



MATHS

BOOKS - NCERT EXEMPLAR

INTRODUCTION TO GRAPHS

Solved Examples

1. Every point on the x axis is of the form.

A. (0, y)

B. (x, 0)

 $\mathsf{C}.\left(x,y\right)$

D. (x, 1)

Answer: B

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2. 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

Answer: C

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3. In a _____ graph, all the points on the

graph lie on the same straight line.



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6. State True or False : The y coordinate of any

point lying on the x axis will be 0.

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



8. Write the coordinates of all the points in

the given graph.



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9. The following is a conversion graph of temperature in $^{\circ}C$ and $^{\circ}F$. Use the graph to answer the following questions.

(a0 Convert $140\,^\circ F$ to $\,^\circ C.$

(b) Convert $20\,^\circ C$ to $\,^\circ F$



10. Following graph shows a comparison of the approximate sale of items manufactured by a company for the first two years of its operation.

(a) In which months there was maximumdifference in the sale of items of two years?(b) In which year was there more stability inthe sale of items ?(c) In which month the sale remains the same

in both the years ?

(d) In which month was the sales of first year

less than that of second year?





11. The given graphs show the progress of two different cyclists during a ride. For each graph, describe the rider's progress over the period

of time.



12. A double bar graph is useful for the ______ of two sets of data.
Data represented in a circular form is called a ______ chart.

The graph of a linear equation is always a

___ line.

The cartesian system used two axes which are

to each other.

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Think And Discuss

1. Draw the graph of the linear equation y=mx+c for $m=rac{1}{2}$ and $C=rac{3}{2}$ Read

from the graph, the value of x when y =4.5.

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2. How would the graph change when the equation changes to y = 3x from y=x ?



3. Give the coordinates of a point on the x-axis

and a point on the y-axis.



Give the missing y-coordinates for the solutionsto

y=5x+2,(1,y),(3,y),(10,y).

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1. Comparison of parts of a whole may be done

by a

A. bar graph

B. pie chart

C. linear graph

D. line graph

Answer: B

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2. A graph that displays data that changes continuously over periods of time is

A. bar graph

B. pie chart

C. histogram

D. line graph

Answer: D

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3. In the given graph the coordinates of point

x are



A. (0, 2)

- B.(2,3)
- C.(3,2)

D. (3, 0)





4. In the given graph the letter that indicates the point (0, 3) is



A. P

B.Q

C. R

D. S

Answer:



- 5. The point (3, 4) is at a distance of
 - A. 3 from both the axis
 - B. 4 from both the axis
 - C. 4 from the x axis
 - D. 3 from x axis

Answer: C







7. The coordinates of a point at a distance of 3 units from the x axis and 6 units from the y axis is

A. (0, 3) B. (6, 0) C. (3, 6) D. (6, 3)

Answer:





8. 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)

Answer:

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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 30 seconds?



A. 20

B. 34

C. 28

D. 34





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





11. _____ displays data that changes

continuously over periods of time.





12. The relation between dependent and independent variables is shown through a Watch Video Solution coordinates for 13. We need representing a point on the graph sheet. Watch Video Solution

14. A point in which the x-coordinate is zero and y-coordinate is non zero will lie on the



15. The horizontal and vertical line in a line

graph are usually called _____ and



•

16. The process of fixing a point with the help of the coordinates is known as _____ of the point.



17. The distance of any point from the y-axis is

the _____ coordinate.



18. All points with y-coordinate as zero lie on
the
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19. For the point (5, 2), the distance from the x-
axis is units.
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20. The x-coordinate of any point lying on the y-axis will be _____. Watch Video Solution **21.** The y-coordinate of the point (2, 4) is •____• Watch Video Solution

22. In the point (4, 7), 4 denotes the _____



23. A point has 5 as its x-coordinate and 4 as

its y-coordinate. Then the coordinates of the

point are given by _____.

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24. In the coordinates of a point, the second

number denotes the _____.

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25. The point where the two axes intersect is

called the _____.

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26. For fixing a point on the graph sheet we need two coordinates.

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27. State True or False

A line graph can also be a whole unbroken

line.



28. The distance of any point from the x-axis is

called the x-coordinate.



29. The distance of the point (3, 5) from the y-

axis is 5.

