Session: 2024-2025

ASSIGNMENT: MATHEMATICS

FORMATIVE ASSESSMENT-II

CLASS: 7TH

<u>Data Handling</u>

Exercise 3.1

Q1) Find the range of heights of any ten students of your class. Sol) Let us have the heights of 10 students are as follows: 140 cm, 141.5 cm, 138 cm, 150 cm, 161 cm, 138 cm, 140.5 cm, 135.5 cm, 160 cm, 158 cm Here, minimum height = 135.5 cm Maximum height =161 cm \therefore Range = Maximum height – Minimum height = 161 cm — 135.5 cm = 25.5 cm Hence, the required range = 25.5 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.

Sol) Let us form a frequency distribution table:

Marks (x _i)	Tally marks	Frequency (f _i)	f _i x _i
1]	1	1
2	11	2	4
3	1	1	3
4		3	12
5	Ш	5	25
6		4	24
7		2	14
8	1	1	8
9	1	1	9
		20	100

(i) 9 is the highest marks.

(ii) 1 is the lowest marks.

(iii) Range = Max. marks – Min. marks = 9 - 1 = 8

(iv) Arithmetic mean = $\Sigma fixi/\Sigma fi = 100/20 = 5$

Q3) Find the mean of first five whole numbers.

Sol) First 5 whole numbers are 0, 1, 2, 3, 4

: Mean = 0 + 1 + 2 + 3 + 4 = 10 = 2

5

Hence, the required mean = 2.

5

Q 4). A cricketer scores the following runs in eight innings: 58, 76, 40, 35, 46, 45, 0, 100. Find the mean score.

Sol) Following are the scores of the runs in eight innings:58, 76, 40, 35, 46, 45, 0, 100

: Mean = Sum of all runs / Number of innings

=58+76+40+35+46+45+0+100 /8 =400 / 8 = 50

Hence, the required mean = 50.

Q5) Following table shows the points of each player scored in four games:

Player	Game 1	Game 2	Game 3	Game 4
А	14	16	10	10
В	0	8	6	4
С	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?

(iii) B played in all the four games. How would you find the mean?

(iv) Who is the best performer?

Sol) (i) Number of points scored by A in all games are

Game 1 = 14, Game 2 = 16, Game 3 = 10, Game 4 = 10

: Average score = 14+16+10+10/4

=50 / 4 = 12.5

(ii) Since, C did not play Game 3, he played only 3 games. So, the total will be divided by 3.

(iii) Number of points scored by B in all the games are Game 1 = 0, Game 2 = 8, Game 3 = 6, Game 4 = 4

: Average score = 0+8+6+4/4 = 184=4.5

(iv) Mean score of C = 8+11+13/3 = 32/3 = 10.67

Mean score of C = 10.67

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While mean score of A = 12.5Clearly, A is the best performer.

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. Sol) Marks obtained are: 85, 76, 90, 85, 39, 48, 56, 95, 81 and 75 (i)Highest marks = 95Lowest marks = 39(ii) Range of the marks = Highest marks – Lowest marks =95 - 39 = 56(iii) Mean marks Sum of all marks obtained Number of students 85 + 76 + 90 + 85 + 39 + 48 + 56 + 95+81 + 7510 $=\frac{730}{10}=73$

Q7) The enrolment in a school during six consecutive years was as follows: 1555, 1670, 1750, 2013, 2540, 2820. Find the mean enrolment of the school for this period.

Sol) Mean enrolment

 $= \frac{\text{Sum of the enrolments of all years}}{\text{Number of years}}$ $= \frac{1555 + 1670 + 1750 + 2013 + 2540 + 2820}{6}$ $= \frac{12348}{6} = 2058$

Thus, the required mean = 2058.

Q8)The rainfall (in mm) in a city on 7 days of a certain week was recorded as follows:

Day	Rainfall (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?

Sol) (i) Maximum rainfall = 20.5 mm

Minimum rainfall = 0.0 mm

 \therefore Range = Maximum rainfall – Minimum rainfall

= 20.5 mm - 0.0 mm = 20.5 mm

(ii) Mean rainfall

 $= \frac{\text{Sum of rainfalls (in mm)}}{\text{Number of days}}$ = $\frac{0.0 + 12.2 + 2.1 + 0.0 + 20.5 + 5.5 + 1.0}{7}$ = $\frac{41.3}{7}$ mm = 5.9 mm.

