ગુજરાત શૈક્ષણિક સંશોધન અને તાલીમ પરિષદ, ગાંધીનગરના પત્ર-ક્રમાંક
જીસીઈઆરટી/સી એન્ડ ઈ/2014/2222, તા. 3-2-2014થી મંજૂર

A Teacher-Hand Book has been prepared sepearately for the teachers and the guardians. Do use it.

Mathematics

Std 5

(Semester I-II)

PLEDGE

India is my country.

All Indians are my brothers and sisters.

I love my country and I am proud of its rich and varied heritage.

I shall always strive to be worthy of it.

I shall respect my parents, teachers and all my elders and treat everyone with courtesy.

I pledge my devotion to my country and its people.

My happiness lies in their well-being and prosperity.

Price : ₹ 63.00

Student's Name : _____

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Standard : _____ **Roll No. :** _____

Gujarat State Board of School Textbooks
'Vidyayan', Sector 10-A, Gandhinagar-382010

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PREFACE

In keeping with the guidelines laid down under NCF-2005 and RTE-2009, structural pedagogical changes have come about in primary education, curriculum and syllabus design and textbooks across India. This change refers to our understanding of concerned subjects and teaching-learning procedure on the whole. The primary objective of this syllabus is to foster creativity, out-of-box thinking, logical and analytical skills among young children keeping this approach in mind, the Textbook Board of Gujarat takes pleasure in introducing the textbook of ***Standard 5 Mathematics*** to students, teachers and parents painstakingly prepared by G.C.E.R.T., Gandhinagar.

IGNUS-erg Team Members have provided vital inputs and guided the State Resource Group members in the entire process of framing new syllabus and designing the textbooks. UNICEF and the core-group members of the concerned subjects have been quite helpful at various junctures.

Before prescribing this textbook in the schools across Gujarat, Gujarati edition book had been introduced in selected schools on an experimental basis. Based on the feedback received from the stakeholders, necessary changes have been incorporated by Gujarat Council of Education and Research Training.

Gujarat State Board of School Textbooks convened a meeting of invited subject-experts and experts from GCERT to prepare the final draft of Gujarati edition textbook before prescribing it in the primary schools across Gujarat.

After that Gujarat State Board of School Textbooks has invited experienced teachers to translate it into english and subject expert teachers reviewed this book and then final edition is prepared.

Every effort has been made to maintain quality of the book and to cater to the taste of young students. We hope that young children will like the four-coloured form of this textbook and make the optimum use of this book. Efforts have been made to make this text book errorfree. Still we solicit suggestions from all the stakeholders.

Dr. Bharat Pandit
Director

Dr. Nitin Pethani
Executive President

Date : 3-3-2015

Gandhinagar

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FUNDAMENTAL DUTIES

It shall be the duty of every citizen of India :

(a) to abide by the Constitution and respect its ideals and institutions, the National Flag and the National Anthem;

(b) to cherish and follow the noble ideals which inspired our national struggle for freedom;

(c) to uphold and protect the sovereignty, unity and integrity of India;

(d) to defend the country and render national service when called upon to do so;

(e) to promote harmony and the spirit of common brotherhood amongst all the people of India transcending religious, linguistic and regional or sectional diversities; to renounce practices derogatory to the dignity of women;

(f) to value and preserve the rich heritage of our composite culture;

(g) to protect and improve the natural environment including forests, lakes, rivers and wild life, and to have compassion for living creatures;

(h) to develop the scientific temper, humanism and the spirit of inquiry and reform;

(i) to safeguard public property and to abjure violence;

(j) to strive towards excellence in all spheres of individual and collective activity so that the nation constantly rises to higher levels of endeavour and achievement.

(k) to provide opportunities for education by the parent or the guardian, to his child or a ward between the age of 6-14 years as the case may be.

* Construction of India : Section 51-C

INDEX

First Semester

Second Semester

About this Text-Book....

This text-book has been prepared with a view to developing expected skills among the students on the basis of Gujarat Curriculum Frame-work (GCF). Special emphasis has been laid acquairing the knowledge through principles by the students in such a way that, they may not resort to craming. The maximum efforts has been made so that the children learn the concepts of Mathematics, students can think logically. Solve the problems, understand the roll of Mathematics in the beauty of nature and can use Mathematics in day-to-day dealings.

Each chapter begins with the activities based on the experiences of the children. The objective is that the students may be inspired to think, may do similar experiments and finally; what they have learnt may be evaluated as per method of ERAC by themselves.

For the preparation of this new text-book the parameters decided are : syllabus according to the age-group of children, continuity and co-ordination of concepts of two standards, simple and short presentations, life-oriented concepts as per guidelines of RTE and utility of local objects. A group of Mathematics teachers directly teching in the primary schools who are selected in SRG have prepared and reviewed this text-book as per the parameters mentioned here. This final script has been prepared with appropriate correction after getting reviewed by the experts of Mathematics and after three years introductory implimentation of Gujarati Edition by the Gujarat State Board of School Textbooks.

Each chapter in the text-book is introduced with the titles : 'Let us recall', 'Let us learn Something new', 'Practice' and 'exercise'. The answers to the exercises are given at the end of each chatper. 'Revision' has been given at the end of every three or four chapters so that students may get practice.

The syllabus of this text-book is divided into two semesters. In first semester; 1st chapter contains the knowledge and place-value of numbers upto 1 crore. 2nd chapter includes the addition-subtraction of 6 digit numbers. Chapter-3 includes multiplication division of 3 or 4 digit numbers by 2 or 3 digit numbers. Chapter-4 shows properties of whole numbers and their representation on number-line. Chapter-5 includes divisibility test for 2, 3, 5 and 10. Chapter-6 shows factors and multiples of numbers less than 100 and concept of divisible and non-divisible numbers. Chapter-7 includes the area and perimeter of squares and rectangles using graph papers.

In second semester, chapter-8 shows the types of calculators and their usages. Chapter-9 includes the concept of average. Chapter-10 involves the construction of circle, inter-relation of radius and diameter and chord. Chapter-11 explains like and unlike fractions, addition of like fractions. Chapter-12 includes profit and loss. Chapter-13 shows the mathematical problems on the measurement of angles of the triangle and finally chapter-15 includes construction of angles using protector. Explanation is given by using pictures, figures, graph papers, puzzles, educational games, project-work and various activities.

It is hoped that the students, the teachers and the parents will like this text-book prepared for the students of standard V.

1 Numbers

- **Activity 1**

I am Esha. I often go to market to purchase household goods. Now, I know the cost of most of the items available in the market. Like me, you also might have gone to the market for shopping. Do you remember the cost of those items ? If yes, then list 10 such items and their costs in the following table.

Item	Cost	Item	Cost
Chocolate			

Activity 2 :

You might also have gone to the market with your father, mother or someone else. Haven't you ? Now form teams of three students each and discuss the cost of the items shown in the following pictures and write the approximate cost of each item in ☐ shown below each picture.

What do you say ?

- Which item has the lowest price ?
- Which item has the highest price ?
- Arrange the items of the above picture in the ascending order of their price.
- Arrange the items of the above picture in the descending order of their price.
- How many digits are there in the price of bicycle ?
- Which items are having the cost containing more than four digit numbers ?

Can you name some other items having the price containing more than four digit numbers ? Again, form the teams of three students each and make a list of such items. Let us see, which group makes the longest list.

Item	Approximate cost	Item	Approximate cost

You can read four digit numbers very well. Now read the following table and complete the blanks by reading the five digit, six digit and seven digit numbers.

Numbers	Ten lacs	Lacs	Ten Thou-sands	Thou-sands	Hun-dreds	Tens	Units	Read as
4,721				4	7	2	1	Four thousand seven hundred and twenty one
14,721			1	4	7	2	1	Fourteen thousand seven hundred and twenty one
27,607			2	7	6	0	7	Twenty seven thousand six hundred and seven
80,058			8	0	0	5	8	Eighty thousand and fifty eight
1,91,370		1	9	1	3	7	0	One lac ninety one thousand three hundred and seventy
2,48,425		2	4	8	4	2	5	Two lac forty eight thousand four hundred and twenty five
16,00,404	1	6	0	0	4	0	4	Sixteen lac four hundred and four
85,12,566	8	5	1	2	5	6	6	Eighty five lac twelve thousand five hundred and sixty six

The largest seven digit number is 99,99,999. By adding 1 to it, we get 1,00,00,000, which is read as one crore.

Now take a currency note of denomination ₹ 10 and read the number printed on it. Find such other numbers. Also note down the places where you see the numbers having more than four digits in your note book.

Practice 1

1. Using digits 1, 4, 7, 8 and 9 only, how many five digit numbers can you form in three minutes ? Note them down here :

2. Using the digits from 0 to 9, make seven digit numbers in 10 minutes only and list them here.

Numbers	Ten lacs	Lacs	Ten Thou-sands	Thou-sands	Hun-dreds	Tens	Units	Read as

Now compare your list with the list made by your friends and answer the following questions.

- Who made the maximum numbers ?

  .....

- Which number appeared in the list of more than one friend ?

  .....

- Which are the numbers greater than 50,00,000 in your list ?

  .....

- Which are the numbers having 7 in the hundredth place in your list ?

  .....

3. Make ten numbers using the given digits as follows. Also write them in words.

(1) 4, 5, 7, 8, 9 (2) 2, 4, 5, 6, 7, 8 (3) 1, 3, 4, 6, 7, 8, 0

*

- Have you onbserved advertisements in a newspaper ? Paste the cuttings of those advertisements of items having the cost of five, six or seven digits.

Form groups having six members each and distinguish the items found in the advertisements having the price in thousands and lacs.

- The items having the price in thousands :

  .....

