two consecutive periods did the child grow faster ?

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2. The table given below shows the data collected for Tanvy's walking on a road.

Time (in minutes)	0	5	10	15	20	25
Distance (in km)	0	0.5	1	1.25	1.5	1.75

Draw a line graph for the given data using a suitable scale and answer the questions given below :

(i) In what time periods did Tanvy make the most progress ?

(ii) What is the ratio of the total distance covered in 15 minutes to that covered in 25 minutes ?

(iii) What is the percentage increase in

distance covered in 15 minutes as compared to that in 10 minutes ?

3. The table given below shows the population (in thousands) of men and women in a village in different years.

Year	2013	2014	2015	2016	2017
Number of men	11.5	12.4	13	13.8	14.2
Number of women	10.5	11.7	13	14.2	15.0

Draw two line graphs for the above data, using a suitable scale and answer the questions given below :

(i) Find the ratio of the male population and female population in the year 2013.

(ii) Find the ratio of the total population of the village in 2015 to that in 2017.

(iii) Find the percentage increase in the population of women in 2017 as compared to that in 2014

(iv) Between which two years in the increase % in the number of men maximum?

4. When Reenu fell sick, her doctor maintained a record of her body temperature taken every hour, as shown in the following graph.
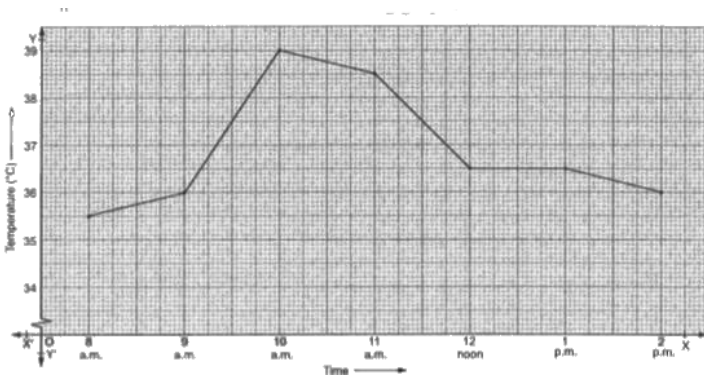
Read the graph carefully and answer the questions given below :

(*i*) What was the patient's temperature at 12 noon ?

(*ii*) When was the patient's temperature

$38.5°C$?

(iii) What was the patient's temperature at 12.30 p.m. ? Why ?

(iv) During which period of time did the patient's temperature show an upward trend ?

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

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5. The graph given below shows the journey of a man who started from his home and returned at the end of the day. Study the graph carefully and answer the questions that follow.

(i) At what time did the man start from his home ?

(ii) How much distance did he cover in the first four hours of his journey ?

(iii) What was he doing from 3 p.m. to 5 p.m. ?

(iv) What was the total distance travelled by him during the day ?

(v) How much distance did he travel in the first 8 hours of his journey ?

(vi) By what time could he cover 16 km of his journey ?

(vii) At what time did he return home ?

$(viii)$ Calculate the average speed of the man from (a) A to B and (b) B to C .

6. The double line graph given below gives the actual and expected sales of cars of a company for six 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 month was the difference between the actual and expected sales the maximum ?

(iii) For which month was the difference in actual and expected sales the least ?

(*iv*) What was the total sales of cars in the months of January. February and March ?

(*v*) What is the average sales of cars in the last 3 months ?

(*vi*) Find the ratio of sales in the first 3 months to that in the last 3 month?

7. The double line graph given below shows the marks obtained out of 10 by Madhu in two different tests. Study the graph and answer

the questions that follow :

(*i*) What information is represented by the

axes ?

(*ii*) In which subject did she score the highest

in Test *I* ?

(*iii*) In which subject did she score the least

in Test *II* ?

(*iv*) What are the marks scored by her in

social science in Test *II* ?

(*v*) In which test was the performance better ?

(*vi*) In which subject and which test did she

score full marks ?