(iii) Number of days on which the rainfall was less than the mean rainfall = Monday, Wednesday, Thursday, Saturday, Sunday = 5 days.

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?

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(iv) What is the mean height of the girls? (v) How many girls have heights more than the mean height? Sol) (i) Height of the tallest girl = 151 cm. (ii) Height of the shortest girl = 128 cm. (iii) Range = Height of tallest girl – Height of the shortest girl = 151 cm - 128 cm = 23 cm. (iv) Mean height = $\frac{\text{Sum of all heights}}{\text{Number of girls}}$ = $\frac{135 + 150 + 139 + 128 + 151 + 132 + 146}{10}$ = $\frac{1414}{10}$ = 141.4 cm

(v) Number of girls having more height than the mean height = 150, 151, 146, 149 and 143 = 5 girls

Exercise 3.2

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? Sol) Given data:19, 25, 23, 20, 9, 20, 15, 10, 5, 16, 25, 20, 24, 12, 20 Let us arrange the given data in increasing order

5, 9, 10, 12, 15, 16, 19, 20, 20, 20, 20, 23, 24, 25, 25
Since 20 occurs 4 times (highest)
∴ Mode = 20 n = 15 (odd)
∴ Median = (n+1 / 2) th term =15+1 / 2 = 8th term = 20 Thus, median = 20 and mode = 20
∴ Mode and median are same. Q2) The runs 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? Sol) Given data: 6, 15, 120, 50, 100, 80, 10, 15, 8, 10, 15

Sum of all the numbers Mean = Number of terms 6 + 15 + 120 + 50 + 100 + 80 + 10 + 15+8+10+1511 $=\frac{429}{11}=39$ Arranging the given data in increasing order, we get 6, 8, 10, 10, 15, 15, 15, 50, 80, 100, 120 Here, 15 occurs 3 times (highest) \therefore Mode = 15 n = 11 (odd) \therefore Median = (11+1 / 2)th term = 6th term = 15 Thus mean = 39, mode = 15 and median = 15No, they are not same. Q4) 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? Sol) Given data: 38, 42, 35, 37, 45, 50, 32, 43, 43, 40, 36, 38, 43, 38, 47 Arranging in increasing order, we get 32, 35, 36, 37, 38, 38, 38, 40, 42, 43, 43, 43, 45, 47, 50 (i) Here, 38 and 42 occur 3 times (highest) Thus mode = 38 and 43 n = 15(odd)Median = (n+1/2)th term = (15+12)th term = 8th term = 40 Thus mode 38 and 43 and median = 40(ii) Yes, the given data has two modes i.e. 38 and 43.

Q4) Find the mode and median of the data:13, 16, 12, 14, 19, 12, 14, 13, 14 Sol) Arranging the given data in increasing order, we get 12, 12, 13, 13, 14, 14, 14, 16, 19

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Here, 14 occur 3 times (highest)
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Thus, mode = 14

n = 9(odd)

: Median = (n+12) th term = (9+12) th term = 5th term = 14 Hence, mode = 14 and median = 14.

Q5) Tell whether the statement is true or false.

(i) The mode is always one of the number 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.

Sol)

- (i) True
- (ii) False
- (iii) True
- (iv) False

Exercise 3.3

Q1) Use the bar graph to answer the following questions.

(a) Which is the most popular pet?

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

Sol) From the given bar graph in figure, we have

(a) Cats are the most popular pet among the students.

(b) 8 students have dog as a pet animal.



Q2) Read the bar graph which shows the number of books sold by a bookstore during five consecutive years and answer the following questions:

(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 year were fewer than 250 books sold?

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



Sol)

From the given bar graph, we have

(i) Number of books sold in the year 1989 is about 180, in 1990 is about 490 and in 1992 is about 295.

(ii) About 475 books were sold in 1990. About 225 books were sold in the year 1992.

(iii) Fewer than 250 books were sold in the years 1989 and 1992.

(iv) On y-axis, the line is divided into 10 small parts of 10 books each. So, we can estimate the number of books sold in 1989 is about 180.

