पु•ना International School

Shree Swaminarayan Gurukul, Zundal

Class – VII

Sub – Maths

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INDEX

NCERT Solutions for Class 7 Maths Chapter 3

Data Handling Class 7

Chapter 3 Data Handling Exercise 3.1, 3.2, 3.3, 3.4 Solutions

Exercise 3.1 : Solutions of Questions on Page Number : **62**

Q1 :

Find the range of heights of any ten students of your class.

Answer :

Let the heights (in cm) of 10 students of our class be

125, 127, 132, 133, 134, 136,138, 141, 144, 146

Highest value among these observations = 146

Lowest value among these observations = 125

Range = Highest value - Lowest value

= (146 - 125) cm

= 21 cm

Q2 :

Organise the following marks in a class assessment, in a tabular form.

4, 6, 7, 5, 3, 5, 4, 5, 2, 6, 2, 5, 1, 9, 6, 5, 8, 4, 6, 7 (i)

Which number is the highest?

(ii) Which number is the lowest?

(iii) What is the range of the data?

(iv) Find the arithmetic mean.

Answer :

Marks	Tally marks	Frequency
1	|	1
2	||	2
3	|	1
4	|||	3
5	𝍸	5
6	𝍸|	4

7	||	2
8	|	1
9	|	1

(i) Highest number = 9 (ii)

Lowest number = 1

(iii) Range = (9 - 1) = 8

(iv) Sum of all the observations = 4 + 6 + 7 + 5 + 3 + 5 + 4 + 5 + 2 + 6 +2

+ 5 + 1 + 9 + 6 + 5 + 8 + 4 + 6 + 7

= 100

Total number of observations = 20

$$\text{Arithmetic mean} = \frac{\text{Sum of all the observations}}{\text{Total number of the observations}} = \frac{100}{20} = 5$$

Q3 :

Find the mean of the first five whole numbers.

Answer :

First five whole numbers are 0, 1, 2, 3, and 4.

Mean = $\frac{0+1+2+3+4}{5} = \frac{10}{5} = 2$

Therefore, the mean of first five whole numbers is 2.

Q4 :

A cricketer scores the following runs in eight innings:

58, 76, 40, 35, 46, 45, 0, 100

Find the mean score.

Answer :

Runs scored by the cricketer are 58, 76, 40, 35, 46, 45, 0, and 100.

$$\text{Mean score} = \frac{\text{Total runs scored in all the innings}}{\text{Total number of the innings}}$$

Mean score = $\frac{58+76+40+35+46+45+0+100}{8} = \frac{400}{8} = 50$

Therefore, mean score is 50.

Player	Game 1	Game 2	Game 3	Game 4
A	14	16	10	10
B	0	8	6	4
C	8	11	Did not play	13

Now answer the following questions:

(i) Find the mean to determine A's average number of points scored per game.
(ii) To find the mean number of points per game for C, would you divide the total points by 3 or by 4? Why?

Q5 :

Following table shows the points of each player scored in four games:
(iii) B played in all the four games. How would you find the mean?

(iv) Who is the best performer?

Answer :

(i) A's average number of points = $\frac{14+16+10+10}{4}$

$= \frac{50}{4} = 12.5$

(ii) To find the mean number of points per game for C, we will divide the total points by 3 because C played 3 games.

(iii) Mean of B's score = $\frac{0+8+6+4}{4} = \frac{18}{4} = 4.5$

(iv) The best performer will have the greatest average among all. Now we can observe that the average of A is 12.5 which is more than that of B and C. Therefore, A is the best performer among these three.

Q6 :

The marks (out of 100) obtained by a group of students in a science test are 85, 76, 90, 85, 39, 48, 56, 95, 81 and 75. Find the:

(i) Highest and the lowest marks obtained by the students.

(ii) Range of the marks obtained.

(iii) Mean marks obtained by the group.

Answer :

The marks obtained by the group of students in a science test can be arranged in an ascending order as follows.

39, 48, 56, 75, 76, 81, 85, 85, 90, 95

(i) Highest marks = 95

Lowest marks = 39

(ii) Range = 95 - 39

Q7 :

The enrolment in a school during six consecutive years was as follow:

1555, 1670, 1750, 2013, 2540, 2820

Find the mean enrolment of the school for this period.

Answer :

Mean enrolment = $\frac{(1555+1670+1750+2013+2540+2820)}{6}$

$= \frac{12348}{6} = 2058$

Q8 :

The rainfall (in mm) in a city on 7 days of a certain week was recorded as follows:

Days	**Rain fall (in mm)**
Monday	0.0
Tuesday	12.2
Wednesday	2.1
Thursday	0.0
Friday	20.5
Saturday	5.5
Sunday	1.0

(i) Find the range of the rainfall in the above data.

(ii) Find the mean rainfall for the week.

(iii) On how many days was the rainfall less than the mean rainfall.

Answer :

(i) Range = (20.5 - 0.0) mm

= 56

(iii) Mean marks = $\frac{(85+76+90+85+39+48+56+95+81+75)}{10}$

$= \frac{730}{10} = 73$

= 20.5 mm

(ii) Mean rainfall = $\frac{(0.0+12.2+2.1+0.0+20.5+5.5+1.0)}{7}$

$= \frac{41.3}{7} = 5.9 \text{ mm}$

(iii) For 5 days (i.e., Monday, Wednesday, Thursday, Saturday, Sunday), the rainfall was less than the average rainfall.

Q9 :

The heights of 10 girls were measured in cm and the results are as follows:

135, 150, 139, 128, 151, 132, 146, 149, 143, 141

(i) What is the height of the tallest girl?

(ii) What is the height of the shortest girl?

(iii) What is the range of the data?

(iv) What is the mean height of the girls?

(v) How many girls have heights more than the mean height.

Answer :

Arranging the heights of 10 girls in an ascending order,

128, 132, 135, 139, 141, 143, 146, 149, 150, 151

(i) Height of the tallest girl = 151 cm

(ii)Height of the shortest girl = 128 cm (iii)

Range = (151 - 128) cm

= 23 cm

(iv) Mean height = $\frac{(135+150+139+128+151+132+146+149+143+141)}{10}$

$= \frac{1414}{10} = 141.4 \text{ cm}$

(v) The heights of 5 girls are greater than the mean height (i.e., 141.4 cm) and these heights are 143, 146, 149, 150, and 151 cm.

Exercise 3.2 : Solutions of Questions on Page Number : **68**

Q1 :

The scores in mathematics test (out of 25) of 15 students is as follows:

19, 25, 23, 20, 9, 20, 15, 10, 5, 16, 25, 20, 24, 12, 20

Find the mode and median of this data. Are they same?

Answer :

Scores of 15 students in mathematics test are

19, 25, 23, 20, 9, 20, 15, 10, 5, 16, 25, 20, 24, 12, 20

Arranging these scores in an ascending order,

5, 9, 10, 12, 15, 16, 19, 20, 20, 20, 20, 23, 24, 25, 25

Mode of a given data is that value of observation which occurs for the most number of times. Median of a given data is the middle observation when the data is arranged in an ascending or descending order.

As there are 15 terms in the given data, therefore, the median of this data will be the 8th observation.

Hence, median = 20

Also, it can be observed that 20 occurs 4 times (i.e., maximum number of times).

Therefore, mode of this data = 20 Yes, both
are same.

Q2 :

The run scored in a cricket match by 11 players is as follows:

6, 15, 120, 50, 100, 80, 10, 15, 8, 10, 15

Find the mean, mode and median of this data. Are the three same?