8. The given graph represents the total runs scored by two batsmen A and B durin each of the ten different matches in the year 2017. Study the graph and answer the questions that follow :

Batsman A ---- --
Batsman B ———

Total runs scored

115
110
100
90
80
70
60
50
40
30
20
10
O   1   2   3   4   5   6   7   8   9   10
Match number ——►
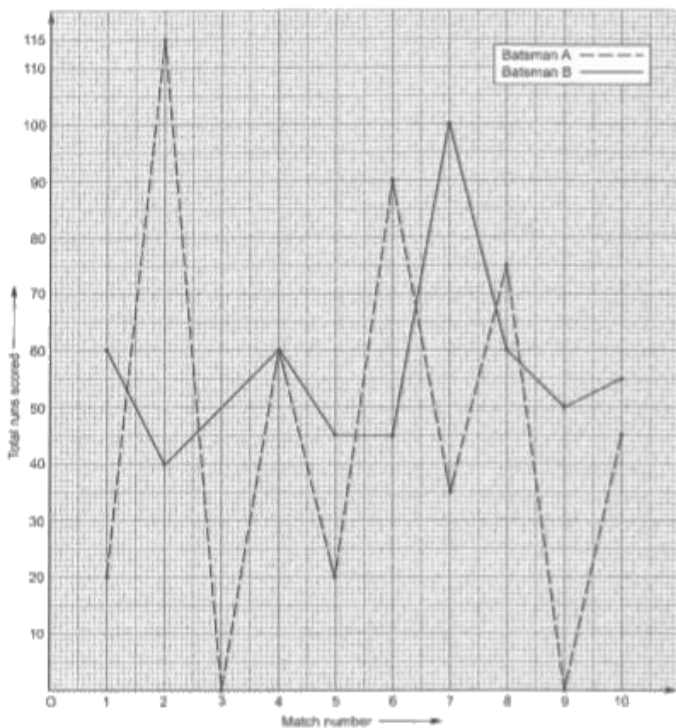
(*i*) What information is given on the two axes in the given graph ?

(*ii*) In which two matches did batsman B score the same number of runs ?

(*iii*) Were the runds scored by the two batsmen same in any of the matches ? If so , in

which match?

(iv) Among the two batsmen, who is steadier ? How do you judge it ?

9. Interest on deposits for a year.

(i) Does the graph pass through the origin?

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

(iii) To get an interest of rupes 280 per year,

how much money should be deposited?

Deposit (in ₹)	1000	2000	3000	4000	5000
Cost in (₹)	80	160	240	320	400

10. Plot a line graph for the variables x and y, where y is three times x, i.e. the equation is $y = 3x$.

Using the graph, find the value of

$(i) y$, when $x = 5$ $(ii) x$, when $y = 18$

11. The following is the conversion graph of temperature in $^\circ C$ and $^\circ F$.

Use the graph to answer the questions given below :

(i) Convert $140^\circ F$ to $^\circ C$.

(ii) Convert $20^\circ C$ to $^\circ F$.

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Exercise 23

1. The following table depicts the maximum temperature on the seven days of a particular week. Study the table and draw a line graph for the same.

Day	Sun	Mon	Tues	Wed	Thurs	Fri	Sat
Maximum temp. (in °C)	25	28	26	32	29	34	31

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2. Consider the following input/output table. Draw a line graph for it.

Input	1	2	4	5	7
Output	2	5	11	14	20

Now, use the graph drawn to predict the outputs for the inputs of 3 and 8.

3. The table given below depicts the annual gross profit of a company for a period of 5 years . Study the table and draw a line graph for the same .

Year	2013	2014	2015	2016	2017
Gross profit (in lakhs of ₹)	17	15.5	11.4	12.1	14.9

4. Ajita starts off from home at 07.00 hours with her father on a scooter that goes at a uniform speed of 30 km/h and drops her at her school after half an hour. She stays in the school till 13.30 hours and takes an auto rickshaw to return home. The rickshaw has a uniform speed of 10 km/h. Draw the graph for the above situation and also determine the distance of Ajita's school from her house.

5. The following table shows the percentage of students who dropped out of school after completing high school.

Year	2005	2007	2009	2011	2013	2015	2017
Percentage of students who dropped out of school	6%	5.5%	5%	4.7%	4.9%	4%	4.5%

Study the above table carefully and draw a line graph to depict it.

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6. 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.

(a) In which year both the boys and the girls achieve their maximum height?