Q3) Number of children in six different classes are given below. Represent the data on a bar graph.

Class	Number of children
Fifth	135
Sixth	120
Seventh	95
Eighth	100

Ninth	90
Tenth	80

(a) How would you choose a scale?

(b) Answer the following questions:

- Which class has the maximum number of children? And the minimum?
- Find the ratio of students of class sixth to £he students of class eighth.

Solution:



(a) Scale on y-axis is 1 cm = 10 students(b)

- Fifth class has the maximum number of children i.e., 135. Tenth class has the minimum number of children i.e., 80.
- Number of children in class eight = 100
 ∴ Ratio of class sixth to the students of class

eighth =
$$\frac{120^6}{100_5} = \frac{6}{5}$$
, i.e., 6:5

Q4) The performance of a student in 1st term and 2nd term is given. Draw a double bar graph choosing appropriate scale and answer the following:

Subject	1st term (M.M. 100)	2nd term (M.M. 100)
English	67	70
Hindi	72	65
Math	88	95
Science	81	85
S. Science	73	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?

Sol)



(i) In Math, the performance of the students improved the most.

(ii) In social science, the performance of the students improved the least.

(iii) Yes, in Hindi the performance of the students has gone down.

Q5) Consider this data collected from survey of a colony.

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

Sol) (i) The above bar graph depicts the number of people who are watching and who are participating in sports.

(ii) Cricket is the most popular sport.

(iii) Watching the sports is more preferred by the people.



Q6) Take the data giving the minimum and the maximum temperature of various cities given in the beginning of this chapter. Plot a double bar graph using the data and answer the following:

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

(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 maximum temperature.

Temperature of cities as on 20.6.2006			
City	Max.	Min.	
Ahmedabad	38°C	29°C	
Amritsar	37°C	26°C	
Bengaluru	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	

Solution:

Double bar graph:



(i) Jammu has the largest difference between the maximum and minimum temperature i.e. $41^{\circ}C - 26^{\circ}C = 15^{\circ}C$

(ii) Hottest city is Jammu with 41°C temperature and coldest city is Bengaluru with 21°C temperature.

(iii)(iii)

- Bengaluru having its maximum temperature 28°C is less than the minimum temperature 29°C in Ahmedabad.
- Bengaluru having its maximum tem-perature 28°C is less than the maximum temperature 29°C in Jaipur.

(iv) Mumbai has the least difference between its minimum and maximum temperatures i.e. $32^{\circ}C - 27^{\circ}C = 5^{\circ}C$

Exercise 3.4

Q1) Tell whether the following situations are certain to happen, impossible to happen, can happen but not certain.

- (i) You are older today than yesterday.
- (ii) A tossed coin will land heads up.

(iii) A dice 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.

Sol)

Event	Chance
(i) You are older today than yesterday.	Certain to happen.
(ii) A tossed coin will land heads up.	Can happen but not certain.
(iii) A dice when tossed shall land up 8 on the top.	Impossible.
(iv) The next traffic light seem will be green.	Can happen but not certain.
(v) Tomorrow will be cloudy day.	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? Solution:

(i) Total number of marbles marked with the number from 1 to 6 = 6

$$\therefore$$
 n(S) = 6

Number of marble marked with 2=1

$$\therefore$$
 n(E) = 1

: Required probability = n(E) / n(S)=1 / 6

(ii) Number of marble marked with 5 = 1

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\therefore n(E) = 1
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: Required probability = n(E) / n(S) = 1 / 6

Q3) A coin is flipped to decide which team starts the game. What is the probability that your team will start?

Sol) Coin has 2 faces—Head (H) and Tail (T)

 \therefore Sample space S(n) = 2

Number of successful event n(E) = 1

: Required probability = n(E) / n(S) = 1 / 2

Simple Equations

Exercise 4.1

Ex 4.1 Class 7 Maths Question 1.