Answer :

The runs scored by 11 players are

6, 15, 120, 50, 100, 80, 10, 15, 8, 10, 15

Arranging these scores in an ascending order,
6, 8, 10, 10, 15, 15, 15, 50, 80, 100, 120

Mean = $\frac{6+8+10+10+15+15+15+50+80+100+120}{11}$

$= \frac{429}{11} = 39$

Mode of a given data is that value of observation which occurs for the most number of times and the median of the given data is the middle observation when the data is arranged in an ascending or descending order.

As there are 11 terms in the given data, therefore, the median of this data will be the 6th observation.

Median = 15

Also, it can be observed that 15 occurs 3 times (i.e., maximum number of times).

Therefore, mode of this data = 15
No, these three are not same.

Q3 :

The weights (in kg.) of 15 students of a class are: 38,

42, 35, 37, 45, 50, 32, 43, 43, 40, 36, 38, 43, 38, 47 (i) Find the mode and median of this data.

(ii) Is there more than one mode?

Answer :

The weights of 15 students are
38, 42, 35, 37, 45, 50, 32, 43, 43, 40, 36, 38, 43, 38, 47

Arranging these weights in ascending order,

32, 35, 36, 37, 38, 38, 38, 40, 42, 43, 43, 43, 45, 47, 50
(i)

Mode of a given data is that value of observation which occurs for the most number of times and the median of the given data is the middle observation when the data is arranged in an ascending or descending order.

As there are 15 terms in the given data, therefore, the median of this data will be the 8th observation.

Hence, median = 40

Also, it can be observed that 38 and 43 both occur 3 times (i.e., maximum number of times). Therefore, mode

of this data = 38 and 43

(ii)

Yes, there are 2 modes for the given data.

Q4 :

Find the mode and median of the data: 13, 16, 12, 14, 19, 12, 14, 13, 14

Answer :

The given data is

13, 16, 12, 14, 19, 12, 14, 13, 14

Arranging the given data in an ascending order,

12, 12, 13, 13, 14, 14, 14, 16, 19

Mode of a given data is that value of observation which occurs for the most number of times and the median of the given data is the middle observation when the data is arranged in an ascending or descending order.

As there are 9 terms in the given data, therefore, the median of this data will be the 5th observation.

Hence, median = 14

Also, it can be observed that 14 occurs 3 times (i.e., maximum number of times).
Therefore, mode of this data = 14

Q5 :

Tell whether the statement is true or false:

(i) The mode is always one of the numbers in a data.

(ii) The mean is one of the numbers in a data.

(iii) The median is always one of the numbers in a data.

(iv) The data 6, 4, 3, 8, 9, 12, 13, 9 has mean 9.

Answer :

(i) True

Mode of a given data is that value of observation which occurs for the most number of times. Therefore, it is one of the observations given in the data.

(ii) False
Mean may or may not be one of the numbers in the data.

(iii) True

The median of the given data is the middle observation when the data is arranged in an ascending or descending order.

(iv) False

The given data is 6, 4, 3, 8, 9, 12, 13, 9

$$\text{Mean} = \frac{6+4+3+8+9+12+13+9}{8} = \frac{64}{8} = 8$$

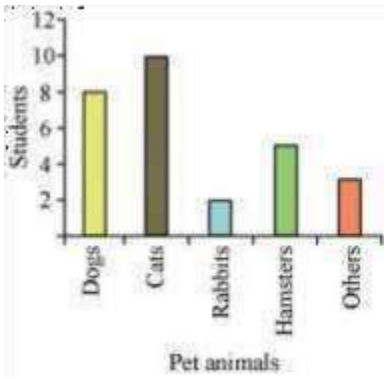
Exercise 3.3 : Solutions of Questions on Page Number : **72**

Q1 :

Use the bar graph (see the given figure) to answer the following questions.

(a) Which is the most popular pet?

(b) How many children have dog as a pet?



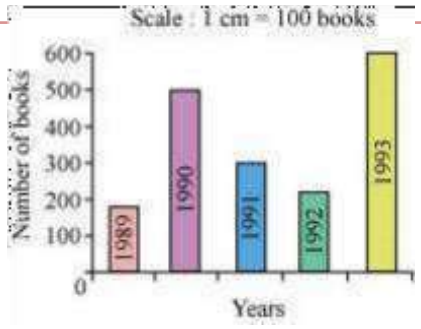
Answer :

(a) Since the bar representing cats is the tallest, cat is the most popular pet.

(b) The number of children having dog as a pet are 8.

Q2 :

Read the bar graph (see the given figure) which shows the number of books sold by a bookstore during five consecutive years and answer the questions that follow:



(i) About how many books were sold in 1989? 1990? 1992?
(ii) In which year were about 475 books sold? About 225 books sold?

(iii) In which years were fewer than 250 books sold?

(iv) Can you explain how you would estimate the number of books sold in 1989?

Answer :

(i) In 1989, 175 books were sold. In 1990, 475 books were sold. In 1992, 225 books were sold.

(ii) From the graph, it can be concluded that 475 books were sold in the year 1990 and 225 books were sold in the year 1992. (iii) From the graph, it can be concluded that in the years 1989 and 1992, the number of books sold were less than 250.

(iv) From the graph, it can be concluded that the number of books sold in the year 1989 is about 1 and $\frac{3}{4}$th part of 1 cm.
We know that the scale is taken as 1 cm = 100 books.

$100 + \frac{3}{4} \times 100 = 100 + 75 = 175$

Therefore, about 175 books were sold in the year 1989.

Q3 :

Number of children in six different classes are given below. Represent the data on a bar graph.

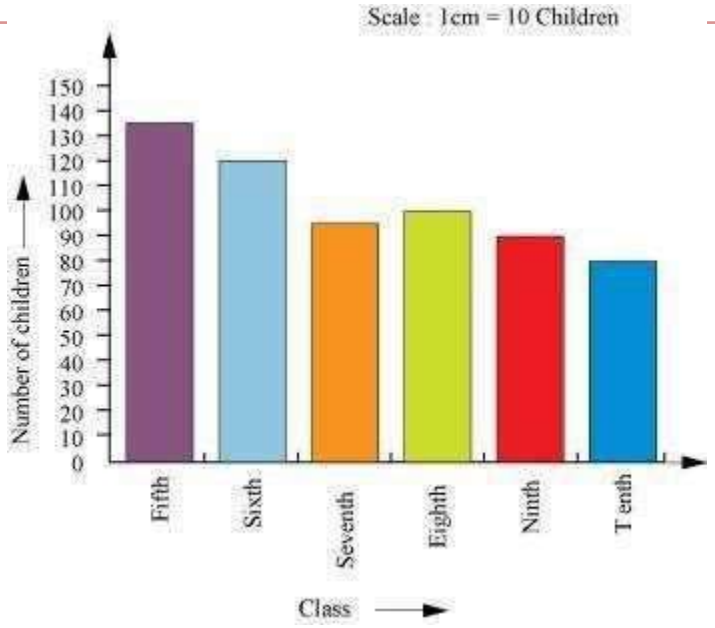
Class	Fifth	Sixth	Seventh	Eighth	Ninth	Tenth
Number of children	135	120	95	100	90	80

(a) How would you choose a scale?

(b) Answer the following questions:
(i) Which class has the maximum number of children? And the minimum?

(ii) Find the ratio of students of class sixth to the students of class eight.

Answer :



(a) We will choose a scale as 1 unit = 10 children because we can represent a more clear difference between the number of students of class 7th and that of class 9th by this scale.

(b)

(i) Since the bar representing the number of children for class fifth is the tallest, there are maximum number of children in class fifth. Similarly, since the bar representing the number of children for class tenth is the smallest, there are minimum number of children in class tenth.