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

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7. A car is travelling from city P to city Q which are 350 km apart. The line graph given below describes the distances of the car from the city P at different times .
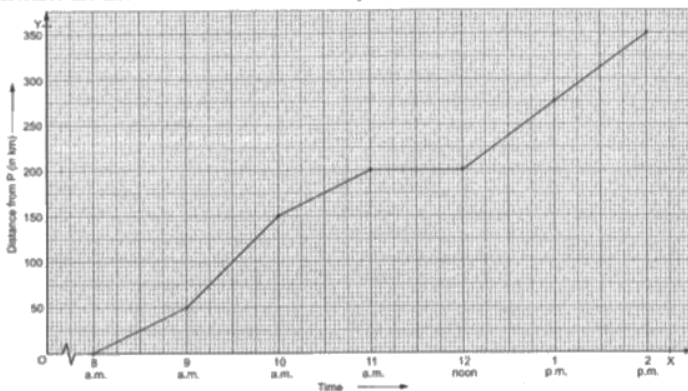
Study the above graph and answer the questions given below.

(i) What information is given on the two axes ?

(ii) From where and when did the car begin its journey ?

(iii) How far did the car go in the first hour ?

(iv) How far did the car go during (a) the $2nd$ hour and (b) the $3rd$ hour?

(v) Was the speed same during first three hours? How do you know it ?

(vi) Did the car stop for some duration at any place ? Justify your answer.

(vii) When did the car reach city Q ?

8. A courter-person cycles from a town to a neighbouring suburban area to deliver a parcel to a merchant. His distances from the twon at different times are shown by the given graph.
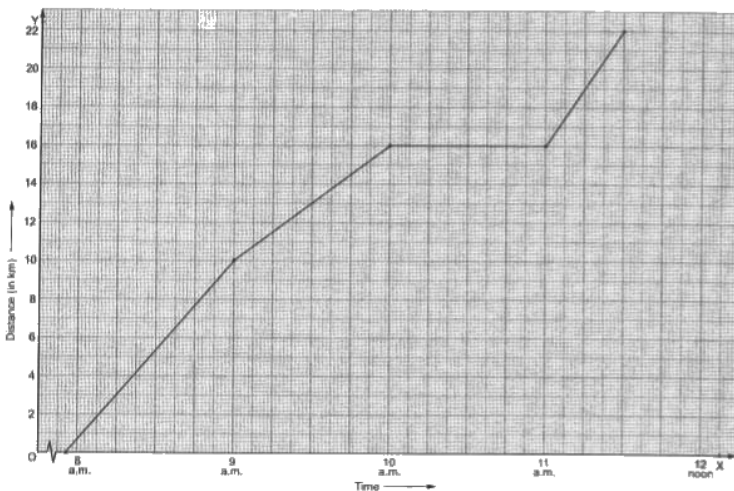
Study the above graph carefully and answer the questions given below:

(*i*) What is the scale taken for the time-axis?

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

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

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

(v) During which period did he ride fastest ?

9. A man started his journey on his car from location A and came back. The graph given below shows his position at different times

during the whole journey.
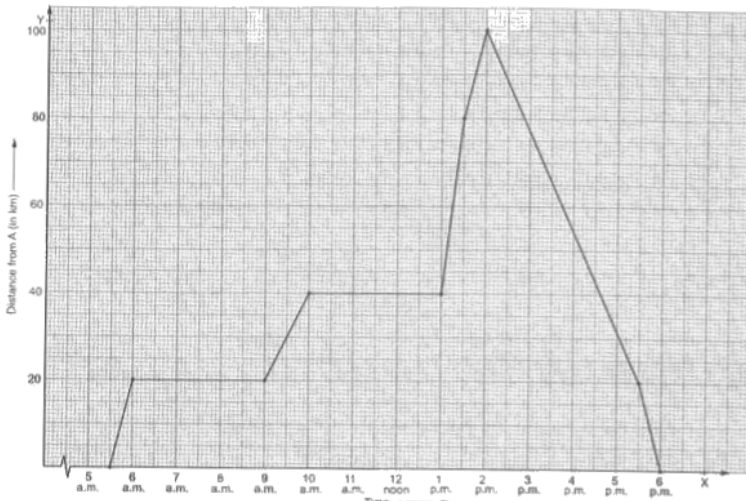
Study the above graph carefully and answer the questions that follow:

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

(*ii*) What was the total duration of the journey ?

(*iii*) Which journey, onward 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 ?