Complete the given column of the table:

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

Solution:

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

Q2) Check whether the value given in the brackets is a solution to the given equation or not:

(a) m+6 = 15; (m = 6)

- (b) 2n + 7 = 13; (n = 3)
- (c) 7n + 5 = 19; (n = 2)
- (d) 4p 3 = 12; (p = 4)

(e) 4p - 3 = 13; (p = 4) (f) 4p+5 = 21; (p = 0) Sol) (a) m + 6 = 15 (m = 6)Put m = 6 in LHS $6+6 = 12 \neq 15$ (RHS) Since LHS \neq RHS Thus m = 6 is not the solution of the given equation. (b) 2n + 7 = 13; (n = 3) Put n = 3 in LHS $2 \times 3 + 7 = 6 + 7 = 13 = 13$ (RHS) Since LHS = RHSThus, n = 3 is the solution of the given equation. (c) 7n+5 = 19; (n = 2) Put n = 2 in LHS $7 \times 2 + 5 = 14 + 5 = 19 = 19$ (RHS) Since LHS = RHS Thus, n - 2 is the solution of the given equation. (d) 4p - 3 = 12; (p = 4) Put p = 4 in LHS $4 \times 4 - 3 = 16 - 3 = 13 \neq 12$ (RHS) Since LHS \neq RHS Thus, p = 1 is not the solution of the given equation. (e) 4p - 3 = 13; (p = 4) Put p = -4 in LHS $4 \times (4) - 3 = 16 - 3 = 13 = 13$ (RHS) Since LHS = RHSThus p = 4 is the solution of the given equation. (f) 4p + 5 = 21; (p = 0)

(f) 4p + 5 = 21; (p = 0)Put p = 0 in LHS $4 \times (0) + 5 = 0 + 5 = 5 \neq 21$ (RHS) Since LHS \neq RHS Thus p = 0 is not the solution of the given equation.

Q3)Solve the following equations by trial and error method:
(i) 5p + 2 = 17
(ii) Try yourself

Solution:

(i) 5p + 2 = 17For p = 1, LHS $= 5 \times 1 + 2 = 5 + 2 = 7 \neq 17$ (RHS) For p = 2, LHS $= 5 \times 2 + 2$ $= 10 + 2 = 12 \neq 17$ (RHS) For p = 3, LHS $= 5 \times 3 + 2$ = 15 + 2 = 17 = 17 (RHS)

Since the given equation is satisfied for p = 3 Thus, p = 3 is the required solution.

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.

Solution:

	Statements	Equations
(<i>i</i>)	The sum of numbers x and 4 is 9.	x + 4 = 9
(<i>ii</i>)	2 subtracted from y is 8 .	y - 2 = 8
(iii)	Ten times a is 70.	10a = 7
(iv)	The number b divided by 5 gives 6.	$\frac{b}{5} = 6$
(v)	Three-fourth of t is 15.	$\frac{3}{4}t = 15$
(vi)	Seven times m plus 7 gets you 77.	7m + 7 = 77
(vii)	One-fourth of a number x minus 4 gives 4.	$\frac{1}{4}x-4 = 4$
(viii)	If you take away 6 from 6 times <i>y</i> , you get 60.	6y - 6 = 60
(<i>ix</i>)	If you add 3 to one-third of z, you get 30.	$\frac{z}{3} + 3 = 30$

Q5) Write the following equations in statement forms. Same as question 4

Q6)

Set up an equation in the following cases:

(i) Imtiyaz says that he has 7 marbles more than five times the marbles Imran has.Imtiyaz has 37 marbles. (Take m to be the number of Imran's marbles)(ii) Gulshan's father is 49 years old. He is 4 years older than three times Gulshan's age. (Take Gulshan'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 1)

(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).

Solution:

(i) Let m be the Imran's marbles.

 \therefore Imtiyaz's marble = 5m + 7

Total number of Imtiyaz's marble is given by 37.