(ii) The number of students in class sixth is 120 and the number of students in class eighth is 100. Therefore, the ratio between the number of students of class sixth and the number of students of class eighth $= \frac{120}{100} = \frac{6}{5} = 6:5$

Q4 :

The performance of students in 1st Term and 2nd Term is given. Draw a double bar graph choosing appropriate scale and answer the following:

Subject	English	Hindi	Moths	Science	S. science
1st Term (M.M. 100)	67	72	88	81	73
2nd Term (M.M. 100)	70	65	95	85	75

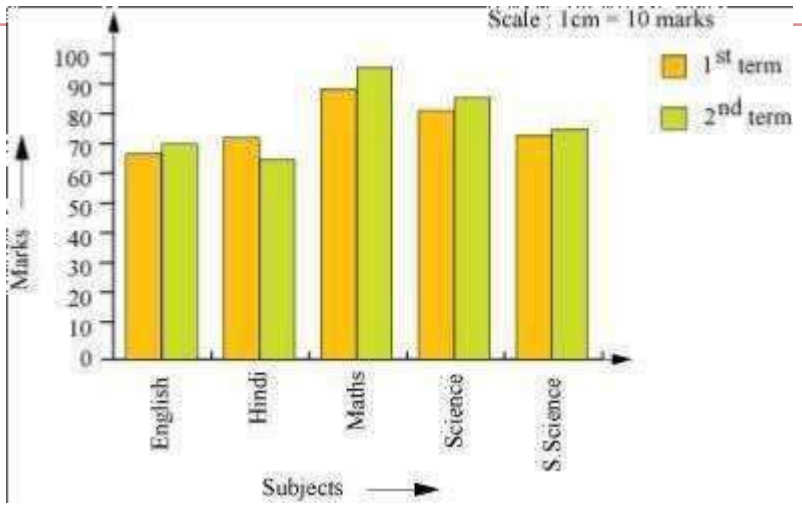
(i) In which subject, has the child improved his performance the most?

(ii) In which subject is the improvement the least?

(iii) Has the performance gone down in any subject?

Answer :

A double bar graph for the given data is as follows.



(i) There was a maximum increase in the marks obtained in Maths. Therefore, the child has improved his performance the most in Maths.

(ii) From the graph, it can be concluded that the improvement was the least in S. Science.

(iii) From the graph, it can be observed that the performance in Hindi has gone down.

Q5 :

Consider this data collected from a survey of a colony.

Favourite sport	Cricket	Basket Ball	Swimming	Hockey	Athletics
Watching	1240	470	510	430	250
Participating	620	320	320	250	105

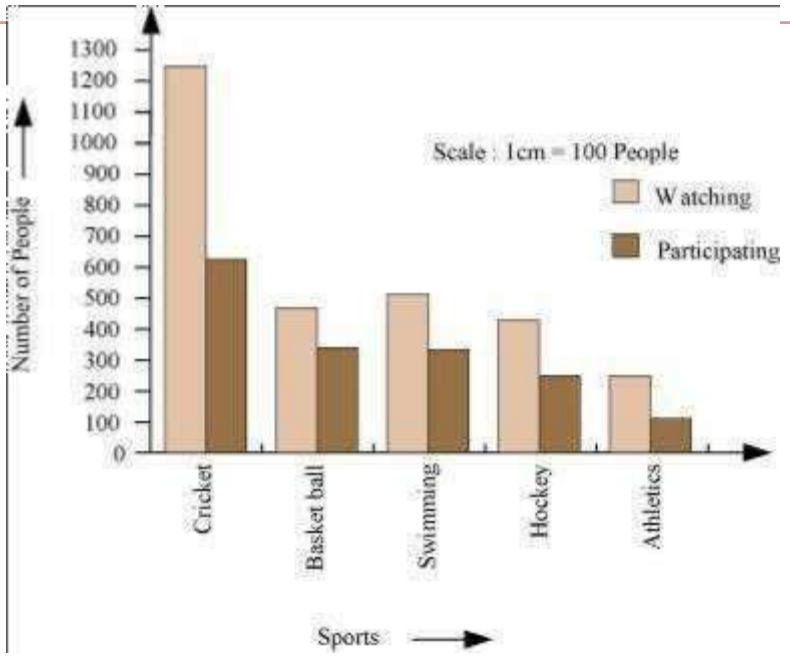
(i) Draw a double bar graph choosing an appropriate scale. What do you infer from the bar graph?

(ii) Which sport is most popular?

(iii) Which is more preferred, watching or participating in sports?

Answer :

(i) A double bar graph for the given data is as follows.



The double bar graph represents the number of people who like watching and participating in different sports. It can be observed that most of the people like watching and participating in cricket while the least number of people like watching and participating in athletics.

(ii) From the bar graph, it can be observed that the bar representing the number of people who like watching and participating in cricket is the tallest among all the bars. Hence, cricket is the most popular sport.

(iii) The bars representing watching sport are longer than the bars representing participating in sport. Hence, watching different types of sports is more preferred than participating in the sports.

Q6 :

Take the data giving the minimum and the maximum temperature of various cities given in the following table:

(i) Which city has the largest difference in the minimum and maximum temperature on the given date?

Temperatures of the cities as on 20.6.2006		
City	**Max.**	**Min.**
Ahmedabad	38 °C	29 °C
Amritsar	37 °C	26 °C
Banglore	28 °C	21 °C
Chennai	36 °C	27 °C
Delhi	38 °C	28 °C
Jaipur	39 °C	29 °C
Jammu	41 °C	26 °C
Mumbai	32 °C	27 °C

Plot a double bar graph using the data and answer the following:

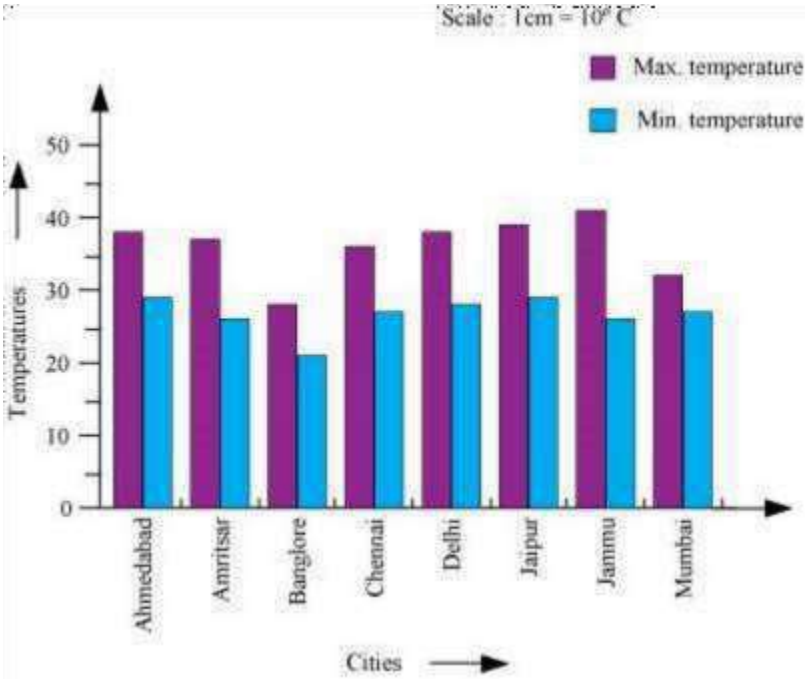
(ii) Which is the hottest city and which is the coldest city?

(iii) Name two cities where maximum temperature of one was less than the minimum temperature of the other.

(iv) Name the city which has the least difference between its minimum and the maximum temperature.

Answer :

A double bar graph for the given data is constructed as follows.



(i) From the graph, it can be concluded that Jammu has the largest difference in its minimum and maximum temperatures on
20.6.2006.