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30. State True or False

The ordinate of a point is its distance from the

y-axis.

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33. The points (3, 5) and (5, 3) represent the same point.


34. The y-coordinate of any point lying on the

x-axis will be zero.

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35. Match the coordinates given in Column A

with the items mentioned in Column B.

Column A		Column B			
(1)	(0, 5)	(a)	y coordinate is $2\times x$ - coordinate + 1.		
(2)	(2, 3)	(b)	Coordinates of origin.		
(3)	(4, 8)	(c)	Only y-coordinate is zero.		
(4)	(3, 7)	(d)	The distance from x -axis is 5.		
(5)	(0, 0)	(e)	y coordinate is double of x -coordinate.		
(6)	(5, 0)	(1)	The distance from y -axis is 2.		

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36. Match the ordinates of the points given in

Column A with the items mentioned in Column

Β.

Column A			Column B			
(a)	(7, 0)	(1)	The ordinate is double the abscissa.			
(b)	(11, 11)	(11)	The ordinate is zero.			
(c)	(4, 8)	(111)	The ordinate is equal to the abscissa.			
(d)	(6, 2)	(IV)	The abscissa is double the ordinate.			
(e)	(0, 9)	(v)	The abscissa is triple the ordinate.			
(1)	(6, 3)	(vi)	The abscissa is zero.			



37. From the given graph, choose the letters that indicate the location of the points given below.



A. (2, 0)

- B.(0,4)
- C.(2, 6)
- D. (3, 3)

Answer:



38. Find the coordinates of all letters in the graph given below.





39. Plot the given points on a graph sheet.

- (i) (5,4)
- (ii) (2,0)
- (iii) (3,1)

(iv) (0,4)

(v) (4,5)

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40. Study the given map of a zoo and answer

the following questions.



- A. Give the location of lions in the zoo.
- B. (D, f) and (C, d) represent locations of

which animals in the zoo?

- C. Where are the toilets located?
- D. Give the location of canteen.

Answer:



41. Write the x-coordinate (abscissa) of each of

the given points.

(a) (7,3)

(b) (5,7)

(c) (0,5)

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42. Write the y-coordinate (ordinate) of each

of the given points.

(a) (3,5)

(b) (4,0)

(c) (2,7)

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43. Plot the given points on a graph sheet and check if the points lie on a straight line. If not, name the shape they form when joined in the

given order.

(a) (1, 2), (2, 4), (3, 6), (4, 8).

(b) (1, 1), (1, 2), (2, 1), (2, 2).

(c) (4, 2), (2, 4), (3, 3), (5, 4).

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44. If y-coordinate is 3 times x-coordinate,

form a table for it and draw a graph.

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45. Make a line graph for the area of a square

as per the given table.

Side (in cm)	1	2	3	4
Area (in cm²)	1	4	9	16

Is it a linear graph?

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46. The cost of a note book is Rs 10. Draw a graph after making a table showing cost of 2, 3, 4, note books. Use it to find

(a) the cost of 7 notebooks.

(b) The number of note books that can be

purchased with Rs 50.



47. Explain the situations represented by the

following distance-time graphs.





48. Complete the given tables and draw a graph for each.



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49. Study the given graphs (a) and (b) and complete the corresponding tables below.





50. 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,

a) Find the circumference of the circle when

radius is 42 units.

(b) At what radius will the circumference of

the circle be 220 units?

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51. The graph shows the maximum temperatures recorded for two consecutive weeks 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°C for

the first week?

(g) On which day was the temperature highest

for the second week?

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52. The graph given below gives the actual and expected sales of cars of a company for 6 months. Study the graph and answer the questions that follow.



(a) In which month was the actual sales same as the expected sales?

(b) For which month(s) was (were) the difference in actual and expected sales the maximum?

(c) For which month(s) was (were) the difference in actual and expected sales the least?

(d) What was the total sales of cars in the

months-Jan, Feb. and March?

(e) What is the average sales of cars in the last

three months?

(f) Find the ratio of sales in the first three

months to the last three months.

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53. The graph given below shows the marks obtained out of 10 by Sonia in two different tests. Study the graph and answer the questions that follow.



(a) What information is represented by the axes?

(b) In which subject did she score the highest in Test I?