Thus, the required equation is 5m + 7 = 37

(ii) Let Gulshan's age be y years.
∴ Gulshan's father's age = 3y + 4
But the Gulshan's father's age is given by 49
Thus the required equation is 3y + 4 = 49

(iii) Let the lowest score be l.
∴ The highest score = 2l + 1
But the highest score is given by 87.
Thus, the required equation is 2l + 1 = 87

(iv) Let each base angle be 'b' degrees.
∴ Vertex angle of the triangle = 2b
Sum of the angles of a triangle = 180°
∴ Required equation is b + b + 2b = 180° or 4b = 180°

Exercise 4.2

Q1) Given 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 = 4Solution: (a) x - 1 = 0Adding 1 to both sides, we get $x - 1 + 1 = 0 + 1 \Rightarrow x = 1$ Thus, x = 1 is the required solutions. Check: Put x = 1 in the given equations x - 1 = 01 - 1 = 00 = 0LHS = RHSThus x = 1 is the correct solution. (b) x + 1 = 0Subtracting 1 from both sides, we get $x + 1 - 1 = 0 - 1 \Rightarrow x = -1$ Thus x = -1 is the required solution. Check: Put x = -1 in the given equation -1 + 1 = 00 = 0LHS = RHSThus x = -1 is the correct solution. (c) x - 1 = 5Adding 1 to both sides, we get $x - 1 + 1 = 5 + 1 \Rightarrow x = 6$ Thus x = 6 is the required solution. Check: x - 1 = 5

Putting x = 6 in the given equation $6 - 1 = 5 \Rightarrow 5 = 5$ LHS = RHSThus, x = 6 is the correct solution. (d) x + 6 = 2Subtracting 6 from both sides, we get $x + 6 - 6 = 2 - 6 \Rightarrow x = -4$ Thus, x = -4 is the required solution. Check: x + 6 = 2Putting x = -4, we get $-4 + 6 = 2 \Rightarrow 2 = 2$ LHS = RHS Thus x = -4 is the correct solution. (e) y - 4 = -7Adding 4 to both sides, we get $y - 4 + 4 = -7 + 4 \Rightarrow y = -3$ Thus, y = -3 is the required solution. Check: y - 4 = -7Putting y = -3, we get $-3-4 = -7 \Rightarrow -7 = -7$ LHS = RHSThus, y = -3 is the correct solution. (f) y - 4 = 4Adding 4 to both sides, we get $y - 4 + 4 = 4 + 4 \Rightarrow y = 8$ Thus, y = 8 is the required solution. Check: y - 4 = 4Putting y = 8, we get $8 - 4 = 4 \Rightarrow 4 = 4$ LHS = RHSThus y = 8 is the correct solution. (g) y + 4 = 4Subtracting 4 from both sides, we get $y + 4 - 4 = 4 - 4 \Rightarrow y = 0$ Thus y = 0 is the required solution. Check: y + 4 = 4

Putting y = 0, we get $0 + 4 = 4 \Rightarrow 4 = 4$ LHS = RHS Thus y = 0 is the correct solution.

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

(a) $3l = 42$	$(b) \ \frac{b}{2} = 6$
$(c) \ \frac{p}{7} = 4$	(<i>d</i>) $4x = 25$
(e) $8y = 36$	$(f) \ \frac{z}{3} = \frac{5}{4}$
(g) $\frac{a}{5} = \frac{7}{15}$	(<i>h</i>) $20t = -10$

Solution:

(a) 3l = 42Dividin

Dividing both sides by 3, we get

 $3l \div 3 = 42 \div 3 \implies l = \frac{42^{14}}{2} = 14$ l = 14Thus (b) $\frac{b}{2} = 6$ Multiplying both sides by 2, we get $\frac{b}{2} \times 2 = 6 \times 2 \implies b = 12$ Thus, b = 12(c) $\frac{p}{7} = 4$ Multiplying both sides by 7, we get $\frac{p}{7} \times 7 = 4 \times 7 \implies p = 28$ p = 28Thus (d) 4x = 25Dividing both sides by 4, we get $4x \div 4 = 25 \div 4$ $x = \frac{25}{4} = 6\frac{1}{4}$ => $x = 6\frac{1}{4}$ Thus (e) 8y = 36Dividing both sides by 8, we get $8y \div 8 = 36 \div 8$ $y = \frac{36^9}{8_2} = \frac{9}{2} = 4\frac{1}{2}$ => Thus, $y = 4\frac{1}{2}$