10. The line graph given below shows the yearly sales figures for a manufacturing company during the last five years.
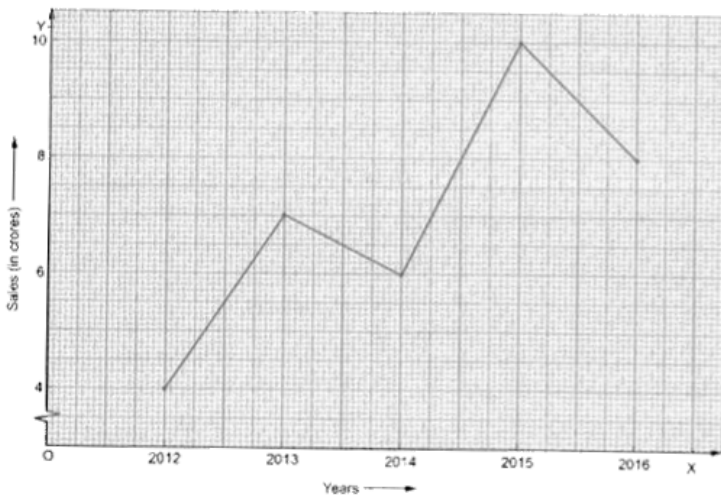
Study the above graph carefully and answer the questions given below :

(*i*) What are the sales in (*a*)2013 (*b*)2015 (*c*)2016 ?

(*ii*) Compute the difference between the sales in 2012 and 2016 ?

(*iii*) In which year was there the greatest

difference between the sales as compared to its previous year?

11. The following is the distance -time graph of Amit's walking.
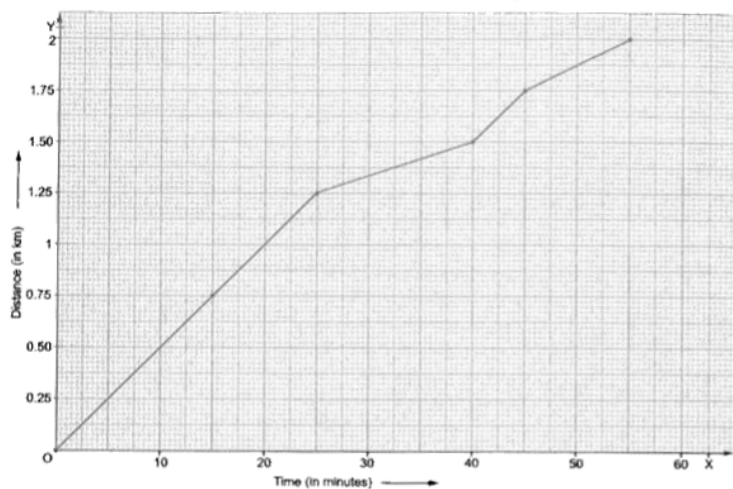
Study the above graph carefully and answer

the questions given below :

(*i*) When does Amit make the least progress ?

Explain your answer.

(*ii*) Find his average speed in km/hr.

12. For an experiment in botany, two different plants, plant A and B, were grown under similar laboratory conditions. Their heights were measured at the end of each week for three weeks. The results are shown by the line

graph given below :
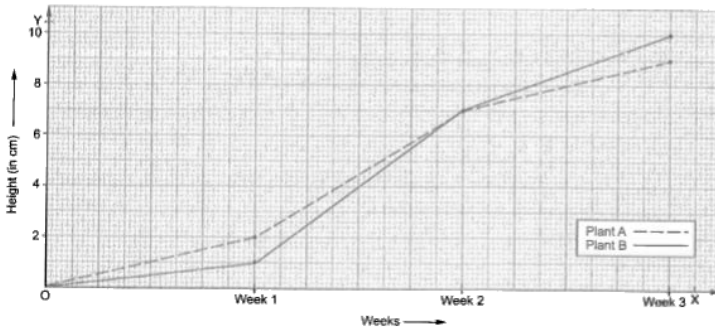
Study the above line graph carefully and answer the questions given below:

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

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

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

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

(v) During which week did plant A grow most ?

(vi) During which week did plant B grow least ?