- The items having the price in lacs :

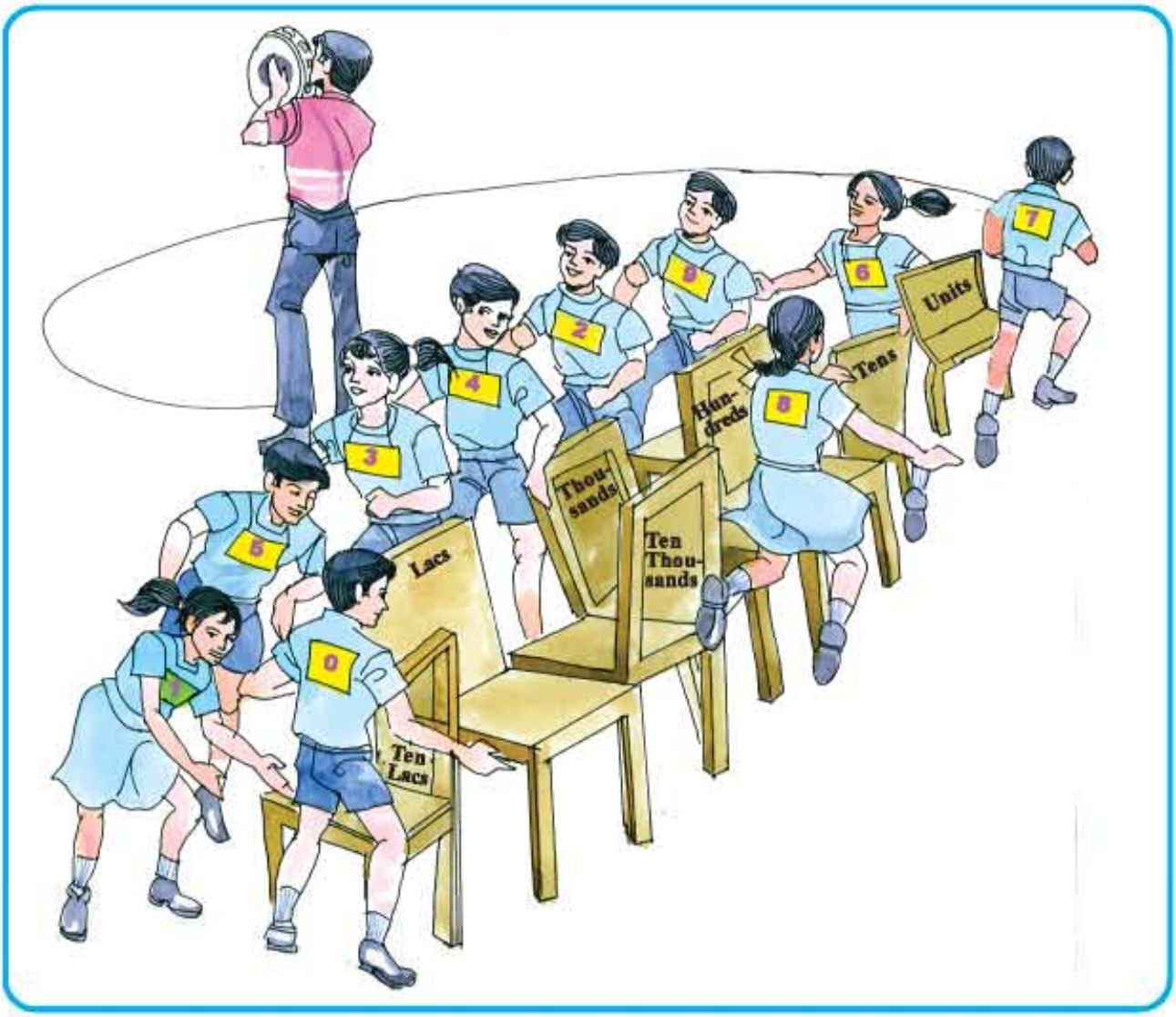
  .....

- The item having the lowest price and its price :
- The item having the highest price and its price :

Activity 3 : Musical Chair :

- We shall play this game in the groups of twenty each. For this we will take seven chairs naming them as units, tens, hundreds, thousands, ten thousands, lacs and ten lacs.
- Let us hang a card having a digit in our neck.
- As soon as the music stops, children will occupy the chairs. Now we will note down the number formed by their digit cards.

Let us start the game :



Ten lacs	Lacs	Ten thousands	Thousands	Hundreds	Tens	Units	Numbers	Read as

Place-value : If the number formed is 53,47,120, then find out which student having a digit of this number is seated in which chair ? Think and list.

Ten lacs	Lacs	Ten Thousands	Thou-sands	Hun-dreds	Tens	Units

Let us play again the game of Musical-Chair, but this time the place-value of each digit of the number obtained will be noted as illustrated below.

Numbers		10,00,000	1,00,000	10,000	1000	100	10	1
92,14,536	digit	9	2	1	4	5	3	6
	Place-value	90,00,000	2,00,000	10,000	4,000	500	30	6
	digit							
	Place-value							
	digit							
	Place-value							
	digit							
	Place-value							
	digit							
	Place-value							
	digit							
	Place-value							

- In 47,15,692 Place-value of 4 = 40,00,000
  Place-value of 7 = 7,00,000
  Place-value of 1 = 10,000
  Place-value of 5 = 5,000
  Place-value of 6 = 600
  Place-value of 9 = 90
  Place-value of 2 = 2
  Sum of Place-values of all digits = 47,15,692
- In 50,75,136 Place-value of 6 = 6
  Place-value of 3 = 30
  Place-value of 1 = 100
  Place-value of 5 = 5,000
  Place-value of 7 = 70,000
  Place-value of 0 = 0
  Place-value of 5 = 50,00,000
  Sum of Place-values of all digits = 50,75,136

Every digit has its own fixed value . But the digit in the number possesses its specific value according to the place of the digit. It is known as the place- value of the digit.

◆ **Activitiy 4 :**

Collect the census information of different sub-districts (Talukas) of your district and write the information based on it :

(1) Write the population of your sub-district in figures as well as in words.

....

(2) Write the population of your district in figures as well as in words.

....

(3) Name the sub-district having largest population. Also write the population in figures as well as in words.

....

(4) Name the sub-district having lowest population. Also write the population in figures as well as in words.

....

(5) Name the sub-district having largest female population. Also write the population in figures as well as in words.

....

Practice 2

1. Write place-value of the underlined digit :

Sr. No.	Numbers	Place-value of underlined digit
(1)	47,1<u>2</u>,451	2000
(2)	<u>7</u>,50,122	
(3)	66,66,<u>0</u>00	
(4)	72,37,6<u>1</u>5	

Sr. No.	Numbers	Place-value of underlined digit
(5)	1<u>2</u>,34,560	
(6)	<u>3</u>4,10,896	
(7)	57,91,1<u>2</u>3	
(8)	80,<u>8</u>0,008	

2.

Units ●	**Lacs** ● ●	**Hundreds** ● ● ●
Thousands ●	**Tens**	**Ten hundreds** ● ●

Take nine small pebbles and toss them on the above table. Make a number as per the number of pebbles lying on the places and write that number in words and state the place-value of each digit.

e.g., 2,21,301 Two lac twenty one thousand three hundred and one.

*

Exercise

1. Write the place-value of each digit of the following numbers.

(1) 60,12,894 (2) 91,20,159

(3) 68,12,442 (4) 70,00,528

(5) 56,76357

2. Make ten chits having the digit 0 to 9. Pick up any seven chits and form a seven digit number using the digits of the chits.

- Write the number obtained in words.
- Write the place-value of each digit of that number.

*

Practice 2

1. (2) 7,00,000 (3) 0 (4) 10 (5) 2,00,000 (6) 30,00,000

(7) 20 (8) 80,000

◆

2 Addition and Subtraction

❑ Let us play a game. A game of Number-Square :

- This game can be played by two to five players.
- A number-square is given below, Draw a large similar number-square in your note-book or on the floor and play this game.

900000	600000	200000
300000	100000	500000
800000	700000	400000

- A player will drop two erasers so that they fall on the number-square.
- Find the sum of the numbers on which the erasers fell. If the player gives correct answer, then player gets ten marks. Then the next player will follow the same. Repeat the process five times.
- The player who scores the highest number of marks will win the game. Now, what are you waiting for ? Start the game.
- Play this game for subtraction also.
- Who is the winner ? By how many marks ?

◆ Activity 1

- Prepare eighteen chits.
- Write the digit 1 to 9 in nine chits.
- Toss these chits and pick them up one after the other.
- Read the number on the chit and remember the value in lac.
- Write the names of nine students on the remaining nine chits.
- Now throw similar chits and pick them up one by one.
- Find the sum of the numbers found on your chit and your friend's chit.
- The student who gets the maximum addition is the winner.
- Play this game for subtraction also.
- What will you do to find the sum of the numbers of three friends ?

Practice 1

Add Orally :

(1) 300000 + 400000
(2) 200000 + 100000
(3) 100000 + 200000 + 300000
(4) 200000 + 400000 + 300000
(5) 800000 + 800000
(6) 120000 + 800000
(7) 700000 + 300000 + 3000

Subtract Orally :

(1) 400000 – 300000
(2) 600000 – 200000
(3) 700000 – 500000
(4) 900000 – 500000
(5) 100000 – 90000
(6) 250000 – 150000
(7) 550000 – 360000

*

❑ Addition :

◆ Activity 2 :

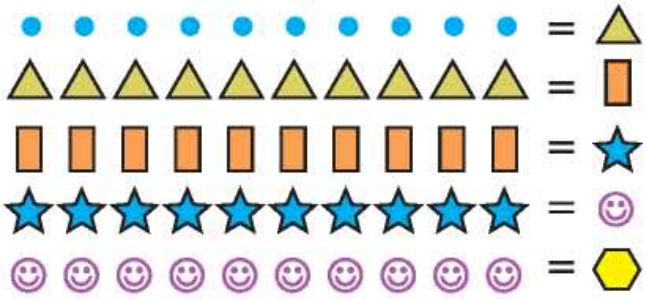
Form a five digit number by selecting any digits from 0 to 9.

e.g.,

Ten thousands	Thousands	Hundreds	Tens	Units
4	2	1	3	8

• Write the number by using the following shapes.

Units	●
Tens	△
Hundreds	▯
Thousands	★
Ten thousands	☺
Lacs	⬡



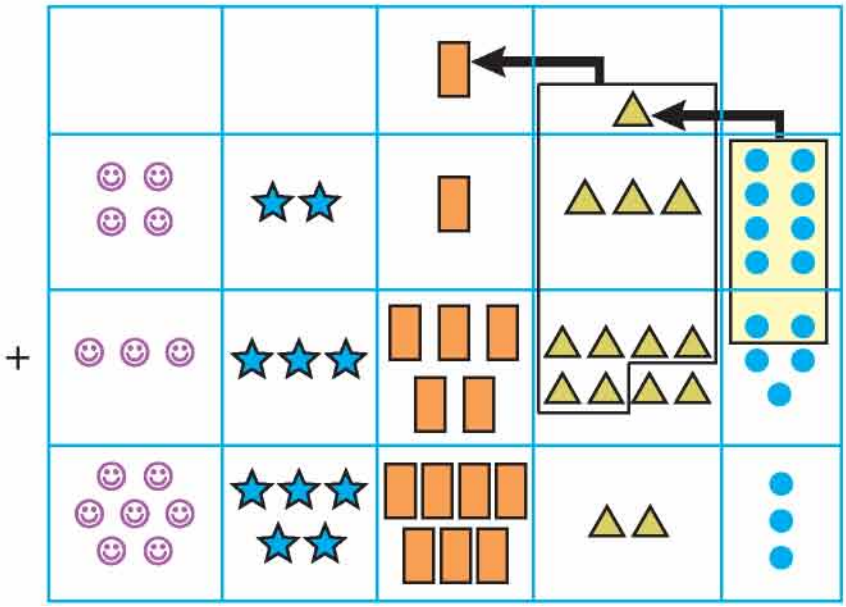
So, 42,138 can be shown as under :

Ten thousands	Thousands	Hundreds	Tens	Units
☺☺☺☺	★★	▯	△△△	●●●●●●●●

Ten thousands	Thousands	Hundreds	Tens	Units
☺☺☺	★★★	▮▮▮▮▮	△△△△ △△△△	●●● ●●

What is my value?