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

Multiplying both sides by 3, we get

$$\frac{z}{3} \times 3 = \frac{5}{4} \times 3 \implies z = \frac{15}{4} = 3\frac{3}{4}$$
Thus, $z = 3\frac{3}{4}$
(g) $\frac{a}{5} = \frac{7}{15}$
Multiplying both sides by 5, we get
$$\frac{a}{5} \times 5 = \frac{7}{15} \times \cancel{5} = \frac{7}{3}$$

$$\Rightarrow \quad a = \frac{7}{3} = 2\frac{1}{3}$$
Thus, $a = 2\frac{1}{3}$
(h) $20t = -10$
Dividing both sides by 20, we get
$$20t \div 20 = -10 \div 20 \implies t = \frac{-10}{20} = \frac{-1}{2}$$
Thus $t = \frac{-1}{2}$

Q3) Give the steps you will use to separate the variables and then solve the equation:

(a)
$$3n - 2 = 46$$

(b) $5m + 7 = 17$
(c) $20p3=40$
(d) $3p10=6$
Solution:
(a) $3n - 2 = 46$
 $\Rightarrow 3n - 2 + 2 = 46 + 2$ (adding 2 to both sides)
 $\Rightarrow 3n = 48$
 $\Rightarrow 3n + 3 = 48 \div 3$
 $\Rightarrow n = \frac{48^{16}}{3} = 16$
Thus $n = 16$
(b) $5m + 7 = 17$
 $\Rightarrow 5m + 7 - 7 = 17 - 7$ (Subtracting 7 from both sides)

 $\Rightarrow 5m = 10$ $\Rightarrow 5m + 5 = 10 \div 5 \text{ (Dividing both sides by 5)}$

$$m = \frac{10^2}{5} = 2$$

Thus m = 2

$$\Rightarrow \frac{20p}{3} \times 3 = 40 \times 3$$
(Multiplying both sides by 3)
$$\Rightarrow 20p = 120$$

$$\Rightarrow 20p \div 20 = 120 \div 20$$
(Dividing both side

$$\Rightarrow \qquad p = \frac{120^6}{20} = 6$$

Thus p = 6

(d) 3p10=6

 \Rightarrow 3p10×10=6×10 (Multiplying both sides by 10)

 $\Rightarrow 3p = 60$

 \Rightarrow 3p \div 3 = 60 \div 3 (Dividing both sides by 3)

$$\Rightarrow \qquad p = \frac{\cancel{60}^{20}}{\cancel{3}} = 20$$

Thus p = 20

Q4) Solve the following equations

Try yourself.

Exercise 4.3

Q1) Solve the following equations:

a)
$$3x + 7/2 = 11/2$$

Sol) $3x + 7/2 = 11/2$
 $3x = 11/2 - 7/2$
 $3x = (11 - 7)/2$
 $3x = 4/2$
 $3x = 2$
 $X = 2/3$
b) $5x + 18 = 8$
Sol) $5x + 18 = 8$
 $5x = 8 - 18$
 $5x = -10$
 $X = -10/5$
 $X = -2$
c) $x/5 + 3 = 12$
sol) $x/5 + 3 = 12$
 $X/5 = 12 - 3$
 $X/5 = 9$
 $X = 9 \times 5$
 $X = 45$
d) $6z + 10 = -8$
Sol) $6z + 10 = -8$
 $6z = -8 - 10$
 $6z = -18$
 $Z = -18/6$
 $Z = -3$
e) $3x/2 = 3/4$
Sol) $3X/2 = 3/4$
 $3X = 3/4 \times 2$
 $3X = 6/4$
 $X = 6/12$
 $X = 1/2$

Q2) Solve the following equations: (a) 3(x - 3) = 12(b) 3(P+4) = 21(c) 4(2 + x) = 8(d) 3(2x + 3) = 9(e) -4(2 + x) = 12f) 4(2 + x) = 10Solution: (a) 3(x - 3) = 12 \Rightarrow 3(x - 3) / 3=12 /3 (Dividing both sides by 3) \Rightarrow x - 3 = 4 \Rightarrow x = 4 + 3 (Transposing -3 to RHS) $\Rightarrow x = 7$ Check: Put x = 7 in LHS $3(7 - 3) = 3 \times 4 = 12 = RHS$ (b) 3(p+4) = 21 \Rightarrow 3(p + 4) / 3=21/3 (Dividing both sides by 3) \Rightarrow p+4 = 7 \Rightarrow p = 7 - 4 (Transposing 4 to RHS) p = 3 (c) 4(2 + x) = 8 \Rightarrow 4(2 + x) / 4= 8/4 (Dividing both sides by 4) $\Rightarrow 2 + x = 2$ \Rightarrow x = 2 - 2 (Transposing 5 to RHS) $\Rightarrow x = 0$ Q3) Solve the following equations: (a) 3 = 8(x-3)(b) -5 = 4(x - 2)(c) 15 = 5 + 2(x + 3)(d) (e) 4(m-6) + 15 = 0Sol) a) 3 = 8(x-3)3/8 = 8(x-3)/8[dividing both sides by 8]