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

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13. The following line graph shows the change in temperature of a block of ice when heated.
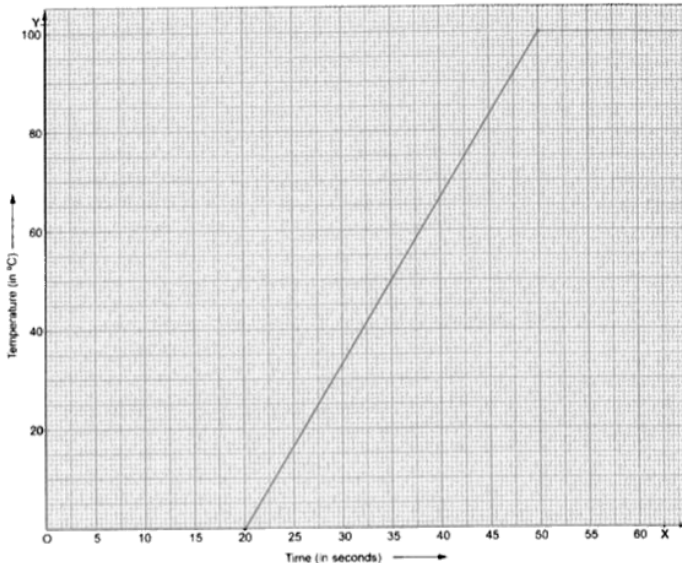
Study the above graph carefully and answer the questions given below :

(i) For how many seconds did the ice block have no change in temperature?

(ii) For how long was there a change in

temperature?

(iii) After how many seconds of heating did the temperature become constant at $100°C$?

(iv) What was the temperature after 25 seconds?

(v) What will be the temperature after 1.5 minutes ? Justify your answer.

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14. The following line graph shows the temperature   forecast   and   the   actual

temperature for each day of a week.
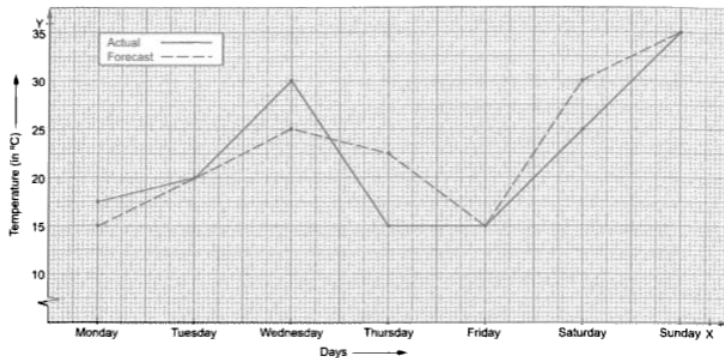
Study the above double line graph carefully

and answer the questions given below:

(*i*) On which days was the forecast

temperature the same as the actual

temperature?

(*ii*) What was the maximum forecast

temperature during the week ?

(*iv*) On which day did the actual temperature

differ the most from the forecast temperature?

15. The following distance-time graph is for a car travelling to certain places.
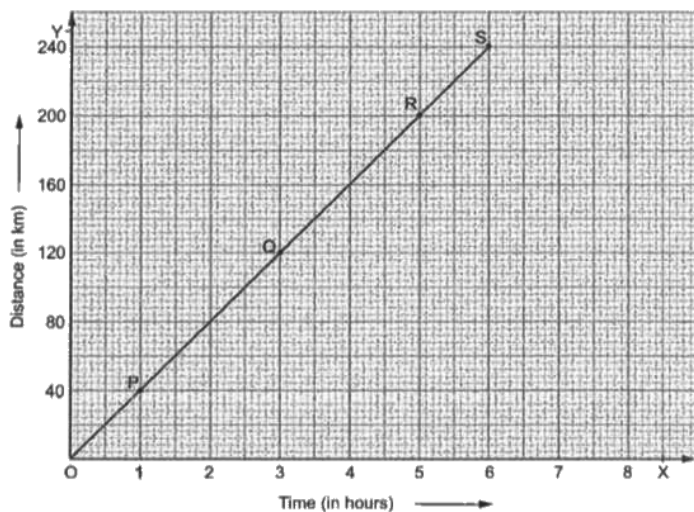
Study the above distance-time graph carefully and answer the questions given below :

(i) How far does the car travel in $4\dfrac{1}{2}$ hours ?

(ii) Hou much time does the car take to reach R ?

(iii) How long does the car take to cover $80km$?

(iv) How far is Q from the starting point ?

(v) When does the car reach the place S after starting ?