- **Let us do the addition of two numbers by using the shapes.**



$$\begin{array}{r} {\scriptstyle 1\ \ 1} \\ 42138 \\ +\ 33585 \\ \hline 75723 \end{array}$$

= 75723

- **Activity 3 : Answer the following studying the cash memo given below:**

Gujarat Traders, Bharatnagar

Name : Ramjibhai Date : 5-4-11 Tin No. : 25, Receipt No. : 288

Order	Item	Rupees
(1)	Cotton	1,28,780.00
(2)	Groundnut	2,31,835.00
(3)	Gram	32,632.00
(4)	Castor seeds	90,131.00
(5)	Sorghum *(Joowar)*	25,575.00
(6)	Millet	48,338.00
(7)	Sugarcane	3,75,950.00
	Total	**9,33,241.00**

Example 1 : What is the income of Ramjibhai from the sale of cotton and groundnut ?

Solution

			1	1	1			
	₹	1	2	8	7	8	0	income from cotton
+	₹	2	3	1	8	3	5	income from groundnut
	₹	3	6	0	6	1	5	Total income

Answer : Ramjibhai earned ₹ 3,60,615 from the sale of cotton and groundnut.

Answer the following :

(1) How much money (in rupees) did he earn from the sale of millet, castor and sorghum ?

(2) What is the income of Ramjibhai from the sale of sugarcane ?

(3) What is the income of Ramjibhai from the sale of gram and sugarcane ?

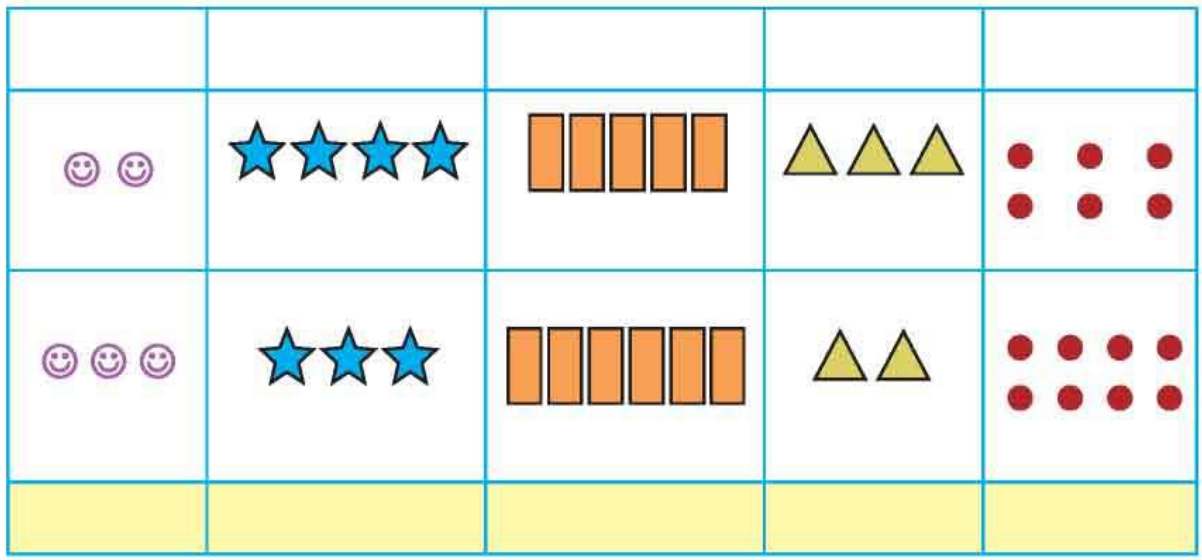
(4) How much did Ramjibhai earn from the sale of groundnut, gram and castor ?

(5) How much did Ramjibhai earn from sorghum, millet and gram ?

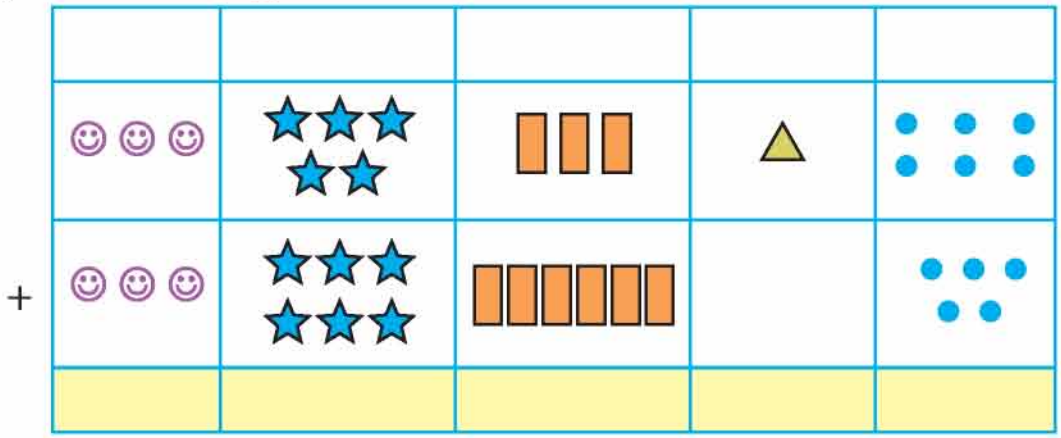
Practice 2

1. Add :

(1) Answer in shapes :



(2) Answer in digits :



2. Add :

(1) 348321 + 238435

(2) 73832 + 272669

(3) 789321 + 207762

(4) 632789 + 344806

(5) 623275 + 31363 + 21321

(6) 632784 + 213026 + 73013

(7) 800393 + 103907 + 6323

(8) 37632 + 133578 + 347010

3. 132783 + 732438

4. 732827 + 23289

*

❑ Subtraction

◆ Activity 4 :

Make six digit numbers from digits 0 to 9 in such a way that the digits of the number format are in increasing order from left to right.

e.g. 234567

- How many numbers can be formed ? Note down in your note-book.
- Select any two numbers from the above and subtract the smaller number from the larger one.
- Do such more subtractions. Note down your answers in your note-book. What do you observe ?

e.g.
234567
− 123456
111111

- Inter change last two digits and form new numbers from the six digit number. Select any two numbers from above and subtract the smaller number from the larger one.
  e.g. By interchanging last two digits of 456789, we get the number 456798.
- Form new numbers by interchanging the third and the fourth digits from the above numbers. Select any two numbers from these numbers and subtract the smaller number from the larger one.
- Make new numbers by interchanging first and last digits of the above six digits numbers. Select any two numbers from these numbers and subtract the smaller one from the larger one.

Practice 3

1. Subtract :

(1) 345782 − 123641	(2) 973286 − 532135	(3) 578603 − 432501	(4) 676385 − 430254
(5) 584326 − 114003	(6) 503479 − 201473	(7) 874356 − 533214	(8) 674325 − 100025
(9) 542389 − 30127	(10) 678483 − 5470	(11) 958687 − 583	(12) 675864 − 63253

*

◆ **Activity 5 :**

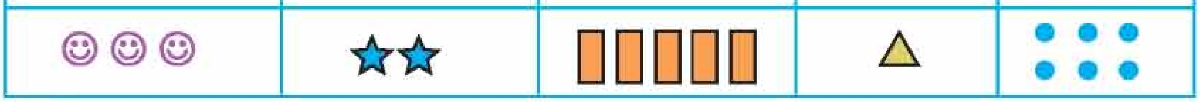
Write any five digits from 0 to 9 and make a five digit number.

◆ **Observe and Do :**

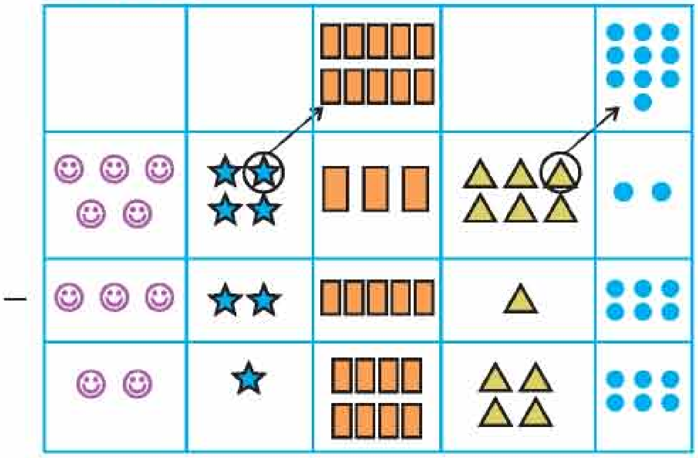
Ten thousands	Thousands	Hundreds	Tens	Units
☺☺☺ ☺☺	★★★★	▮▮▮	△△△ △△△	● ●

- **Subtract the shapes of numbers which is formed by you and your friend :**

Ten thousands	Thousands	Hundreds	Tens	Units



- **Subtract**



$$\begin{array}{r} \scriptstyle 3\ \ 10\ \ 5\ \ 10 \\ 5\ \not{4}\ 3\ \not{6}\ 2 \\ -\ 3\ 2\ 5\ 1\ 6 \\ \hline 2\ 1\ 8\ 4\ 6 \end{array}$$

= 21846

Example 1 : In a dairy, there were 5,75,680 pouches of Ghee in the month of January. During this month, other 4,08,525 pouches of Ghee were prepared. In the same month 8,87,750 pouches of Ghee were sold. How many pouches of Ghee were left unsold ?

Solution

5,75,680 Pouches were there initially	9,84,205 Total number of pouches
+ 4,08,525 Pouches prepared	− 8,87,750 Pouches sold
9,84,205 Pouches	0,96,455

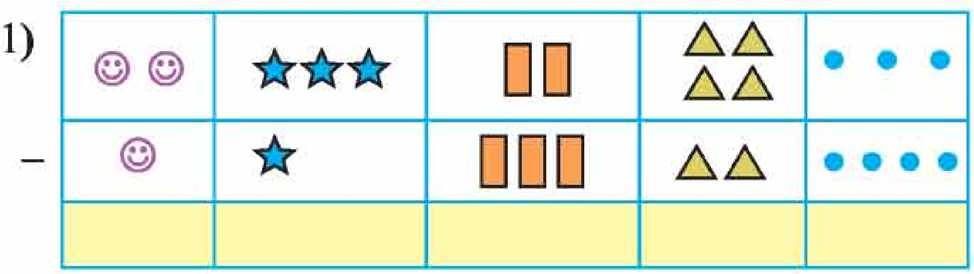
∴ 96,455 Pouches of Ghee lied unsold in store.

'∴' is a symbol for 'therefore'

Practice 4

1. Subtract :

(1)



(2)

☺ ☺ ☺	★★		△△△	• • •
– ☺	★★★	▮▮▮	△△	⁘

2. Subtract :

(1) 832343 − 743121

(2) 632413 − 312397

(3) 783930 − 365792

(4) 432079 − 431289

(5) 542389 − 32861

(6) 238789 − 7898

(7) 458930 − 7983

(8) 504882 − 2897

3. Observe the following pictures and discuss their values in the groups.

(1) Compare and discuss the cost of all vehicles with each other.

(2) Which vehicle has the highest cost and which has the lowest cost ? What is the difference between the two ?

(3) Which vehicle is costlier - Bus or Tractor ? Mention the difference in rupees.

(4) Prepare similar questions and discuss them with your friends.