(ii) From the graph, it can be concluded that Jammu is the hottest city and Bangalore is the coldest city. (iii)

Bangalore and Jaipur, Bangalore and Ahmedabad

For Bangalore, the maximum temperature was 28ºC, while minimum temperature of both cities, Ahmedabad and Jaipur, was 29ºC.

(iv) From the graph, it can be concluded that the city which has the least difference between its minimum and maximum temperatures is Mumbai.

Exercise 3.4 : Solutions of Questions on Page Number : **76**

Q1 :

Tell whether the following is certain to happen, impossible, can happen but not certain.

(i) You are older today than yesterday.

(ii) A tossed coin will land heads up.

(iii) A die when tossed shall land up with 8 on top.

(iv) The next traffic light seen will be green.

(v) Tomorrow will be a cloudy day.

Answer :

(i) Certain

(ii) Can happen but not certain iii. Impossible as there are only six faces on a dice marked as 1, 2, 3, 4, 5, 6 on it.

(iv) Can happen but not certain

(v) Can happen but not certain

Q2 :

There are 6 marbles in a box with numbers from 1 to 6 marked on each of them.

(i) What is the probability of drawing a marble with number 2? (ii)

What is the probability of drawing a marble with number 5?

Answer :

(i) Probability = $\frac{\text{Number of favourable outcomes}}{\text{Number of possible outcomes}}$

P (appearance of 2) = $\frac{1}{6}$

(ii) P (appearance of 5) = $\frac{1}{6}$

Q3 :

A coin is flipped to decide which team starts the game. What is the probability that your team will start?

Answer :

A coin has two faces - Head and Tail. One team can opt either Head or Tail.

Probability = $\frac{\text{Number of favourable outcomes}}{\text{Number of possible outcomes}}$

Probability (our team starts first) = $\frac{1}{2}$

Q4 :

A box contains pairs of socks of two colours (black and white). I have picked out a white sock. I pick out one more with my eyes closed. What is the probability that it will make a pair?

Answer :

It can be observed that while closing the eyes, one can draw either a black sock or a white sock. Therefore, there are two possible cases.

Probability = $\frac{\text{Number of favourable outcomes}}{\text{Number of possible outcomes}}$

Probability (a pair of white socks will be formed) = $\frac{1}{2}$

NCERT Solutions for Class 7 Maths Chapter 4

Simple Equations Class 7

Chapter 4 Simple Equations Exercise 4.1, 4.2, 4.3, 4.4 Solutions

Exercise 4.1 : Solutions of Questions on Page Number : **81**

Q1 :

Complete the last column of the table.

S. No.	Equation	Value	Say, whether the equation is satisfied. (Yes/No)
(i)	$x + 3 = 0$	$x = 3$	-
(ii)	$x + 3 = 0$	$x = 0$	-
(iii)	$x + 3 = 0$	$x = -3$	-
(iv)	$x - 7 = 1$	$x = 7$	-
(v)	$x - 7 = 1$	$x = 8$	-
(vi)	$5x = 25$	$x = 0$	-
(vii)	$5x = 25$	$x = 5$	-
(viii)	$5x = 25$	$x = -5$	-
(ix)	$\frac{m}{3} = 2$	$m = -6$	-
(x)	$\frac{m}{3} = 2$	$m = 0$	-
(xi)	$\frac{m}{3} = 2$	$m = 6$	-

Answer :

(i) $x + 3 = 0$

L.H.S. = $x + 3$

By putting $x = 3$,

L.H.S. = $3 + 3 = 6 \neq$ R.H.S.

∴ No, the equation is not satisfied.

(ii) $x + 3 = 0$

L.H.S. = $x + 3$ By

putting $x = 0$,

L.H.S. = $0 + 3 = 3 \neq$ R.H.S.

∴ No, the equation is not satisfied.

(iii) $x + 3 = 0$ L.H.S. = $x + 3$ By putting $x = -3$,

L.H.S. = $-3 + 3 = 0$ = R.H.S.

∴ Yes, the equation is satisfied.

(iv) $x - 7 = 1$ L.H.S. = $x - 7$ By putting $x = 7$,

L.H.S. = $7 - 7 = 0 \neq$ R.H.S.

∴ No, the equation is not satisfied.

(v) $x - 7 = 1$

L.H.S. = $x - 7$ By

putting $x = 8$,

L.H.S. = $8 - 7 = 1$ = R.H.S.

∴ Yes, the equation is satisfied.

(vi) $5x = 25$ L.H.S. = $5x$ By putting $x = 0$,

L.H.S. = $5 \times 0 = 0 \neq$ R.H.S.

∴ No, the equation is not satisfied.

(vii) $5x = 25$

L.H.S. = $5x$

By putting $x = 5$,

L.H.S. = $5 \times 5 = 25$ = R.H.S.

∴ Yes, the equation is satisfied.

(viii) $5x = 25$

L.H.S. = $5x$ By putting $x = -5$,

L.H.S. = $5 \times (-5) = -25 \neq$ R.H.S.

∴ No, the equation is not satisfied.

(ix) $\left|\frac{m}{3}\right| = 2$

L.H.S. = $\left|\frac{m}{3}\right|$

By putting $m = -6$,

L. H. S. = $\left|\frac{-6}{3} = -2\right|$ ≠ R.H.S.

∴No, the equation is not satisfied. ≠ R.H.S.

(x) $\left|\frac{m}{3}\right| = 2$ No, the equation is not satisfied.

L.H.S. = $\left|\frac{m}{3}\right|$

By putting $m = 0$,

L.H.S. = $\left|\frac{0}{3} = 0\right|$

∴

(xi) $\left|\frac{m}{3}\right| = 2$ L.H.S. = = R.H.S.

∴ Yes, the equation is satisfied.

L.H.S. = $\left|\frac{m}{3}\right|$

By putting $m = 6$,

$\left|\frac{6}{3} = 2\right|$

Q2 :

Check whether the value given in the brackets is a solution to the given equation or not:

(a) $n + 5 = 19$ ($n = 1$) (b) $7n + 5 = 19$ ($n = -2$)

(c) $7n + 5 = 19$ ($n = 2$) (d) $4p - 3 = 13$ ($p = 1$)

(e) $4p - 3 = 13$ ($p = -4$) (f) $4p - 3 = 13$ ($p = 0$)

Answer :

(a) $n + 5 = 19$ ($n = 1$) Putting $n = 1$ in L.H.S., $n + 5 = 1 + 5 = 6 \neq 19$

As L.H.S. ≠ R.H.S.,

Therefore, $n = 1$ is not a solution of the given equation, $n + 5 = 19$.

(b) $7n + 5 = 19$ ($n = -2$)

Putting $n = -2$ in L.H.S.,

$7n + 5 = 7 \times (-2) + 5 = -14 + 5 = -9 \neq 19$

As L.H.S. ≠ R.H.S.,
Therefore, $n = -2$ is not a solution of the given equation, $7n + 5 = 19$.

(c) $7n + 5 = 19$ ($n = 2$)

Putting $n = 2$ in L.H.S.,

$7n + 5 = 7 \times (2) + 5 = 14 + 5 = 19$ = R.H.S. As
L.H.S. = R.H.S.,

Therefore, $n = 2$ is a solution of the given equation, $7n + 5 = 19$.

(d) $4p - 3 = 13$ ($p = 1$)

Putting $p = 1$ in L.H.S.,

$4p - 3 = (4 \times 1) - 3 = 1 \neq 13$

As L.H.S ≠ R.H.S.,

Therefore, $p = 1$ is not a solution of the given equation, $4p - 3 = 13$.

(e) $4p - 3 = 13$ ($p = -4$)

Putting $p = -4$ in L.H.S.,

$4p - 3 = 4 \times (-4) - 3 = - 16 - 3 = -19 \neq 13$

As L.H.S. ≠ R.H.S.,

Therefore, $p = -4$ is not a solution of the given equation, $4p - 3 = 13$.