(c) In which subject did she score the least in Test II?

(d) In which subject did she score the same marks in both the Tests?

(e) What are the marks scored by her in English in Test II?
(f) In which test was the performance better?
(g) In which subject and which test did she score full marks?

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



55. Study the graph given below of a person who started from his home and returned at

the end of the day. Answer the questions that

follow.



(a) At what time did the person start from his home?

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

- (c) What was he doing from 3 pm to 5 pm?
- (d) What was the total distance travelled by him throughout the day ?
- (e) Calculate the distance covered by him in the first 8 hours of his journey.
- (f) At what time did he cover 16 km of his journey?
- (g) Calculate the average speed of the man
- from (a) A to B (b) B to C (c) (h)At what time
- did he return home?



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

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57. Study the graph and answer the questions 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 $31^{\,\circ}C?$

(d) Which was the hottest day?



58. 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 hours?

(b) How much time does the car take to reach

R?

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

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

(e) When does the car reach the place S after

starting?



59. 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.



60. 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.



61. Locate the points P (3,4), Q (1,0), R (0,4), S

(4,1) on a graph sheet.



62. The graph given below compares the sales

of ice creams of two vendors for a week.



Observe the graph and answer the following questions.

(a) Which vendor has sold more icecreams on Friday?

(b) For which day was the sales same for both

the vendors?

(c) On which day did the sale of vendor A increase the most as compared to the

previous day?

(d) On which day was the difference in sales

the maximum?

(e) On which two days was the sales same for

vendor B?

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63. The table given below shows the temperatures recorded on a day at different times.



Observe the table and answer the following questions.

(a) What is the temperature at 8 am?

(b) At what time is the temperature $3^{\circ}C$?

(c) During which hour did the temperature

fall?

(d) What is the change in temperaturebetween 7 am and 10 am?(e) During which hour was there a constant

temperature?



64. 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 of 5 years?

(b) How much taller was the child at the age of

10 than at the age of 6?

(c) Between which two consecutive periods did

the child grow more faster ?

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65. The following is the time-distance graph of Sneha's walking.



(a) When does Sneha make the least progress?

Explain your reasoning.

(b) Find her average speed in km/hour.


66. 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)		Point	(0.5x, 0.5y)	Point	(2 <i>x</i> , 1.5 <i>y</i>)
Α	(1, 1)		Е	(0.5, 0.5)	J	(2, 1.5)
В	(4.4)		F		К	
с	(8, 4)		G		L	
D	(5, 1)		Н		М	
Table I		-	Т	able II	Т	able III

Draw parallelograms EFGH and JKLM on the

same graph paper. Plot the points (2, 4) and (4,

2) on a graph paper, then draw a line segment

joining these two points.

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67. 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.

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68. The following graph shows the change in temperature of a block of ice when heated. Use the graph to answer the following questions:

(a) For how many seconds did the ice block have no change in temperature? (b) For how long was there a change in temperature? (c) After how many seconds of heating did the temperature become constant at $0^{\circ}C$? (d) What was the temperature after 25 seconds? (e) What will be the temperature after 1.5

minutes? Justify your answer.



69. The following graph shows the number of people present at a certain shop at different times. Observe the graph and answer the following questions.



- (a) What type of a graph is this?
- (b) What information does the graph give?
- (c) What is the busiest time of day at the shop?
- (d) How many people enter the shop when it opens?
- (e) About how many people are there in the

shop at 1:30 pm?



70. 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.

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

(b) What was the total duration of journey?

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

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

(e) At what time did he have the fastest

speed?





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

(a) At what time did cyclist II rest? How long

did the cyclist rest?

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

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

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

(e) When cyclist II reached town A, how far was

cyclist I from town B?



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72. 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.



73. Draw the line graph using suitable scale to show the annual gross profit of a company for

a period of five years.

Year	Ist	2nd	3rd	4th	5th
Gross Profit	17,00,000	15,50,000	11,40,000	12,10,000	14,90,000
(in Rs)					



74. 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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75. The table shows the data collected for

Dhruv'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

(a) Plot a line graph for the given data using a suitable scale.

(b) In what time periods did Dhruv make the

most progress?