(5) Which vehicle do you like and which vehicle does your friend like ? Whose vehicle is costlier ?

4. Answer the following questions by using the information of a factory preparing packets of biscuits :

Month	Mango Cream (Number of Packets)	Pineapple Cream (Number of Packets)	Orange Cream (Number of Packets)
January	138335	15723	123831
February	103813	123834	14338
March	16832	138389	155345
April	6320	183830	7892

(1) How many packets of biscuits were prepared in the month of January?
(2) How many packets of mango cream biscuits were prepared in the month of March and April ?
(3) In which month is the production of biscuits more – March or January ? Mention the difference.
(4) Which type of biscuits was produced more in April as compared to those in March ? Mention the difference.
(5) Compare the production of pineapple biscuits in the month of February and March. Mention the difference.
(6) Find out the production of biscuits in the month of February.

5. Observe the following passbook and fill in the blanks :

Date	Credit (₹)	Debit (₹)	Balance (₹)
01-01-2012	3845.00	—	3845.00
10-01-2012	103550.00	—	.....
15-01-2012	—	80550.00	.....
03-02-2012	157538.00	—	.....
05-02-2012	—	37675.00	.....
15-02-2012	235730.00	—	.....
20-02-2012	—	50000.00	.....
28-02-2012	150750.00	—	.....
29-02-2012	—	175000.00	.....

(Teacher should provide the necessary guidance.)

6. Take the District Information Book from your library and do as per your teacher's instruction.

Illustrative Questions :

(1) How much more is the population of your district as compared to your sub-district ?

(2) Which sub-district has more population, your sub-district or your neighbouring sub-district ? Mention the difference.

7. A father has divided his property among his two sons and a daughter. He gave a house worth ₹ 4,35,750 and a field worth ₹ 1,75,700 to his younger son. He gave the gold ornaments worth ₹ 3,80,550 and a plot worth ₹ 1,20,500 to his daughter and he gave a farm worth ₹ 2,50,775 and a house worth ₹ 2,55,800 to his elder son.

◆ **What do you say ?**

- Calculate the total worth of property that the younger son gets.
- Calculate the total worth of property that the elder son and the daughter get respectively.
- Among two sons, who got more property ? Mention the difference.
- What is the total cost of field and farm that the father has ?
- What is the total cost of both the houses that the father has ?

◆ **Play a Game :**

1	5	3	0
9	6	4	2
7	8	6	3
4	2	0	0
8	3	7	9

- Drop six pebbles on the number table.
- Make one largest six digit number by using the digits on which the pebbles have fallen. If any of the pebble does not fall on the number table, then the number must be formed only with the digits on which the pebbles fell.
- Ask your friend to prepare a similar number.
- Now, add and subtract your and your friend's numbers.

- Think, which digit will be there in place of ★.

1 2 3 4 5 ★	5 ★ 3 8 7	5 ★ 8 3 ★ 4
+ 3 4 0 ★ 3 5	+ 3 4 ★ ★ 9	− 1 9 ★ 1 5 ★
★ 6 ★ 9 ★ 5	★ 2 6 5 ★	★ 8 3 1 7 0

Exercise

1. Fill in the blanks by using appropriate alternative :

(1) 460000 + 275000 = ...

(a) 753000 (b) 735000 (c) 745000 (d) 754000

(2) 575035 + ... = 902282

(a) 327257 (b) 372274 (c) 327247 (d) 327267

(3) 6409*2 + 28764* = ...

(a) 928779 (b) 838879 (c) 928879 (d) 928579

(4) 370500 − 280575 = ...

(a) 89725 (b) 89952 (c) 89825 (d) 89925

(5) ..... − 452567 = 253510

(a) 706087 (b) 708087 (c) 706077 (d) 706057

2. Add :

(1)	(2)	(3)	(4)
345013	456781	324563	453009
+ 130018	+ 123999	+ 100098	+ 123798

3. Subtract :

(1)	(2)	(3)	(4)
343241	345321	432130	921110
− 118133	− 132137	− 111254	− 511028

4. On 'save water' day in a state, 7,32,680 children participated in a drawing competition. Among those 4,35,986 girls participated in this competition. How many boys participants were there in this event?

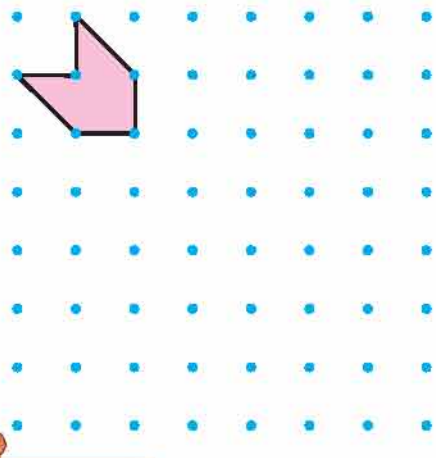
5. Purviben had ₹ 2,75,950. By selling a house, she got ₹ 3,55,600. She purchased a new house worth of ₹ 4,85,975 including all expenses. Now, how much money (in rupees) does she have ?

6. Seva trust had ₹ 7,95,980. From this it donated ₹ 1,85,000 to relief fund of the earthquake victims and spent ₹ 4,75,900 for the medical treatment of the injured. Now, how much money (in rupees) was left with the Seva trust ?

7. **Calculate the sums given below. Draw the shapes joining the dots to which the answer belongs and fill in the same colour given in the particular shape.**

E.g., 2,15,444 + 2,15,444 = 4,30,888

(1) 3508 + 5562
(2) 6535 + 2535
(3) 1,00,888 + 3,30,000
(4) 2,20,710 + 2,10,178
(5) 1,52,363 – 52364
(6) 10,315 – 1245
(7) 4,56,234 – 25,346
(8) 1,12,122 – 1,03,052



Practice 2

2. (1) 586756 (2) 346501 (3) 997083 (4) 977595 (5) 675959 (6) 918823 (7) 910623 (8) 518220

3. 865221 4. 756116

Practice 3

1. (1) 222141 (2) 441151 (3) 146102 (4) 246131 (5) 470323 (6) 302006 (7) 341142 (8) 574300 (9) 512262 (10) 673013 (11) 958104 (12) 612611

Practice 4

2. (1) 89222 (2) 320016 (3) 418138 (4) 790
(5) 509528 (6) 230891 (7) 450947 (8) 501985

4. (1) 277889 Packets (2) 23152 Packets (3) March, 32677 Packets
(4) Pineapple, 45441 Packets (5) March, 14555 Packets (6) 241985 Packets

Exercise

1. (1) b (2) c (3) d (4) d (5) c

2. (1) 475031 (2) 580780 (3) 424661 (4) 576807

3. (1) 225108 (2) 213184 (3) 320876 (4) 410082

4. 296694 **5.** ₹ 1,45,575 **6.** ₹ 1,35,080

◆

Let us know More :

- Addition and subtraction are processes opposite to each other.
- When a number is added to another number, this operation is called addition. "+" is the symbol of addition.
- When a smaller number is subtracted from a greater number, this operation is called subtraction. "–" is the symbol of subtraction.
- Addition and subtraction begin from unit place to tenth and similarly it continues with hundredth, thousandth....

3 Multiplication and Division

❑ Multiplication :

When I looked into my father's wallet, there were seven currency notes of ₹ 100 denomination, four currency notes of ₹ 50 denomination and eight currency notes of ₹ 5 denomination. My father asked me to count money and tell him the total amount in his wallet. I calculated as under and replied that there were ₹ 940 in it.

7 currency notes of ₹ 100 = ₹ 700
4 currency notes of ₹ 50 = ₹ 200
8 currency notes of ₹ 5 = ₹ 40

Total amount = ₹ 940

My father told me that it could be calculated in this way also.

$$\begin{array}{r} 100 \\ \times\ 7 \\ \hline 700 \end{array} + \begin{array}{r} 50 \\ \times\ 4 \\ \hline 200 \end{array} + \begin{array}{r} 5 \\ \times\ 8 \\ \hline 40 \end{array} = \begin{array}{r} 700 \\ +\ 200 \\ +\ 40 \\ \hline 940 \end{array}$$

❑ Let us Learn Something New :

Example 1 : Find : 1139×23

Solution :

$$\begin{array}{r} 1139 \\ \times\ 23 \\ \hline 22780 \\ +\ 3417 \\ \hline 26197 \end{array}$$

Explanation : $23 = 20 + 3$

$$\begin{array}{r} 1139 \\ \times\ 20 \\ \hline 22780 \end{array} \quad \begin{array}{r} 1139 \\ \times\ 3 \\ \hline 3417 \end{array} \quad \begin{array}{r} 22780 \\ +\ 3417 \\ \hline 26197 \end{array}$$

$\therefore\ 1139 \times 23 = 26197$

Example 2: Find : 1538×256

Solution :

$$\begin{array}{r} 1538 \\ \times\ 256 \\ \hline 307600 \\ +\ 76900 \\ +\ 9228 \\ \hline 393728 \end{array}$$

$\therefore\ 1538 \times 256 = 393728$

Practice 1

1. Multiply :

(1) $\begin{array}{r} 2382 \\ \times\ 13 \\ \hline \end{array}$ (2) $\begin{array}{r} 3473 \\ \times\ 15 \\ \hline \end{array}$ (3) $\begin{array}{r} 4739 \\ \times\ 28 \\ \hline \end{array}$ (4) $\begin{array}{r} 3356 \\ \times\ 25 \\ \hline \end{array}$ (5) $\begin{array}{r} 423 \\ \times\ 200 \\ \hline \end{array}$

(6)	(7)	(8)	(9)	(10)
5793 × 150	7390 × 109	3609 × 242	6237 × 115	2089 × 400

2. Select any three digits from the digits 0 to 9 and make all possible numbers of three digits. e.g. Taking 2, 5, 7 we can make six numbers like 257, 275, 752, 725, 527 and 572.

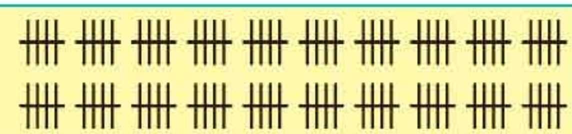
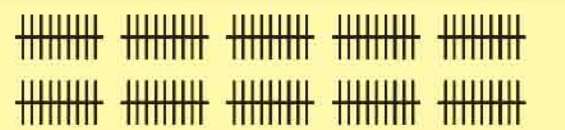
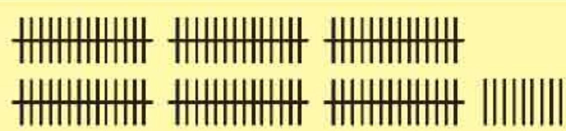
(1) Multiply any two numbers from the above.

(2) Similarly, make three other multiplications. Think the answer of other multiplications and determine which product will be a larger number and which will be a smaller number.

Division

Activity 1 :

There are hundred chocolates in the jar given below. Divide them as shown below :

Distributing 100 chocolates into groups of 5 each	
Distributing 100 chocolates into groups of 10 each	
How many chocolates will be left after distributing 100 chocolates into groups of 15 each ?	