(f) $4p - 3 = 13$ ($p = 0$)

Putting $p = 0$ in L.H.S.,

$4p - 3 = (4 \times 0) - 3 = -3 \neq 13$

As L.H.S. ≠ R.H.S.,

Therefore, $p = 0$ is not a solution of the given equation, $4p - 3 = 13$.

Q3 :
Solve the following equations by trial and error method:

(i) $5p + 2 = 17$ (ii) $3m - 14 = 4$

Answer :

(i) $5p + 2 = 17$

Putting $p = 1$ in L.H.S.,

$(5 \times 1) + 2 = 7 \neq$ R.H.S.

Putting $p = 2$ in L.H.S.,

$(5 \times 2) + 2 = 10 + 2 = 12 \neq$ R.H.S.

Putting $p = 3$ in L.H.S.,

$(5 \times 3) + 2 = 17$ = R.H.S.

Hence, $p = 3$ is a solution of the given equation.

(ii) $3m - 14 = 4$

Putting $m = 4$,

$(3 \times 4) - 14 = -2 \neq$ R.H.S.

Putting $m = 5$,
(3 x 5) - 14 = 1 ≠ R.H.S.

Putting $m = 6$,

(3 x 6) - 14 = 18 - 14 = 4 = R.H.S.

Hence, $m = 6$ is a solution of the given equation.

Q4 :
Write equations for the following statements:

(i) The sum of numbers *x* and 4 is 9.

(ii) 2 subtracted from *y* is 8.

(iii) Ten times *a* is 70.

(iv) The number *b* divided by 5 gives 6.

(v) Three-fourth of *t* is 15.

(vi) Seven times *m* plus 7 gets you 77.

(vii) One-fourth of a number *x* minus 4 gives 4.

(viii) If you take away 6 from 6 times *y*, you get 60.

(ix) If you add 3 to one-third of *z*, you get 30.

Answer :

(i) $x + 4 = 9$

(ii) $y - 2 = 8$

(iii) $10a = 70$

$\frac{b}{5} = 6$ (iv)

$\frac{3}{4}t = 15$ (v)

(vi) Seven times of m is $7m$.

$7m + 7 = 77$

(vii) One-fourth of a number x is $\frac{x}{4}$.

$\frac{x}{4} - 4 = 4$

(viii) Six times of y is $6y$.

$6y - 6 = 60$

(ix) One-third of z is $\frac{z}{3}$.

$\frac{z}{3} + 3 = 30$

Q5 :

Write the following equations in statement forms:

(i) $p + 4 = 15$ (ii) $m - 7 = 3$

(iii) $2m = 7$ (iv) $\frac{m}{5} = 3$

(v) $\frac{3m}{5} = 6$ **(vi) $3p + 4 = 25$**

(vii) $4p - 2 = 18$ (viii) $\frac{p}{2} + 2 = 8$

Answer :

(i) The sum of p and 4 is 15.

(ii) 7 subtracted from m is 3.

(iii) Twice of a number m is 7.

(iv) One-fifth of m is 3.

(v) Three-fifth of m is 6.

(vi) Three times of a number p, when added to 4, gives 25.

(vii) When 2 is subtracted from four times of a number p, it gives 18.

(viii) When 2 is added to half of a number p, it gives 8.

Q6 :

Set up an equation in the following cases:

(i) Irfan says that he has 7 marbles more than five times the marbles Parmit has. Irfan has 37 marbles. (Take m to be the number of Parmit's marbles.)

(ii) Laxmi's father is 49 years old. He is 4 years older than three times Laxmi's age. (Take Laxmi's age to be $y$years.)

(iii)The teacher tells the class that the highest marks obtained by a student in her class is twice the lowest marks plus 7. The highest score is 87. (Take the lowest score to be l.)

(iv)In an isosceles triangle, the vertex angle is twice either base angle. (Let the base angle be b in degrees. Remember that the sum of angles of a triangle is 180 degrees.)

Answer :

(i) Let Parmit has m marbles.

5 x Number of marbles Parmit has + 7 = Number of marbles Irfan has

5 x m + 7 = 37

$5m + 7 = 37$

(ii) Let Laxmi be y years old.

3 x Laxmi's age + 4 = Laxmi's father's age

3 x y + 4 = 49

$3y + 4 = 49$

(iii) Let the lowest marks be *l*.
2 x Lowest marks + 7 = Highest marks

2 x *l* + 7 = 87

2 *l* + 7 = 87

(iv) An isosceles triangle has two of its angles of equal measure.

Let base angle be *b*.

Vertex angle = 2 x Base angle = 2*b*

Sum of all interior angles of a Δ = 180° *b*

+ *b* + 2*b* = 180°

4*b* = 180°

Exercise 4.2 : Solutions of Questions on Page Number : **86**

Q1 :

Give first the step you will use to separate the variable and then solve the equation:

(a) *x* + 1 = 0 (b) *x* + 1 = 0 (c) *x* - 1 = 5

(d) *x* + 6 = 2 (e) *y* - 4 = - 7 (f) *y* - 4 = 4

(g) *y* + 4 = 4 (h) *y* + 4 = - 4

Answer :

(a) *x* - 1 = 0

Adding 1 to both sides of the given equation, we obtain

x - 1 + 1 = 0 + 1 *x* = 1

(b) *x* + 1 = 0

Subtracting 1 from both sides of the given equation, we obtain

x + 1 - 1 = 0 - 1 *x* = -1

(c) *x* - 1 = 5

Adding 1 to both sides of the given equation, we obtain

x - 1 + 1 = 5 + 1 *x* = 6

(d) *x* + 6 = 2

Subtracting 6 from both sides of the given equation, we obtain

x + 6 - 6 = 2 - 6 *x* = -4

(e) *y* - 4 = -7

Adding 4 to both sides of the given equation, we obtain

y - 4 + 4 = - 7 + 4 *y* = -3

(f) *y* - 4 = 4

Adding 4 to both sides of the given equation, we obtain *y*

- 4 + 4 = 4 + 4

y = 8 (g) *y* + 4

= 4

Subtracting 4 from both sides of the given equation, we obtain

$y + 4 - 4 = 4 - 4\ y = 0$

(h) $y + 4 = -4$

Subtracting 4 from both sides of the given equation, we obtain
$y + 4 - 4 = -4 - 4\ y = -8$

Q2 :
Give first the step you will use to separate the variable and then solve the equation:

(a) 3*l* = 42 $\frac{b}{2}=6$ **(c)** $\frac{p}{7}=4$ **(b)**

$\frac{z}{3}=\frac{5}{4}$

(d) 4*x* = 25 **(e) 8*y* = 36 (f)**

(g) $\frac{a}{5}=\frac{7}{15}$ **(h) 20*t* = - 10**

Answer :

(a) 3*l* = 42

Dividing both sides of the given equation by 3, we obtain

$\frac{3l}{3}=\frac{42}{3}$

$l = 14$

(b) $\frac{b}{2}=6$

Multiplying both sides of the given equation by 2, we obtain

$\frac{b\times 2}{2}=6\times 2$

$b = 12$

(c) $\frac{p}{7}=4$

$\frac{p\times 7}{7}=4\times 7$

$p = 28$

(d) $4x = 25$

Multiplying both sides of the given equation by 7, we obtain

$\frac{4x}{4}=\frac{25}{4}$

Dividing both sides of the given equation by 4, we obtain

$x = \frac{25}{4}$

(e) $8y = 36$

Dividing both sides of the given equation by 8, we obtain

$$\frac{8y}{8} = \frac{36}{8}$$

$$y = \frac{9}{2}$$

(f) $\frac{z}{3} = \frac{5}{4}$

$\frac{z \times 3}{3} = \frac{5 \times 3}{4}$ Multiplying both sides of the given equation by 3, we obtain

$$z = \frac{15}{4}$$

(g) $\frac{a}{5} = \frac{7}{15}$

$\frac{a \times 5}{5} = \frac{7 \times 5}{15}$ Multiplying both sides of the given equation by 5, we obtain Dividing both sides of the given equation by 20, we obtain

$$a = \frac{7}{3}$$

(h) $20t = -10$

$$\frac{20t}{20} = \frac{-10}{20}$$

$$t = \frac{-1}{2}$$

Q3 :