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3/8 = x - 3	
3/8 + 3 = x	[transposing -3 to LHS]
(3 + 24) /8 =	X
27 / 8 = x	
Or $x = 27/8$	

b) $-5 = 4(x - 2)$	
-5/4 = 4(x-2)/4	[dividing both sides by 4]
-5/4 = x - 2	
-5/4 + 2 = x	[transposing -2 to LHS]
(-5+8)/4=X	
3/4 = X	
Or $x = 3/4$	
c) $15 = 5 + 2(x+3)$	
15-5 = $2(x+3)$	[transposing 5 to LHS]
10 = 2(x+3)	
10/2 = 2(x+3)/2	[dividing both sides by 2]
5 = x + 3	
5 - 3 = x	[transposing 3 to LHS]
2 = x	
Or $x = 2$	

Exercise 4.4

Q1)Set up equations and solve them to find the unknown numbers in the following cases:

(a) The sum of 5 times a number and 6 is 15.

(b) if 3/5 times a number taken away from 16, the result is the number itself, what is the number.

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

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

(g) When 6 is subtracted from thrice a number, the result is 9. Find the number. Sol)

(a) Let the required number be x.

Step I: 5x + 6

Step II: 5x + 6 = 15 is the required equation

Solving the equation, we have

5x + 6 = 15

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\Rightarrow 5x = 15 - 6 (Transposing 6 to RHS)
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\Rightarrow 5x = 9
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 \Rightarrow 5x/5 = 9 / 5 (Dividing both sides by 5)

 \Rightarrow x = 9 / 5

Thus, 9 / 5 is the required unknown number.

(b) Let the required number be x.

Step I: 16 – 3/5 x X

Step II: 16 - 3X/5 = X is the required equation. 5

Solving the equation, we get

16 - 3X/5 = X

 $\Rightarrow 16 = X + 3X/5$ (Transposing 3X/5 to RHS)

$$\Rightarrow \quad 16 = (5X + 3X)/5$$

 \Rightarrow 16 = 8X/5

 \Rightarrow 16x5 = 8X [transposing 1/5 to LHS]

80 = 8X

80/8 = X [transposing 8 to LHS]

10 = X

The unknown number is 10.

(c) Let the required number be x.

Step I: 34x + 3

Step II: 34x + 3 = 21 is the required equation. Solving the equation, we have

	$\frac{3}{4}x + 3 = 21$
⇒	$\frac{3}{4}x = 21 - 3$ (Transposing 3 to RHS)
⇒	$\frac{3}{4}x = 18$
⇒	$\frac{3}{4}x \times 4 = 18 \times 4$ (Multiplying both sides by 4)
⇒	3x = 72
⇒	$\frac{3x}{3} = \frac{72}{3}$ (Dividing both sides by 3)

 \Rightarrow x = 24 is the required unknown number.

(d) Let the required unknown number be x. Step I: 2x - 11Step II: 2x - 11 = 15 is the required equations. Solving the equation, we have 2x - 11 = 15 $\Rightarrow 2x = 15 + 13$ (Transposing 11 to RHS) $\Rightarrow 2x = 28$ $\Rightarrow 2x2=282$ (Dividing both sides by 2) $\Rightarrow x = 14$ is the required unknown number,

(e) Let the required number be x.

Step I: 50 – 3x

Step II: 50 - 3x = 8 is the required equations.

Solving the equation, we have

50 - 3x = 8

 \Rightarrow -3x = 8 – 50 (Transposing 50 to RHS)

 $\Rightarrow -3x = -42$

 \Rightarrow -3x-3=-42-3 (Dividing both sides by -3)

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 \Rightarrow x = 14 is the required unknown number.