Activity 2 :

Sit in a group of 5 students. Write the numbers 100, 200, 300.... in 10 chits. Fold the chits and place them in the centre of the group. A student will pick up a chit and will divide the number into five equal parts.

- Can the number given in the chit be divided into 10 equal parts ? Divide.
- Divide the number given in the chit in 20 equal parts.

Observe and Understand :

Example 3 : 1125 ÷ 25

```
      45
25 | 1125
   | 100
   |  125
      125
      000
```

$25 \times 1 = 25$, $25 \times 2 = 50$, $25 \times 3 = 75$,
$25 \times 4 = 100$, $25 \times 5 = 125$
(Thus, first it will be divided by 4 and then by 5)
Quotient = 45

Example 4 : 5213 ÷ 14

Division :

```
      372
   ------
14 | 5213
     42
   ------
     101
      98
   ------
       33
       28
   ------
        5
```

Table of 14

14 × 1 = 14
14 × 2 = 28
14 × 3 = 42
14 × 4 = 56 (Therefore, we divide by 3)
14 × 7 = 98
14 × 8 = 112 (Therefore, we divide by 7)
14 × 2 = 28 (Therefore, we divide by 2)

Quotient = 372, Remainder = 5

Practice 2

Divide :

(1) 4228 ÷ 14 (2) 5730 ÷ 15 (3) 6932 ÷ 17 (4) 8940 ÷ 19
(5) 3675 ÷ 21 (6) 7731 ÷ 25 (7) 9730 ÷ 20 (8) 6395 ÷ 32
(9) 7632 ÷ 45 (10) 9500 ÷ 50 (11) 8568 ÷ 24 (12) 9450 ÷ 35

- **Practical Examples :**

Activity 3 :

Report

Independence day was celebrated with great pomp and show in the School No. 2 in Rajkot. After flag-hoisting in the school compound, a cultural programme was presented by the students in which 15 students took part in 'Jai Somnath' song, 5 students took part in the patriotic song and 5 students took part in the ballet. The donor

Mohammadbhai gave a prize of ₹ 2000. Vimalaben gave ₹ 1000, the *Sarpanch* of the village gave ₹ 4500, and the association of friends of the village gave ₹ 500 as prize. The donor of the village Ramjibhai gave 109 slates to the students of standard one. The cost of each slate was ₹ 18. Denishbhai declared a prize of ₹ 100 to each participant and Avaniben declared a prize of ₹ 25 to each participant. The principal of the school thanked the donors and the programme ended.

Answers the questions given below on the basis of the report.

(1) How much money (in rupees) did Denishbhai give as the prize in total ?

Solution : If one child is awarded ₹ 100, then the amount given to 25 children = 100

$$\begin{array}{r} 100 \\ \times\ 25 \\ \hline 2000 \\ +\ 500 \\ \hline 2500 \end{array}$$

This multiplication can be done in this way also

$$25 \times 100 = 2500 \quad \text{OR}$$

$$\begin{array}{r} 25 \\ \times\ 100 \\ \hline 2500 \end{array}$$

(2) What amount did each student get after the prize awarded by the *Sarpanch* of the village was distributed equally among all the participants ?

Solution : Prize received from the *Sarpanch* = ₹ 4500, number of participants = 25

(To divide ₹ 4500 among 25 children = 4500 ÷ 25)

$$\begin{array}{r|l} & 180 \\ \hline 25 & 4500 \\ & 25 \\ \hline & 200 \\ & 200 \\ \hline & 0000 \end{array}$$

∴ **Each child gets ₹ 180**

(3) How much money (in rupees) did each participant get as a prize from Mohammadbhai?

(4) How much money (in rupees) did Avaniben declare as a prize ?

(5) If a pen is to be given to all the participants from the rupees given by the association of friends, then what will be the price of each pen ?

(6) What is the total cost of the slates given to the students of first standard by Ramjibhai ?

(7) How much donation has the school received in cash ? How much money (in rupees) did each participant get in total ?

Example 5 : A trader has 2520 apples. If 45 apples are stored in one box, then how many such boxes will be filled ?

Solution : There are 45 apples in one box, so in order to decide the number of boxes for 2520 apples, we have to divide 2520 by 45

```
      56
45 | 2520
     225
     ----
     0270
      270
     ----
      000
```

∴ **56 boxes will be filled.**

Practice 3

1. Study the following cash memo and answer the questions given below :

Bharat Provision Store

Name : Ghelabhai **Date :** 25-4-11 **Bill No.** 288

Details	*kg*	Rate (1 *kg*)	Amount (₹)
Wheat	?	26	3224
Millet	?	18	2700
Rice	?	38	9386
Corn	?	16	6000
Green gram	?	48	6576
Chick-pea dal	?	53	5883
		Total	**33769**

Cashier

(1) Find out how many *kg* of each commodity will be purchased ?

(2) If there is a rise of ₹ 2 per *kg* in the price of wheat, then how many *kg* of wheat can be purchased at the most for ₹ 3224 ? (Answer in complete *kg*).

(3) If there is a fall of ₹ 2 per *kg* in the price of rice, then how many maximum *kg* of rice can be purchased at the most for ₹ 9386 ? (Answer in complete *kg*)

2. 2430 students took part in a chess competition organised on the Children's Day. If each school has sent 18 students to take part in this competition, then how many schools have taken part in the competition ?
3. In a school ₹ 9450 were given for the scholarship. If it is distributed equally among 42 children, then how much money (in rupees) will each child get ?

Example 6 : According to the price list, how much cloth can Khushiben purchase within the limit of ₹ 5,000. (In complete metre)

	Details	Price/ 1 metre	Cloth available in ₹ 5000 (In complete metre)	Rupees remained
(1)	Cloth required for Cotton shirt	35	142	30
(2)	Cloth required for Cotton trouser	58	86	12
(3)	Jeans	80		
(4)	Chiffon dress	55		
(5)	Khadi	76		
(6)	Silk Cloth	68		
(7)	Terrycotton shirt	75		
(8)	Silk dress	85		

Solution : If the cloth worth ₹ 35 = 1 metre
so, the cloth worth ₹ 5000 = ?

```
   142
35 5000
   35
   150
   140
    100
     70
     30
```

Maximum 142 metre cloth can be purchased.

Solution : If the cloth worth ₹ 58 = 1 metre
So, the cloth worth ₹ 5000 = ?

```
   86
58 5000
   464
    360
    348
     12
```

Maximum 86 metre cloth can be purchased

- **Simplification of fundamental Operations :**

When we do two or more processes together, it should be done in this order : division, multiplication, addition and subtraction.

◆ **Simplify :**

Example 7 : $15 + 52 \div 13$

Solution : $15 + \underline{52 \div 13}$

$= 15 + 4 = 19$

Example 8 : $52 - 102 \div 17$

Solution : $52 - \underline{102 \div 17}$

$= 52 - 6 = 46$

Example 9 : $12 + 36 \div 6 \times 5$

Solution : $12 + \underline{36 \div 6} \times 5$

$= 12 + \underline{6 \times 5}$

$= 12 + 30 = 42$

Example 10 : $19 \times 3 - 72 \div 12$

Solution : $19 \times 3 - \underline{72 \div 12}$

$= \underline{19 \times 3} - 6$

$= 57 - 6 = 51$

Use the following procedure for Simplification :

- First of all take division and multiplication operation from left to right as it comes in a sequence.
- Lastly take addition and subtraction operation from left to right as it comes in a sequence.

e.g. (1) $8 \times 25 \div 5 - 16 + 30$

Here, going from left to right, we find multiplication first. So, we will perform multiplication first and then division.

$= \underline{200 \div 5} - 16 + 30$

$= 40 - 16 + 30$

Now, going from left to right, we find subtraction first. So, we will perform subtraction first and then addition.

$= 24 + 30 = 54$

(2) $35 - \underline{27 \div 9} + 2$

$= 35 - 3 + 2$ (Division first)

$= 32 + 2 = 34$

(3) $7 + \underline{6 \times 25} \div 3 + 13 - 20$

$= 7 + \underline{150 \div 3} + 13 - 20$

$= \underline{7 + 50 + 13} - 20$

$= 70 - 20 = 50$

Practice 4

Simplify :

(1) $8 + 10 \div 5 + 4$
(2) $4 \times 2 - 15 \div 5$
(3) $4 \times 25 \div 5 - 8$
(4) $49 \div 7 + 6 - 2$
(5) $9 \times 4 - 45 \div 15$
(6) $56 \div 8 + 8 \times 2$
(7) $35 - 27 \div 9 + 2$
(8) $8 \times 25 \div 5 - 16$
(9) $20 + 5 - 40 \div 4$

Activity 4 :

Observe the following pictures and write the price of the items in hundreds or in thousands and answer the following questions orally.





e.g. cost of a radio set is ₹ 600

Item	Radio set	Shoes	Chair	Cupboard	Clock
Approximate cost (₹)	600				

(1) What is the total cost of two radio sets ?

(2) What is the total cost of 20 cupboards ?

(3) What is the total cost of 40 radio sets ?

(4) What is the total cost of 50 clocks ?

(5) What is the total cost of five chairs ?

(6) What is the total cost of 25 pairs of shoes ?

Cost of two radio sets	600 + 600 1200	Number of radio sets = 2; so 600 × 2 1200	6 hundred × 2 = 12 hundred = 1200
Cost of five radio sets	600 + 600 + 600 + 600 + 600 3000	Number of radio sets = 5; so 600 × 5 3000	6 hundred × 5 = 30 hundred = 3000
Cost of fifteen radio sets	15 times addition of 600	Number of radio sets = 15; so 600 × 15 6000 (600 × 10) + 3000 (600 × 5) 9000	=..... =..... =.....

Practice 5

1. Multiply orally and fill in the blanks :

(1) 700 × 5 = ...	(2) 900 × 8 = ...	(3) 1000 × 27 = ...
(4) 800 × 7 = ...	(5) 300 × 50 = ...	(6) 500 × 19 = ...
(7) 200 × 15 = ...	(8) 400 × 90 = ...	(9) 700 × 60 = ...

Exercise

1. Fill in the blanks by selecting an appropriate option given below :

(1) 327 × 45 = ...

(a) 14745 (b) 14715 (c) 14475 (d) 14375

(2) 645 × ..... = 82560

(a) 118 (b) 138 (c) 128 (d) 132

(3) 9 – 65 ÷ 13 + 4 = ...

(a) 8 (b) 0 (c) 18 (d) 9

(4) If the cost of a clock is ₹ 115, then the total cost of 33 such clocks is ₹ .....

(a) 3759 (b) 3705 (c) 3785 (d) 3795

(5) There are 37 children going for a trip. The total contribution received for the trip is ₹ 23,125. So, each child must have contributed ₹ .....

(a) 625 (b) 635 (c) 615 (d) 605

2. If the cost of a bicycle is ₹ 1,575, then what is the cost of 83 such bicycles ?

3. If annual salary of Anitaben is ₹ 99,000, what is her monthly salary ?

4. If a box contains 48 soaps, then how many boxes will be required to contain 3,072 soaps ?

5. There are 1,280 families living in a village. Each family contributed ₹ 75 for the earthquake relief fund. If the total contribution is distributed among 48 families affected by earthquake, then how much money (in rupees) will each family get ?