Give the steps you will use to separate the variable and then solve the equation:

(a) 3*n* - 2 = 46 (b) 5*m* + 7 = 17 (c) $\frac{20p}{3} = 40$

(d) $\frac{3p}{10}=6$

Answer :

(a) 3*n* - 2 = 46

(b) 5*m* + 7 = 17

Subtracting 7 from both sides of the given equation, we obtain

(c) $\frac{20p}{3}=40$

Adding 2 to both sides of the given equation, we obtain

3*n* - 2 + 2 = 46 + 2

3*n* = 48

Dividing both sides of the given equation by 3, we obtain

$\frac{3n}{3}=\frac{48}{3}$

n = 16

5*m* + 7 - 7 = 17 - 7

5*m* = 10

Dividing both sides of the given equation by 5, we obtain

$\frac{5m}{5}=\frac{10}{5}$

$m=2$

Multiplying both sides of the given equation by 3, we obtain

$\frac{20p\times3}{3}=40\times3$

$20p=120$

Dividing both sides of the given equation by 20, we obtain

$\frac{20p}{20}=\frac{120}{20}$

$p=6$

Multiplying both sides of the given equation by 10, we obtain Dividing both sides of the given equation by 3, we obtain

$\frac{3p\times10}{10}=6\times10$

$3p=60$

(d) $\frac{3p}{10}=6$

$$\frac{3p}{3}=\frac{60}{3}$$

$p = 20$

Q4 :

Solve the following equations:

(a) 10p = 100 (b) 10p + 10 = 100 (c) $\frac{p}{4}=5$

(d) $\frac{-p}{3}=5$ **(e)** $\frac{3p}{4}=6$ **(f) 3s = - 9**

(g) 3s + 12 = 0 (h) 3s = 0 (i) 2q = 6

(j) 2q - 6 = 0 (k) 2q + 6 = 0 (l) 2q + 6 = 12

Answer :

(a) 10 p = 100

$$\frac{10p}{10}=\frac{100}{10}$$
$$p=10$$

(b) 10 p + 10 = 100

10 p + 10 - 10 = 100 - 10

10 p = 90

$$\frac{10p}{10}=\frac{90}{10}$$
$$p=9$$

(c) $\frac{p}{4}=5$

$$\frac{p\times 4}{4}=5\times 4$$
$$p=20$$

(d) $\frac{-p}{3}=5$

$$\frac{-p\times(-3)}{3}=5\times(-3)$$
$$p=-15$$

(e)

$$\frac{3p}{4} = 6$$

$$\frac{3p \times 4}{4} = 6 \times 4$$

$$3p = 24$$

$$\frac{3p}{3} = \frac{24}{3}$$

$$p = 8$$

(f) 3 s = - 9

$$\frac{3s}{3} = \frac{-9}{3}$$

$$s = -3$$

(g) 3 s + 12 = 0

3 s + 12 - 12= 0 - 12

3 s = - 12

$$\frac{3s}{3} = \frac{-12}{3}$$

$$s = -4$$

(h) 3 s = 0

$$\frac{3s}{3} = \frac{0}{3}$$

$$s = 0$$

(i) 2q = 6

$$\frac{2q}{2} = \frac{6}{2}$$

$$q = 3$$

(j) 2q - 6 = 0

2q - 6 + 6 = 0 + 6

2q = 6

$$\frac{2q}{2} = \frac{6}{2}$$

$$q = 3$$

(k) 2q + 6 = 0

2q + 6 - 6 = 0 - 6

2q = - 6

$$\frac{2q}{2}=\frac{-6}{2}$$
$$q=-3$$

(I) $2q + 6 = 12$

$2q + 6 - 6 = 12 - 6$

$2q = 6$

$$\frac{2q}{2}=\frac{6}{2}$$
$$q=3$$

Exercise 4.3 : Solutions of Questions on Page Number : **89**

Q1 :

Solve the following equations.

(a) $2y+\frac{5}{2}=\frac{37}{2}$ (b) $5t + 28 = 10$ (c) $\frac{a}{5}+3=2$

(d) $\frac{q}{4}+7=5$ (e) $\frac{5}{2}x=-10$ (f) $\frac{5}{2}x=\frac{25}{4}$

(g) $7m+\frac{19}{2}=13$ (h) $6z + 10 = - 2$ (i) $\frac{3l}{2}=\frac{2}{3}$

(j) $\frac{2b}{3}-5=3$

Answer :

(a) $2y+\frac{5}{2}=\frac{37}{2}$

$$2y=\frac{37}{2}-\frac{5}{2}=\frac{32}{2}=16$$

Dividing both sides by 2,

$$y=\frac{16}{2}=8$$

(b) $5t + 28 = 10$ (Transposing $\frac{5}{2}$ to R.H.S.)

$5t = 10 - 28 = - 18$ (Transposing 28 to R.H.S.)

Dividing both sides by 5,

$$t = \frac{-18}{5}$$

(c) $\frac{a}{5} + 3 = 2$

$\frac{a}{5} = 2 - 3 = -1$ (Transposing 3 to R.H.S.)

Multiplying both sides by 5,

$a = -1 \times 5 = -5$

(d) $\frac{q}{4} + 7 = 5$

$\frac{q}{4} = -2$ (Transposing 7 to R.H.S.)

Multiplying both sides by 4, q

$= -8$

(e) $\frac{5}{2}x = -10$

Multiplying both sides by 2,

$5x = -10 \times 2 = -20$

Dividing both sides by 5,

$$x = \frac{-20}{5} = -4$$

(f) $\frac{5}{2}x = \frac{25}{4}$

Multiplying both sides by 2,

$$5x = \frac{25}{4} \times 2 = \frac{25}{2}$$

Dividing both sides by 5,

$$x = \frac{25}{2} \times \frac{1}{5} = \frac{5}{2}$$

(g) $7m + \frac{19}{2} = 13$

$$7m = 13 - \frac{19}{2} = \frac{26 - 19}{2}$$

$$7m = \frac{7}{2}$$

Dividing both sides by 7,

$$m = \frac{1}{2}$$

(h) $6z + 10 = -2$ (Transposing $\frac{19}{2}$ to R.H.S.)

$6z = -2 - 10 = -12$ (Transposing 10 to R.H.S.)

Dividing both sides by 6,

$$z = \frac{-12}{6} = -2$$

(i) $\frac{3l}{2} = \frac{2}{3}$

Multiplying both sides by 2,

$$3l = \frac{2}{3} \times 2 = \frac{4}{3}$$

Dividing both sides by 3,

$$l = \frac{4}{3} \times \frac{1}{3} = \frac{4}{9}$$

(j) $\frac{2b}{3} - 5 = 3$

$\frac{2b}{3} = 3 + 5 = 8$ (Transposing - 5 to R.H.S.)

Multiplying both sides by 3,

$2b = 8 \times 3 = 24$ Dividing both sides by 2,

$b = \frac{24}{2} = 12$

Q2 :

Solve the following equations.