16. The following line graph shows the journey made by two cyclists, cyclist I and cyclist II, one from town B to town A and the other from town A to town B.
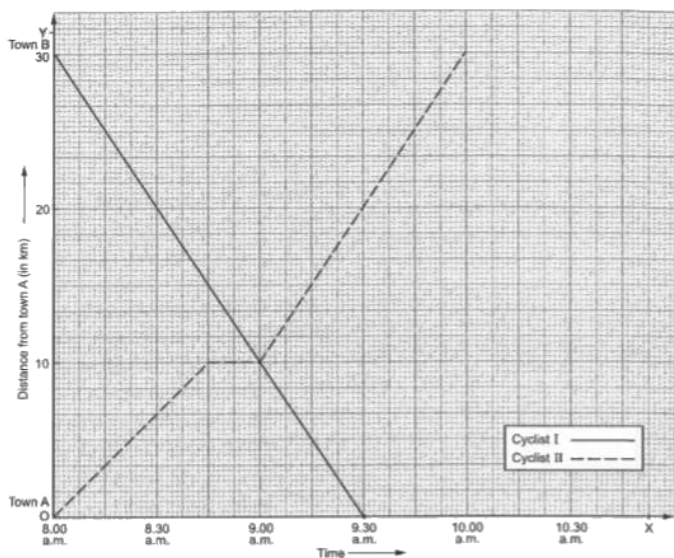
Study the above graph carefully and answer the questions given below :

(i) At what time did cyclist II rest ? For how

long did the cyclist rest ?

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

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

(iv) How far had cyclist II travelled when he met cyclist I ?

When cyclist II reached twon B, how far was cylist I from town A ?

17. The following table gives the distances travelled by a car at various time- intervals . Study the table and draw a linear graph for the same.

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

From your graph, answer the questions given below:

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

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

(iii) How much distance had the car covered by 8.30 a.m. ?

18. Study the table given below and draw a line graph for it.

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

Is the graph drawn, a linear graph ?

19. Study the table given below and draw a line graph for it.

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

Is the graph drawn, a linear graph ?

20. Plot a line graph for the variables p and q, where p is four times q i.e., the equation is $p = 4q$.

Using the graph, find the value of $(i)p$, when $q = 6$ and $(ii)q$ when $p = 20$.

21. Plot a line graph for the variables x and y, where $y = 2x + 1$.

Further, find the value of (i) y when $x = 5$ and

(ii) x when $y = 13$

22. (Principal and Simple Interest) A bank gives 10% Simple Interest (S.I.) 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 obt
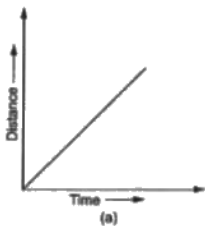
23. (Time and Distance) Ajit can ride a scooter constantly at a speed of 30 kms/hour. Draw a

time-distance graph for this situation. Use it

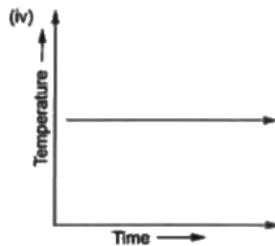to find (i) the time taken by Ajit to ride 75 km.
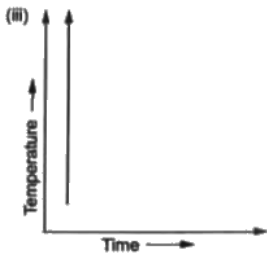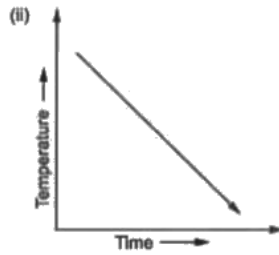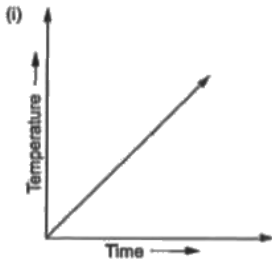
(ii) the distance covered by Ajit in

24. Explain the situations represented by the

following distance-time graphs :
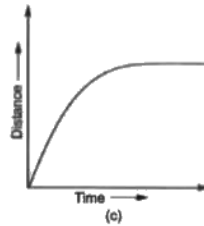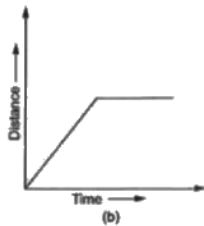
25. Can there be a temperature- time graph as follows ? Justify your answer.