6. **Simplify :**

(1) $15 + 32 \times 2$ (2) $6 \times 15 \div 3$ (3) $8 - 75 \div 15 + 2$ (4) $6 + 80 \div 16 - 8$

7. A trip of Saurashtra was organised by the school in a mini bus for 28 students and in a regular bus for 45 students. Each student contributed ₹ 500. During the trip, the expenses were : food bill ₹ 9,855, entry fees ₹ 3,285, mini bus charge ₹ 5,432, the regular bus charge ₹ 8,730 and boarding charge ₹ 6,132. Answer the following questions on the basis of given information :

(1) How much money (in rupees) was collected for the trip ?

(2) What was the entry fee for each student ?

(3) What was the food expense per student ?

(4) What was the bus charge per student ?

(5) What was the boarding charge per student ?

(6) Was there any money left in excess or was there a shortfall of it ? How much ?

(7) How much money (in rupees) will each student get as refund, if any ?

Answers

Practice 1

1. (1) 30,966 (2) 52,095 (3) 1,32,692 (4) 83,900 (5) 84,600
(6) 8,68,950 (7) 8,05,510 (8) 8,73,378 (9) 7,17,255 (10) 8,35,600

Practice 2

(1) Quotient : 302 (2) Quotient : 382 (3) Quotient : 407, Remainder : 13

(4) Quotient : 470, Remainder : 10 (5) Quotient : 175

(6) Quotient : 309, Remainder : 6 (7) Quotient : 486, Remainder : 10

(8) Quotient : 199, Remainder : 27 (9) Quotient : 169, Remainder : 27

(10) Quotient : 190 (11) Quotient : 357 (12) Quotient : 270

Practice 3

1. (1)

	Wheat	Millet	Rice	Corn	Green gram	Chick-pea gram
Kg.	124	150	247	375	137	111

(2) 115 kg (3) 260 kg **2.** 135 **3.** 225

Practice 4

(1) 14 (2) 5 (3) 12 (4) 11 (5) 33 (6) 23 (7) 34 (8) 24 (9) 15

Exercise

1. (1) 14715 (2) 128 (3) 8 (4) 3795 (5) 625

2. ₹ 1,30,725 **3.** ₹ 8,250 **4.** 64 **5.** 2000

6. (1) 79 (2) 30 (3) 5 (4) 3

7. (1) ₹ 36,500 (2) ₹ 45 (3) ₹ 135 (4) ₹ 194 (5) ₹ 84

(6) excess, ₹ 3,066 (7) ₹ 42

Fun with mathematics

1. Complete the product :

(1) $\begin{array}{r} 1738 \\ \times \quad \square \\ \hline 6952 \end{array}$ (2) $\begin{array}{r} 1963 \\ \times \quad \square \\ \hline \square 8 \square 2 \end{array}$ (3) $\begin{array}{r} 483 \\ \times \quad 1\square \\ \hline \square 69\square \end{array}$ (4) $\begin{array}{r} 157 \\ \times \quad 2\square \\ \hline 3\square\square 1 \end{array}$

2. To divide any number by 5 :

(1) $225 \div 5 = \frac{225 \times 2}{10}$

$= \frac{450}{10}$

$= 45$

(2) $625 \div 5 = \frac{625 \times 2}{10}$

$= \frac{1250}{10}$

$= 125$

3. To divide any number by 15 :

(1) $360 \div 15 = \frac{360 \times 2}{30}$

$= \frac{720}{30}$

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

(2) $750 \div 15 = \frac{750 \times 2}{30}$

$= \frac{1500}{30}$

$= \frac{150}{3} = 50$

Let us Know More

- Multiplication shows the number of repetitions of a particular number.
- Multiplication is a short form of a repetitive addition of a particular number.
- Multiplication is an operation of multiple and multiplier.
- Division is a repetitive of subtraction.
- Division is an operation of dividing a dividend by a divisor.
- Division and multiplication are reciprocal operations of each oter.

Revision : 1

1. Write the following numbers using digits.

(1) Twenty five thousand nine hundred and fifty four : .....

(2) One lac ninety thousand five hundred and eighty one : .....

(3) Four lac six thousand and ninety five : .....

(4) Twenty seven lac fifty nine thousand and sixty six : .....

(5) Sixty seven lac ninety four thousand and one : .....

(6) Twenty five lac eight thousand five hundred and nine : .....

(7) Seventy eight lac and four hundred : .....

(8) Fifty lac six thousand and seventy : .....

2. Write the following numbers in words :

(1) 40,751 : .....

(2) 3,25,666 : .....

(3) 8,78,814 : .....

(4) 7,01,609 : .....

(5) 35,00,042 : .....

(6) 91,91,119 : .....

(7) 59,50,077 : .....

(8) 84,07,550 : .....

3. Using each of the digits given below, make ten numbers and write them in words.

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

(3) 4, 5, 6, 7, 8 (4) 0, 2, 4, 5, 6, 8, 9

4. Add orally.

(1) 500000 + 200000 (2) 600000 + 300000

(3) 200000 + 100000 + 300000 (4) 600000 + 150000

(5) 200000 + 700000 (6) 800000 + 120000

(7) 100000 + 10000 + 1000 (8) 300000 + 130000 + 100000

5. Add :

(1) 324326 + 133438 (2) 435670 + 123630 (3) 873201 + 118669 (4) 783763 + 236574

(5) 183246 + 300781 (6) 378930 + 543090

6. Subtract :

(1) 643256 − 132132 (2) 693293 − 314391 (3) 824371 − 143888 (4) 943278 − 555278

7. The production of chocolates in a company is as follows . Answer the following questions based on it.

Month	Mango	Strawberry	Milk
January	1,53,245	5,43,200	6,43,834
February	2,33,423	3,74,308	5,40,000
March	3,43,231	1,13,201	2,34,300
April	3,43,113	1,23,401	1,73,631

Questions :

(1) What is the total production of mango chocolates and milk chocolates in the month of January ?

(2) What is the total production of strawberry chocolates in the month of January and February ?

(3) How much did the production of milk chocolates decrease in the month of March as compared to the production in February ?

(4) Find the total production of chocolates in the month of April ?

(5) Find the production of strawberry chocolates and milk chocolates in the month of March ?

8. Multiply orally :

(1) 100×2 (2) 600×3 (3) 400×8

(4) 300×10 (5) 1000×34 (6) 300×700

9. Multiply :

(1) 412×11 (2) 643×23 (3) 124×8 (4) 613×800 (5) 783×108

10. Divide orally :

(1) $100 \div 10$ (2) $100 \div 50$ (3) $100 \div 20$

(4) $500 \div 5$ (5) $800 \div 2$ (6) $1000 \div 25$

11. Divide :

(1) $13\overline{)3216}$ (2) $12\overline{)4326}$ (3) $17\overline{)6324}$ (4) $14\overline{)8304}$

12. Solve :

(1) If the rate of one metre cloth is ₹ 12, then how much cloth (in metre) will be purchased for ₹ 4320 ?

(2) If a box contains 50 packets of biscuits, then how many packets will be there in 1035 boxes ?

(3) There are 1,200 families in a village. Each family contributes ₹ 50 in village welfare programme. If the total expenditure is ₹ 48,335, then how much amount is left out ?

13. Solve :

(1) $15 + 32 \div 16 \times 20$ (2) $107 - 125 \div 25 + 39$

(3) $49 \div 7 \times 21 - 18$ (4) $18 \times 5 \div 15 - 6$

1. (1) 25,954 (2) 1,90,581 (3) 4,06,095 (4) 27,59,066
(5) 67,94,001 (6) 25,08,509 (7) 78,00,400 (8) 50,06,070

4. (1) 7,00,000 (2) 9,00,000 (3) 6,00,000 (4) 7,50,000
(5) 9,00,000 (6) 9,20,000 (7) 1,11,000 (8) 5,30,000

5. (1) 4,57,764 (2) 5,59,300 (3) 9,91,870 (4) 10,20,337
(5) 4,84,027 (6) 9,22,020

6. (1) 5,11,124 (2) 3,78,902 (3) 6,80,483 (4) 3,88,000

7. (1) 7,97,079 (2) 9,17,508 (3) 3,05,700 (4) 6,40,145
(5) 3,47,501

8. (1) 200 (2) 1800 (3) 3200 (4) 3000
(5) 34,000 (6) 2,10,000

9. (1) 4532 (2) 14,789 (3) 992 (4) 4,90,400 (5) 84,564

10. (1) 10 (2) 2 (3) 5 (4) 100 (5) 400 (6) 40

11. (1) Quotient : 247, Remainder : 5 (2) Quotient : 360, Remainder : 6
(3) Quotient : 372, Remainder : 0 (4) Quotient : 593, Remainder : 2

12. (1) 360 metre (2) 51,750 packets (3) ₹ 11,665

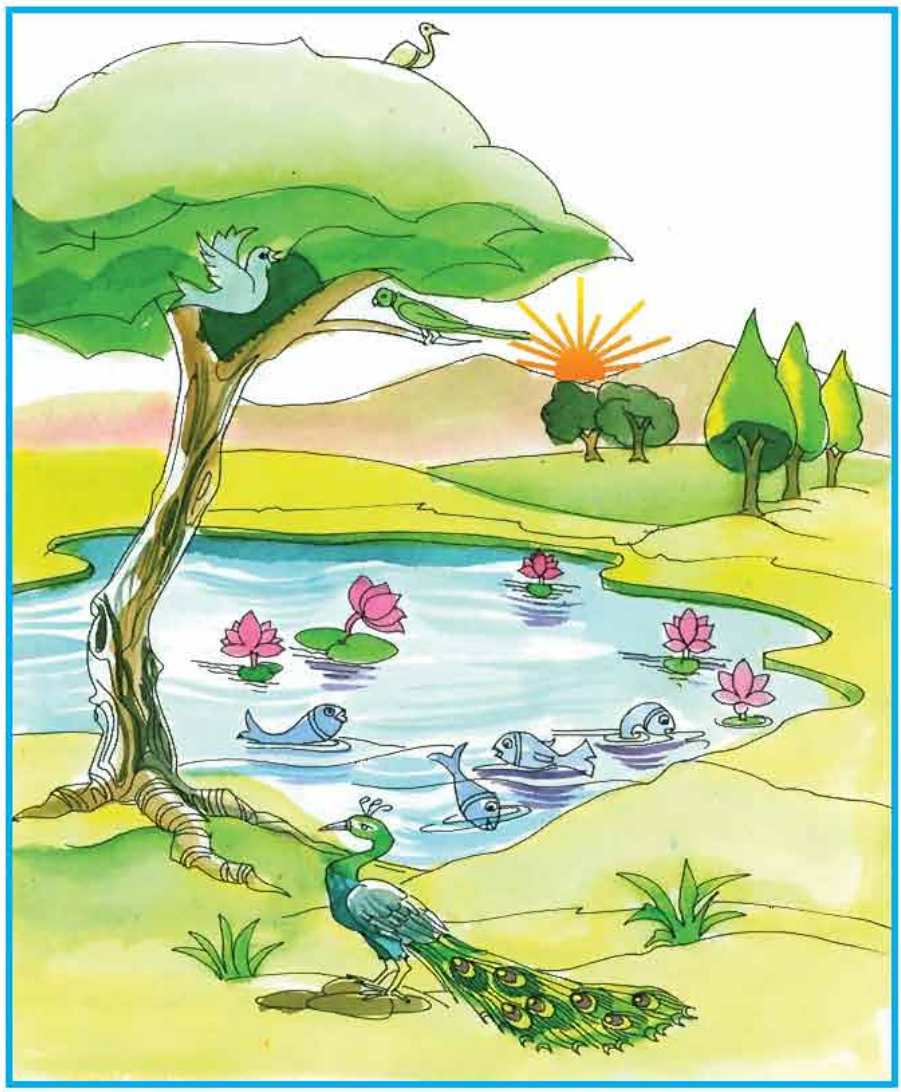
13. (1) 55 (2) 141 (3) 129 (4) 0

4 Whole Numbers

❑ Let us Learn Something New :

◆ Natural Numbers :

Observe the natural scene given below and answer the following questions :



(1) How many suns are there ? .....