(a) 2 (*x* + 4) = 12 (b) 3 (*n* - 5) = 21

(c) 3 (*n* - 5) = - 21 (d) -4 (2 + *x*) = 8

(e) 4(2 - *x*) = 8

Answer :

(a) 2 (*x* + 4) = 12

Dividing both sides by 2,

$$x + 4 = \frac{12}{2} = 6$$

x = 6 - 4 = 2 (Transposing 4 to R.H.S.)

(b) 3 (*n* - 5) = 21

Dividing both sides by 3,

$$n - 5 = \frac{21}{3} = 7$$

n = 7 + 5 = 12 (Transposing - 5 to R.H.S.)

(c) 3 (n - 5) = - 21

Dividing both sides by 3,

$$n-5=\frac{-21}{3}=-7$$

n = - 7 + 5 = - 2 (Transposing - 5 to R.H.S.)

(d) - 4 (2 + x) = 8

Dividing both sides by - 4,

$$2+x=\frac{8}{-4}=-2$$

x = - 2 - 2 = - 4 (Transposing 2 to R.H.S.)

(e) 4 (2 - x) = 8

Dividing both sides by 4,

2 - x = 2

- x = 2 - 2 (Transposing 2 to R.H.S.)

- x = 0 x = 0

Q3 :
Solve the following equations.

(a) 4 = 5 (p - 2) (b) - 4 = 5 (p - 2)

(c) 16 = 4 + 3 (t + 2) (d) 4 + 5 (p - 1) = 34

(e) 0 = 16 + 4 (m - 6)

Answer :

(a) 4 = 5 (p - 2)

Dividing both sides by 5,

$$\frac{4}{5}=p-2$$

$$\frac{4}{5}+2=p \qquad \text{(Transposing } -2 \text{ to L.H.S.)}$$

$$\frac{4+10}{5}=p$$

$$\frac{14}{5}=p$$

(b) - 4 = 5 (p - 2)

Dividing both sides by 5,

$$-\frac{4}{5} = p - 2$$

$$-\frac{4}{5} + 2 = p \qquad \text{(Transposing } -2 \text{ to L.H.S.)}$$

$$\frac{-4+10}{5} = p$$

$$\frac{6}{5} = p$$

(c) 16 = 4 + 3 (t + 2)

16 - 4 = 3 (t + 2) (Transposing 4 to L.H.S.)

12 = 3 (t + 2)

Dividing both sides by 3,

$$\frac{12}{3} = t + 2$$

4 = t + 2

4 - 2 = t (Transposing 2 to L.H.S.)

2 = t

(d) 4 + 5 (p - 1) = 34

5 (p - 1) = 34 - 4 = 30 (Transposing 4 to R.H.S.)

Dividing both sides by 5,

$$p - 1 = \frac{30}{5} = 6$$

p = 6 + 1 = 7 (Transposing - 1 to R.H.S.)

(e) 0 = 16 + 4 (m - 6)

0 = 16 + 4m - 24

0 = - 8 + 4m

4m = 8 (Transposing - 8 to L.H.S) Dividing both sides by 4, m = 2

Q4 :

(a) Construct 3 equations starting with x = 2

(b) Construct 3 equations starting with x = - 2

Answer :

(a) x = 2

Multiplying both sides by 5,

5x = 10 (i)

Subtracting 3 from both sides,
5x - 3 = 10 - 3

5 x - 3 = 7 (ii)

Dividing both sides by 2,

$$\frac{5x}{2}-\frac{3}{2}=\frac{7}{2} \quad \text{(iii)}$$

(b) $x = -2$

Subtracting 2 from both sides, x

$-2 = -2 - 2$ $x - 2 = -4$ (i)

Again, $x = -2$

Multiplying by 6,

$6 \times x = -2 \times 6$

$6x = -12$

Subtracting 12 from both sides,

$6x - 12 = -12 - 12$

$6x - 12 = -24$ (ii)

Adding 24 to both sides,

$6x - 12 + 24 = -24 + 24$

$6x + 12 = 0$ (iii)

Exercise 4.4 : Solutions of Questions on Page Number : **91**

Q1 :

Set up equations and solve them to find the unknown numbers in the following cases:

(a) Add 4 to eight times a number; you get 60.

(b) One-fifth of a number minus 4 gives 3.

(c) If I take three-fourths of a number and add 3 to it, I get 21.

(d) When I subtracted 11 from twice a number, the result was 15.

(e) Munna subtracts thrice the number of notebooks he has from 50, he finds the result to be 8.

(f) Ibenhal thinks of a number. If she adds 19 to it and divides the sum by 5, she will get 8.

(g) Anwar thinks of a number. If he takes away 7 from $\frac{5}{2}$ of the number, the result is 23.

Answer :

(a) Let the number be x.

8 times of this number = $8x$

$8x + 4 = 60$

$8x = 60 - 4$ (Transposing 4 to R.H.S.)

$8x = 56$

Dividing both sides by 8,

$$\frac{8x}{8}=\frac{56}{8}$$
$$x=7$$

(b) Let the number be *x*.

$$\frac{x}{5}$$

One-fifth of this number =

$$\frac{x}{5}-4=3$$

$$\frac{x}{5}=3+4$$ (Transposing - 4 to R.H.S.)

$$\frac{x}{5}=7$$

Multiplying both sides by 5,

$$\frac{x\times 5}{5}=7\times 5$$
$$x=35$$

(c) Let the number be *x*.

Three-fourth of this number = $\frac{3x}{4}$

$$\frac{3}{4}x+3=21$$

$$\frac{3}{4}x=18$$ (Transposing 3 to R.H.S.)

Multiplying both sides by 4,

$$\frac{3x\times 4}{4}=18\times 4$$
$$3x=72$$

Dividing both sides by 3,

$$\frac{3x}{3}=\frac{72}{3}$$
$$x=24$$

(d) Let the number be *x*.

Twice of this number = 2*x*

2*x* - 11 = 15

2*x* = 15 + 11 (Transposing - 11 to R.H.S.)

$2x = 26$

Dividing both sides by 2,

$$\frac{2x}{2} = \frac{26}{2}$$

$x = 13$

(e) Let the number of books be x.

Thrice the number of books = $3x$

$50 - 3x = 8$

$-3x = 8 - 50$ (Transposing 50 to R.H.S.) -

$3x = -42$

Dividing both sides by - 3,

$$\frac{-3x}{-3} = \frac{-42}{-3}$$
$$x = 14$$

(f) Let the number be x.

$$\frac{x+19}{5} = 8$$

Multiplying both sides by 5,

$$\frac{(x+19)\times 5}{5} = 8\times 5$$

$x + 19 = 40$

$x = 40 - 19$ (Transposing 19 to R.H.S.) x

$= 21$

(g) Let the number be x.

$\frac{5}{2}$ of this number = $\frac{5x}{2}$

$$\frac{5x}{2} - 7 = 23$$

$$\frac{5x}{2} = 23 + 7 \quad \text{(Transposing } -7 \text{ to R.H.S)}$$
$$\frac{5x}{2} = 30$$

Multiplying both sides by 2,

$$\frac{5x\times 2}{2} = 30\times 2$$
$$5x = 60$$

Dividing both sides by 5,

$$\frac{5x}{5}=\frac{60}{5}$$
$$x=12$$

Q2 :
Solve the following:

(a) The teacher tells the class that the highest marks obtained by a student in her class is twice the lowest marks plus 7. The highest score is 87. What is the lowest score?

(b) In an isosceles triangle, the base angles are equal. The vertex angle is 40°. What are the base angles of the triangle? (Remember, the sum of three angles of a triangle is 180°).

(c) Sachin scored twice as many runs as Rahul. Together, their runs fell two short of a double century. How many runs did each one score?

Answer :

(a) Let the lowest score be *l*.