76. Observe the given graph carefully and complete the table given below.



77. This graph shows the per cent of students who dropped out of school after completing High School. The point labelled A shows that, in 1996, about 4.7% of students dropped out.



(a) In which year was the dropout the rate highest? In which year was it the lowest? (b) When did the per cent of students who dropped out of high school first fall below 5%? (c) About what per cent of students dropped out of high school in 2007? About what per cent of students stayed in high school in 2008?



Watch Video Solution **78.** Observe the toothpick pattern given below: Pattern 1 Pattern 3 Pattern 4 (a) Imagine that this pattern continues. Complete the table to show the number of

toothpicks in the first six terms.

Pattern	1	2	3	4	5	-6
Toothpicks	4			13		

(b) Make a graph by taking the pattern numbers on the horizontal axis and the number of toothpicks on the vertical axis. Make the horizontal axis from 0 to 10 and the vertical axis from 0 to 30.

(c) Use your graph to predict the number of toothpicks in patterns 7 and 8. Check your answers by actually drawing them.

(d) Would it make sense to join the points on

this graph? Explain.



79. Consider this input/output table.

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

(a) Graph the values from the table by takingInput along horizontal axis from 0 to 8 andOutput along vertical axis from 0 to 24.(b) Use your graph to predict the outputs forinputs of 3 and 8.



80. This graph shows a map of an island just off the coast of a continent. The point labelled B represents a major city on the coast. The distance between grid lines represents 1 km.



Point A represents a resort that is located 5 km East and 3 km North of Point B. The values 5 and 3 are the coordinates of Point A. The coordinates can be given as the ordered pair (5, 3), where 5 is the horizontal coordinate and 3 is the vertical coordinate. (i) On a copy of the map, mark the point that is 3 km East and 5 km North of Point B and label it S. Is Point S in the water or on the island? Is Point S in the same place as Point A? (ii) Mark the point that is 7 km east and 5 km north of Point B and label it C. Then mark the point that is 5 km east and 7 km north of Point B and label it D. Are Points C and D in the same place? Give the coordinates of Points C and D.

(iii) Which point is in the water, (2, 7) or (7, 2)? Mark the point which is in water on your map and label it E. (iv) Give the coordinates of two points on the island that are exactly 2 km from Point A. (v) Give the coordinates of the point that is halfway between Points L and P. (vi) List three points on the island with their xcoordinates greater than 8. (vii) List three points on the island with a ycoordinate less than 4.

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81. As part of his science project, Prithvi was supposed to record the temperature every hour one Saturday from 6 am to midnight. At noon, he was taking lunch and forgot to record the temperature. At 8:00 pm, his favourite show came on and so forgot again. He recorded the data so collected on a graph sheet as shown below.



(a) Why does it make sense to connect the points in this situation?

(b) Describe the overall trend, or pattern, in

the way the temperature changes over the

time period shown on the graph.

(c) Estimate the temperature at noon and 8

pm.



82. The graph given below compares the price (in Rs) and weight of 6 bags (in kg) of sugar of different brands A, B, C, D, E, F.



(a) Which brand(s) costs/cost more than Brand D?

(b) Bag of which brand of sugar is the heaviest?

(c) Which brands weigh the same?

(d) Which brands are heavier than brand B?

(e) Which bag is the lightest?

(f) Which bags are of the same price?

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



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

(b) Which point represents each animals?

Explain.



84. The two graphs below compare Car A and Car B. The left graph shows the relationship between age and value. The right graph shows the relationship between size and maximum speed.



Use the graphs to determine whether each statement is true or false, and explain your answer.

- (a) The older car is less valuable.
- (b) The faster car is larger.
- (c) The larger car is older.
- (d) The faster car is older.
- (e) The more valuable car is slower.



85. Sonal and Anmol made a sequence of tile designs from square white tiles surrounding one square purple tile. The purple tiles come in many sizes. Three of the designs are shown below.

(a) Copy and complete the table



(b) Draw a graph using the first five pairs of

numbers in your table.

(c) Do the points lie on a line?



86. Sonal and Anmol then made another sequence of the designs. Three of the designs are shown below.



(a) Complete the table.

	- V		
Rows, r	4	6	8
Number of white Tiles, w	9		
Number of Purple Tiles, p			

(b) 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.

(c) Which graph is linear?