(2) How many fish are there in the pond ? .....

(3) How many birds are there ? .....

(4) How many trees are there ? .....

Usually, we begin counting from 1. The numbers 1, 2, 3,... are the counting numbers. We get 2 by adding 1 to 1, we get 3 by adding 1 to 2, we get 4 by adding 1 to 3. Thus by adding 1 we get the next successive number.

Fill in the blanks :

10 + 1 = ...	125 + 1 = ...
123456 + 1 = ...	56487 + 1 = ...
248767 + 1 = ...	4876987 + 1 = ...

Thus adding 1 to any number, we get the next successive number. Hence the largest counting number does not exist. Counting numbers are endless (unlimited) in number. All these counting numbers are known as Natural numbers. **Natural numbers begin with 1 and they are endless in number.**

Natural numbers 1, 2, 3, 4,... are unlimited in number.

The smallest natural number is 1.

Note : In 1, 2, 3, 4,... the dots after 4 shows that these numbers are endless numbers (which is not mentioned)

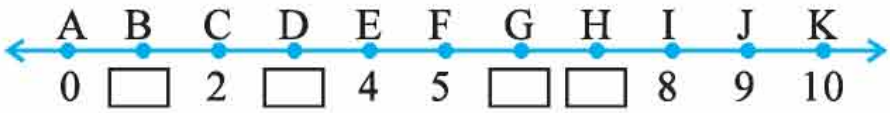
Whole Numbers :

We use zero as one of the numbers, though counting begins with 1. Hence zero is not included in natural numbers. Zero and natural numbers together make whole numbers. 0, 1, 2, 3,...are called whole numbers.

The smallest whole number is zero (0).

- **Representation of whole numbers on the number-line.**

The points A, B, C, D, E, F, G, H, I, J and K are plotted at unit distance on the line. Let us associate the smallest whole number 0 with point A on the line and numbers 1, 2, 3 etc with the points B, C, D etc. on the right side of 0 respectively. This is known as the representation of whole numbers on the line. Such line is known as number-line. Write the missing numbers on the following number-line.



A line is given here. Plot eight points at an equal distance on the line. Show eight consecutive whole numbers at these points.

Example 1 : Represent 0, 2, 6 and 10 on the number line.

Solution :

First of all draw a line.

Plot the points at equal distance.

Represent the numbers 0, 1, 2, 3,... on it.

Now, show the required points by encircling the numbers 0, 2, 6, and 10.

Practical 1

1. Answer the following questions :

(1) Which is the smallest natural number ?

(2) How many natural numbers are there ?

(3) Which is the smallest whole number ?

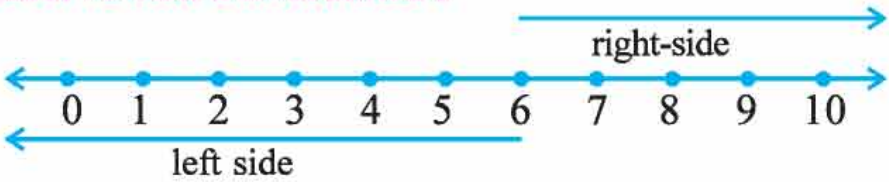
(4) From which number, the whole numbers begin ?

(5) How many whole numbers are there ?

2. Represent the numbers 1, 3, 5, 7 and 8 on number-line.

3. Represent the numbers 0, 4, 6 and 9 on number-line.

- **Observe and Understand :**



Here numbers 5, 4, 3, 2, 1, 0 are on the left side of 6, and they are smaller than 6. Likewise, numbers 7, 8, 9, 10,.... are on the right side of 6, and they are greater than 6.

Fill in the blanks :

(1) 1, 2, 3 are on .....side of 0.

(2) ....., ..., ... and ..... are the whole numbers on the left side of 4.

(3) The numbers on the left side of 4 are ..... than 4.

(4) The numbers on the right side of 5 are ..... than 5.

Practice 2

Answer the following questions based on the following number line.

(1) How many whole numbers are shown on the above number line ?

(2) Which whole numbers are less than 7 ? On which side of 7 are they lying ?

(3) On which side of 6 are whole numbers greater than 6 plotted ?

(4) On which side of 8 is 4 ?

(5) On which side of 8 is 9 ?

(6) Which whole numbers are there between 3 and 10 ?

- **Properties of Addition of Whole Numbers :**

(1) Observe, Understand and Complete :

5	+	4	=	9	
Whole number		Whole number		Whole number	
8	+	9	=	17	
Whole number		Whole number		Whole number	
.....	+	6	=	15	
Whole number		Whole number		Whole number	
12	+	13	=	.....	
Whole number		Whole number		Whole number	

We observed in above table that **the sum of any two whole numbers is a whole number.**

(2) Observe, Understand and Complete :

4 + 5 = ...	5 + 4 = 9
3 + 7 = 10	7 + 3 = ...
8 + ... = 14	6 + 8 = ...
9 + 10 = ...	..... + 9 = 19

$\therefore$ 4 + 5 = 5 + 4

We observed from above table that **any two whole numbers added in any order give the same result. This property is known as commutative property of Addition.**

(3) Observe, Understand and Complete :

(3 + 6) + 7	**OR**	3 + (6 + 7)
= 9 + 7		= 3 + 13
= 16		= 16
$\therefore$ (3 + 6) + 7		= 3 + (6 + 7)

Complete as done above.

(10 + 15) + 12	**OR**	10 + (15 + 12)
= (25) + ...		= 10 + (.....)
= 37		= 37

Select three numbers in any order. If the first number is added to the sum of the second and third number or if the sum of first and second number is added to the third number, the results are the same.

(4) Observe, Understand and Complete :

7 + 0 = 7
8 + 0 = ...
..... + 9 = 9
0 + ... = 16

Addition of any whole number to zero gives the same whole number. Thus **0 is an 'Identity Element' for Addition.**

0 is also called additive identity.

• Properties of Whole Numbers for Multiplication :

(1) Observe, Understand and Complete :

5 Whole number	×	4 Whole number	=	20 Whole number
8 Whole number	×	9 Whole number	=	72 Whole number
..... Whole number	×	6 Whole number	=	42 Whole number
10 Whole number	×	13 Whole number	=	..... Whole number

We observed from the above table that **the product of any two whole numbers is a whole number.**

(2) Observe, Understand and Complete :

4 × 5 = ...	5 × 4 = 20
3 × 7 = ...	7 × 3 = 21
8 × ..... = 48	6 × 8 = ...
9 × 10 = ...	..... × ..... = ...

∴ 4 × 5 = 5 × 4

We observed from the above table that **the product of any two whole numbers in any order gives the same result. This is known as Commutative Property for Multiplication.**

(3) Observe, Understand and Complete :

$(3 \times 6) \times 7$	**OR**	$3 \times (6 \times 7)$
$= 18 \times 7$		$= 3 \times 42$
$= 126$		$= 126$
$\therefore (3 \times 6) \times 7$		$= 3 \times (6 \times 7)$

Complete as above :

$(10 \times 15) \times 12$	**OR**	$10 \times (15 \times 12)$
$= 150 \times$		$= 10 \times$ .....
$= 1800$		$= 1800$

Thus, **Select three numbers in any order. If the product of the second and the third number is multiplied by the first number or the product of the first and the second number multiplies the third number, the results are the same.**

(4) Observe, Understand and Complete :

$7 \times 1 = 7$
$8 \times 1 =$ .....
$1 \times 9 = 9$
$1 \times$ ..... $= 16$

Multiplying any whole number with 1 gives the same number. Thus,

1 is an 'Identity Element' for Multiplication.

Distribution of Multiplication over the Addition for whole Numbers :

$4 \times (3 + 2)$	$4 \times (3 + 2)$
$= 4 \times 5$	$= (4 \times 3) + (4 \times 2)$
$= 20$	$= 12 + 8$
	$= 20$

$\therefore$ $4 \times (3 + 2) = (4 \times 3) + (4 \times 2)$

Thus, the distribution of multiplication over addition is possible. Is the distribution of addition over multiplication possible ? Verify.

Practice 3

Fill in the blanks :

(1) $15 \times 12 = 12 \times$ .....

(2) $(4 + 6) + 5 = 4 + (6 +$ .....$)$

(3) $12 \times (8 \times 9) =$ (..... $\times 8) \times 9$

(4) $7 +$ ..... $= 7$ or $7 \times 1 =$ .....

(5) $6 \times (7 + 8) = (6 \times$ .....$) + (6 \times$ .....$)$

(6) $25 \times 13 = 13 \times$ .....

(7) $(14 + 16) + 10 = 14 + (16 +$ .....$)$

(8) $24 \times (12 \times 13) =$ (..... $\times 12) \times 13$

(9) ..... $+ 12 = 12$

(10) $12 \times (10 + 12) = (12 \times$ .....$) + (12 \times$ .....$)$

What have we learnt ?

- Whole numbers : 0, 1, 2, 3,...
- Zero is the smallest whole number.
- Among the two whole numbers on the number-line, the number on the right side is greater than the number on the left side.
- 0 (zero) is the identity element for addition.
- 1 (one) is the identity element for multiplication.
- The result obtained is the same for addition as well as multiplication of two whole numbers done in any order.
- Select three numbers in any order. If the first number is added to the sum of the second and third number or if the third number is added to the sum of first and second number the results are the same.
- Select three numbers in any order. If the product of the second and the third number is multiplies the first number or the product the first and the second number is multiplied by the third number, the results are the same.
- Distribution of multiplication over addition is possible, but the distribution of addition over multiplication is not possible.