2 × Lowest marks + 7 = Highest marks

2*l* + 7 = 87

2*l* = 87 - 7 (Transposing 7 to R.H.S.)

2*l* = 80

Dividing both sides by 2,

$$\frac{2l}{2}=\frac{80}{2}$$
$$l=40$$

Therefore, the lowest score is 40.

(b) Let the base angles be equal to *b*.

The sum of all interior angles of a triangle is 180°.

b + *b* + 40° = 180°

2*b* + 40° = 180°

2*b* = 180 º - 40 º = 140 º (Transposing 40 º to R.H.S.)

Dividing both sides by 2,

$$\frac{2b}{2}=\frac{140^\circ}{2}$$
$$b=70^\circ$$

Therefore, the base angles of the triangle are of 70 º measure.

(c) Let Rahul's score be *x*.

Therefore, Sachin's score = 2*x*

Rahul's score + Sachin's score = 200 - 2

2*x* + *x* = 198

3*x* = 198
Dividing both sides by 3,

$$\frac{3x}{3}=\frac{198}{3}$$

$x = 66$

Rahul's score = 66

Sachin's score = 2 × 66 = 132

Q3 :

Solve the following:

(i) Irfan says that he has 7 marbles more than five times the marbles Parmit has. Irfan has 37 marbles. How many marbles does Parmit have?

(ii) Laxmi's father is 49 year old. He is 4 years older than three times Laxmi's age. What is Laxmi's age?

(iii)People of Sundargram planted trees in the village garden. Some of the trees were fruit trees. The number of non-fruit trees was two more than three times the number of fruit trees. What was the number of fruit trees planted if the number of non-fruit trees planted was 77?

Answer :

(i) Let Parmit's marbles equal x.

5 times the number of marbles Parmit has = $5x$

$5x + 7 = 37$

$5x = 37 - 7 = 30$ (Transposing 7 to R.H.S.)

Dividing both sides by 5,

$$\frac{5x}{5}=\frac{30}{5}$$
$$x=6$$

Therefore, Parmit has 6 marbles.

(ii) Let Laxmi's age be x years.

3 × Laxmi's age + 4 = Her father's age

$3x + 4 = 49$

$3x = 49 - 4$ (Transposing 4 to R.H.S.)

$3x = 45$

Dividing both sides by 3,

$$\frac{3x}{3}=\frac{45}{3}$$

$x = 15$

Therefore, Laxmi's age is 15 years.

(iii) Let the number of fruit trees be x.

3 × Number of fruit trees + 2 = Number of non-fruit trees

$3x + 2 = 77$
$3x = 77 - 2$ (Transposing 2 to R.H.S.)

$3x = 75$

Dividing both sides of the equation by 3,

$$\frac{3x}{3} = \frac{75}{3}$$

$x = 25$

Therefore, the number of fruit trees was 25.

Q4 :
Solve the following riddle:

I am a number, Tell my

identity! Take me seven

times over And add a fifty!

To reach a triple century

You still need forty!

Answer :

Let the number be x.

$(7x + 50) + 40 = 300$

$7x + 90 = 300$

$7x = 300 - 90$ (Transposing 90 to R.H.S.)

$7x = 210$

Dividing both sides by 7,

$$\frac{7x}{7} = \frac{210}{7}$$

$x = 30$

Therefore, the number is 30.

Q2 :

Write four more rational numbers in each of the following patterns:

(i) $\frac{-3}{5}, \frac{-6}{10}, \frac{-9}{15}, \frac{-12}{20}, \ldots$ (ii) $\frac{-1}{4}, \frac{-2}{8}, \frac{-3}{12}, \ldots$

(iii) $\frac{-1}{6}, \frac{2}{-12}, \frac{3}{-18}, \frac{4}{-24}, \ldots$ (iv) $\frac{-2}{3}, \frac{2}{-3}, \frac{4}{-6}, \frac{6}{-9}, \ldots$

Answer :

(i) $\frac{-3}{5}, \frac{-6}{10}, \frac{-9}{15}, \frac{-12}{20} \ldots$

$\frac{-3}{5}, \frac{-3\times 2}{5\times 2}, \frac{-3\times 3}{5\times 3}, \frac{-3\times 4}{5\times 4} \ldots$

It can be observed that the numerator is a multiple of 3 while the denominator is a multiple of 5 and as we increase them further, these multiples are increasing. Therefore, the next four rational numbers in this pattern are

$\frac{-3\times 5}{5\times 5}, \frac{-3\times 6}{5\times 6}, \frac{-3\times 7}{5\times 7}, \frac{-3\times 8}{5\times 8} \ldots$

$\frac{-15}{25}, \frac{-18}{30}, \frac{-21}{35}, \frac{-24}{40} \ldots$

(ii)

$\frac{-1}{4}, \frac{-2}{8}, \frac{-3}{12} \ldots$

$\frac{-1}{4}, \frac{-1\times 2}{4\times 2}, \frac{-1\times 3}{4\times 3} \ldots$

The next four rational numbers in this pattern are

$\frac{-1\times 4}{4\times 4}, \frac{-1\times 5}{4\times 5}, \frac{-1\times 6}{4\times 6}, \frac{-1\times 7}{4\times 7} \ldots$

$\frac{-4}{16}, \frac{-5}{20}, \frac{-6}{24}, \frac{-7}{28} \ldots$

(iii)

$\frac{-1}{6}, \frac{2}{-12}, \frac{3}{-18}, \frac{4}{-24} \ldots$

$\frac{-1}{6}, \frac{1\times 2}{-6\times 2}, \frac{1\times 3}{-6\times 3}, \frac{1\times 4}{-6\times 4} \ldots$

The next four rational numbers in this pattern are

$\frac{1\times 5}{-6\times 5}, \frac{1\times 6}{-6\times 6}, \frac{1\times 7}{-6\times 7}, \frac{1\times 8}{-6\times 8} \ldots$

$\frac{5}{-30}, \frac{6}{-36}, \frac{7}{-42}, \frac{8}{-48} \ldots$

$m - 5 = (3 \times 2) - 5 = 6 - 5 = 1$

(iii) $9 - 5m = 9 - (5 \times 2) = 9 - 10 = -1$

(iv) $3m^2 - 2m - 7 = 3 \times (2 \times 2) - (2 \times 2) - 7$

$= 12 - 4 - 7 = 1$

(v) $\frac{5m}{2} - 4 = \left(\frac{5 \times 2}{2}\right) - 4 = 1$

Q2 :

If $p = -2$, find the value of:

(i) $4p + 7$

(ii) $-3p^2 + 4p + 7$

(iii) $-2p^3 - 3p^2 + 4p + 7$

Answer :

(i) $4p + 7 = 4 \times (-2) + 7 = -8 + 7 = -1$

(ii) $-3p^2 + 4p + 7 = -3 (-2) \times (-2) + 4 \times (-2) + 7$

$= -12 - 8 + 7 = -13$

(iii) $-2p^3 - 3p^2 + 4p + 7$

$= -2 (-2) \times (-2) \times (-2) - 3 (-2) \times (-2) + 4 \times (-2) + 7$

$= 16 - 12 - 8 + 7 = 3$

Q3 :

Find the value of the following expressions, when $x = -1$:

(i) $2x - 7$ (ii) $-x + 2$ (iii) $x^2 + 2x + 1$

(iv) $2x^2 - x - 2$

Answer :

(i) $2x - 7$

$= 2 \times (-1) - 7 = -9$

(ii) $-x + 2 = -(-1) + 2 = 1 + 2 = 3$

(iii) $x^2 + 2x + 1 = (-1) \times (-1) + 2 \times (-1) + 1$

$= 1 - 2 + 1 = 0$