(f) Let the required number be x. Step I: x + 19Step II: x+195Step III: x+195 = 8 is the required equation. Solving the equation, we have x+195 = 8 $\Rightarrow x+195 \times 5 = 8 \times 5$ (Multiplying both sides by 5) $\Rightarrow x + 19 = 40$ $\Rightarrow x = 40 - 19$ (Transposing 19 to RHS) $\therefore x = 21$ is the required unknown number.

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 angle 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) Dhoni scored twice as many runs as Yuvraj. Together, their runs fell two short of a double century. How many runs did each one score? Solution:

(a) Let the lowest score be x.

Step I: Highest marks obtained = 2x + 7

Step II: 2x + 7 = 87 is the required equation. Solving the equation, we have 2x + 7 = 87

 \Rightarrow 2x = 87 – 7 (Transposing 7 to RHS)

 $\Rightarrow 2x = 80$

 \Rightarrow 2x2=802 (Dividing both sides by 2)

 \Rightarrow x = 40 is the required lowest marks.

(b) Let each base angle be x degrees.

Step I: Sum of all angles of the triangle (x + x + 40) degrees.

Step II: $x + x + 40 = 180^{\circ}$

 $\Rightarrow 2x + 40^\circ = 180^\circ$

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Solving the equation, we have $2x + 40^{\circ} = 180^{\circ}$ $2x = 180^{\circ} - 40^{\circ}$ (Transposing 40° to RHS) $2x = 140^{\circ}$ \Rightarrow 2x2=140°2 (Dividing both sides by 2) $\Rightarrow x = 70^{\circ}$ Thus the required each base angle = 70° (c) Let the runs scored by Yuvraj = xRuns scored by Dhoni = 2xStep I: x + 2x = 3xStep II: 3x + 2 = 200Solving the equation, we have 3x + 2 = 200 \Rightarrow 3x = 200 – 2 (Transposing 2 to RHS) $\Rightarrow 3x = 198$ \Rightarrow 3x3=1983 (Dividing both sides by 3) $\Rightarrow x = 66$

Thus, the runs scored by Yuvraj is 66 and the runs scored by Dhoni $=2 \times 66 = 132$

Q3)Solve the following:

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

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

(iii) People of Gulmarg planted trees in a village garden. Some of the trees were fruit trees. The number of non-fruit trees were 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?

Solution:

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(i) Let the number of marbles with Amin has be = x
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Step I: Number of marbles that Mudasir has = 5x + 7

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Step II: 5x + 7 = 37 Solving the equation, we have 5x + 7 = 37
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\Rightarrow 5x = 37 – 7 (Transposing 7 to RHS)
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 $\Rightarrow 5x = 30$

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\Rightarrow 5x5=305 (Dividing both sides by 5)
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\Rightarrow x = 6
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Thus, the required number of marbles = 6.

(ii) Let Neelam's age be x years. Step I: Father's age = 3x + 4Step II: 3x + 4 = 49Solving the equation, we get 3x + 4 = 49 \Rightarrow 3x = 49 – 4 (Transposing to RHS) \Rightarrow 3x = 45 \Rightarrow 3x3=453 (Dividing both sides by 3) $\Rightarrow x = 15$ Thus, the age of Neelam = 15 years (iii) Let the number of planted fruit tree be x. Step I: Number of non-fruit trees = 3x + 2Step II: 3x + 2 = 77Solving the equation, we have 3x + 2 = 77 \Rightarrow 3x = 77 - 2 (Transposing 2 to RHS) \Rightarrow 3x = 75 \Rightarrow 3x3=753 (Dividing both sides by 3) $\Rightarrow x = 25$ Thus, the required number of fruit tree planted = 25Q4) 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! Sol) Suppose my identity number is x. Step I: 7 + 50 Step II: 7x + 50 + 40 = 300 or 7x + 90 = 3007x + 90 = 300Solving the equation, we have \Rightarrow 7x = 300 – 90 (Transforming 90 to RHS) \Rightarrow 7x = 210 \Rightarrow 7x /7=210 /7 (Dividing both sides by 7) Thus, my identity is 30. \Rightarrow x = 30.