Exercise

1. Represent numbers between 1 and 10 on the number-line.
2. **Answer the following :**
   (1) On which side of 9 is 5 ?
   (2) On which side of 7 is 10 ?
   (3) Which is the identity element for addition of whole numbers ?
   (4) Which is the identity element for multiplication of whole numbers ?
3. **Fill in the blanks :**
   (1) $15 \times 25 =$ ..... $\times 15$
   (2) $40 + 24 =$ ..... $+ 40$
   (3) $13 + (14 +$ .....$) = (13 + 14) + 16$
   (4) $12 \times (3 \times 7) = (12 \times$ .....$) \times 7$
   (5) ..... $\times (12 + 13) = (10 \times 12) + (10 \times 13)$

Practice 1

(1) 1 (2) endless (3) 0 (4) 0 (5) endless

Practice 2

(1) 11 (2) 0, 1, 2, 3, 4, 5, 6 - on left side (3) on right side
(4) on left side (5) on right side (6) 4, 5, 6, 7, 8, 9

Practice 3

(1) 15 (2) 5 (3) 12 (4) 0, 7 (5) 7, 8
(6) 25 (7) 10 (8) 24 (9) 0 (10) 10, 12

Exercise

2. (1) On left side (2) on right side (3) 0 (4) 1
3. (1) 25 (2) 24 (3) 16 (4) 3 (5) 10

5 Divisibility Tests

❑ Let us Learn Something New :

Test for divisibility by 2

◆ Activity 1 :

Hello children, let us play a game today. Do you want to play ? Let us get divided in two teams. First of all, members of both the teams will make festooneries (*Torans*) in which flowers will be replaced by coloured papers. Make 100 pieces of papers of any shape and write numbers 1 to 100 on consecutive papers. Now place these number cards prepared in front of two teams and the members of both the teams occupy their respective places. Let us keep a string ready to prepare a festoonery of numbers. One team will prepare a festoonery of cards containing numbers divisible by 2 without leaving remainder. The other team will prepare a festoonery of cards containing numbers not divisible by 2. Let us see, which team will insert maximum number of cards in 10 minutes. Write down the numbers you have inserted in the following table.

Name of Winning Team :

The festoonery containing numbers divisible by 2 without leaving remainder		The festoonery containing numbers not divisible by 2	
Which numbers are observed ?	Unit digit of that number	Which numbers are observed ?	Unit digit of that number

◆ **Think : What conclusion is derived ?**

- Let us understand the details from the following table prepared.

$$\begin{array}{r} 5 \\ 2\overline{)11} \\ 10 \\ \hline 01 \end{array} \quad \begin{array}{r} 6 \\ 2\overline{)12} \\ 12 \\ \hline 00 \end{array} \quad \begin{array}{r} 6 \\ 2\overline{)13} \\ 12 \\ \hline 01 \end{array} \quad \begin{array}{r} 7 \\ 2\overline{)14} \\ 14 \\ \hline 00 \end{array} \quad \begin{array}{r} 7 \\ 2\overline{)15} \\ 14 \\ \hline 01 \end{array}$$

$$\begin{array}{r} 8 \\ 2\overline{)16} \\ 16 \\ \hline 00 \end{array} \quad \begin{array}{r} 8 \\ 2\overline{)17} \\ 16 \\ \hline 01 \end{array} \quad \begin{array}{r} 9 \\ 2\overline{)18} \\ 18 \\ \hline 00 \end{array} \quad \begin{array}{r} 9 \\ 2\overline{)19} \\ 18 \\ \hline 01 \end{array} \quad \begin{array}{r} 10 \\ 2\overline{)20} \\ 20 \\ \hline 00 \end{array}$$

Only those numbers which have last digit 2 or 4 or 6 or 8 or 0 are divisible by 2, without leaving remainder. Such numbers are said to be divisible by 2.

◆ **Activity 2 :**

In the following table colour the boxes containing numbers, not divisible by 2 :

48	393	324	721	6002	2468	8403	8641
56	1700	175	2607	2982	690	1752	38
5656	6688	755	50	190	187	177	2424
7	9999	149	808	98	70	4591	2223	1
1774	86	78	4441	8043	754	777	655
5	2465	2798	681	1071	566	6710	9732	68

❑ **Test for divisibility by 5 :**

◆ **Activity 3 :**

Let us play another relay game :

- Divide all members in groups of two each.
- One player of each team will bring a card containing a number divisible by 5 without leaving remainder from a dish lying in front of them that contains number cards from 1 to 100.

- With the help of a teacher the second player will test the card brought by the first player and stick on the chart-sheet. Every team will get 5 minutes.
- Let us start the game.
- Which team won ?
- How did you decide that the number is divisible by 5 without leaving remainder ?

Numbers Divisible by 5 without leaving remainder	Unit digit of the number

◆ **Activity 4 :**

Let us repeat the above mentioned activity. But this time the dish contains some numbers from 1 to 10,00,000. See which team wins ?

Only those numbers whose unit digits are 5 or 0 are divisible by 5 without leaving remainder. Such numbers are said to be divisible by 5.

◆ **Activity 5 :**

Prepare a festoonery of 15 numbers divisible by 5 and hang it in your class room.

❑ **Divisibility key for 10 :**

◆ **Activity 6 :**

Just as above, play a relay game for numbers divisible by 10 without leaving remainder and make a note in the following table :

Numbers divisible by 10 without leaving remainder	Unit digit of the number

Only the numbers having unit digit 0 are divisible by 10 without leaving remainder. Such numbers are said to be divisible by 10.

- **Activity 7 :**

Prepare a festoonery of 15 numbers divisible by 10 and hang it in your class.

Practice 1

1. State whether the following numbers are divisible by 2 or 5 or 10 and mark it as ✓ or ×

Number	By 2	By 5	By 10	By all the three
728				
135				
1797				
9880				
6574				
8700				
6565				
5551				

- **Test of divisibility by 3**

There is a company manufacturing rickshaws. In front of its gate, several trucks have come, loaded with tyres for rickshaws. The number on the truck shows the number of tyres it contains.

- Divide the number shown on each truck by 3. What do you observe ?

◆ **Let us understand :**

Number of tyres	Sum of the digits of Number of tyres	Is the sum divisible by 3 ?
1203	1 + 2 + 0 + 3 = 6	Yes
1103	1 + 1 + 0 + 3 = 5	No
982		
1690		
888		
1163		
963		
1416		
1380		

Only the numbers having the sum of digits which is divisible by 3 without leaving remainder are themselves divisible by 3 without leaving remainder. Such numbers are said to be divisible by 3.

Practice Exercise 2

1. In the following diagram mark the truck with ✓ if the number on it is divisible by 3 :

2. Colour the box in the following, if it contains a number not divisible by 3.

11232	81088	44444	13333	93630
4981	13410	6083	4542	84842
4264	8660	1781	7682	691
11302	7662	3331	66783	71200
4335	5441	1116	14411	71202

3. Mark the following numbers using ✓ or × if they are divisible by 2, 3, 5 or 10.

Numbers	By 2	By 3	By 5	By 10
345				
220				
1344				
9175				
17910				
6543				
55509				
41445				

Activity 8 :

- Two to four friends can play following game simultaneously. First of all write 4, 5, or 6 digit numbers in boxes.
- Each player decides some pebbles.
- Make your cubical eraser a dice. It has six faces. Write 2 on any two of its faces, 3 on any two of remaining faces and 5 on remaining faces.

- As per turn, a player tosses the dice. The player should place a pebble on one of the numbers on the table divisible by the number obtained on the face. When all the boxes are filled in; the player, with maximum number of pebbles lying on boxes, is the winner.

Exercise

1. Classify following numbers into those divisible by 2, 3, 5 or 10.

(1) 724 (2) 625 (3) 300 (4) 669

(5) 2163 (6) 600 (7) 816 (8) 1575

Answers

Exercise

1. **Divisible by 2** : 724, 300, 600, 816
   Divisible by 3 : 300, 669, 2163, 600, 816, 1575
   Divisible by 5 : 625, 300, 600, 1575
   Divisible by 10 : 300, 600

◆

A game :

Play following game using tests of divisibility by 2, 3, 5 or 10.

Start

Start →									
	22	123	50	25	42	142	56	10	1346
	15	2	5	83	94	1000	603	30	6
	63	1016	300	435	763	9432	9401	105	1011
	65	932	305	97	650	36	700	9	3240
	60	34	135	8732		730	18	648	25
	30	70	49	35	81	648	25	1349	68
	82	55	100	7321	1310	339	630	800	1008
	45	1543	1435	6432	1233	222	300	57	755
	32	88	1782	57	612	530	155	685	1092 ← Start

Start

- On any four faces of a die write 2, 5, 10 and 3.
- Toss the die. Using the divisibility test of the number by that digit obtained on the die, place a pebble on the first number divisible by that digit in your direction.
- The person who reaches the cup first is the winner.

6 Factors and Multiples

❑ Let us Learn Something New :

◆ Activity 1 :

Some friends come to your home. Tick (✓) against the number which shows you can give equal number of biscuits without breaking and put a (×) against the number which shows you cannot give equal number of biscuits.

Number of biscuits	1 friend	2 friends	3 friends	4 friends	5 friends	6 friends	7 friends	8 friends
6 biscuits								
8 biscuits								

Discussion : Discuss the following questions amongst your friends :

- Among how many friends, can you distribute 6 biscuits in equal numbers ?
- Among how many friends, can you distribute 8 biscuits in equal numbers ?
- Among how many friends can you not distribute 8 biscuits in equal numbers ?
- How did you decide?

◆ Complete the following table :

×	1	2	3	4	5	6	7	8	9	10
1	1	2	3				7			
2	2	4	6						18	
3	3	6	9			18				
4		8			20				36	
5										
6				24			42			60
7			21							
8		16							72	
9	9									
10										100

◆ Activity 2 :

Using tables of multiplication and tests for divisibility, put a ✓ against the number divisible by numbers given in the top row.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
9	✓		✓						✓											
10																				
12	✓	✓	✓	✓		✓						✓								
5																				
14																				
17																				
15																				
18																				
20																				

In the above table 12 is divisible by 1, 2, 3, 4, 6 and 12. Hence 1, 2, 3, 4, 6 and 12 are factors of 12.

Number	Factors
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	

Number	Factors
11	
12	
13	
14	
15	
16	
17	
18	
19	
20	

- How did we get the factors ?
- How many factors of 4 did we get ?
- How many factors of 7 did we get ?
- Did we get minimum number of factors ?
- Which is the smallest factor of any number ?
- Which is the largest factor of any number ?

Write down the factors of the given numbers in the following table :

25	
30	
36	

See and understand :

Example 1 : Write the factors of 28:

Solution :

$1 \times 28 = 28$
$2 \times 14 = 28$ (test of divisibility by 2)
$4 \times 7 = 28$

The factors of 28 are :
1, 2, 4, 7, 14 and 28

Example 2 : State the factors of 42:

Solution :

$1 \times 42 = 42$
$2 \times 21 = 42$
$3 \times 14 = 42$
$6 \times 7 = 42$

The factors of 42 are :
1, 2, 3, 6, 7, 14, 21 and 42

Example 3 : State the factors of 75

Solution :

$1 \times 75 = 75$
$3 \times 25 = 75$ (test of divisibility by 3)
$5 \times 15 = 75$ (test of divisibility by 5)

The factors of 75 are : 1, 3, 5, 15, 25 and 75

Factor : The number by which a given number is divisible leaving no remainder is called a factor of the given number.

- **Every number other than 1 has at least two factors, 1 and the number itself.**
- **1 is the smallest factor of every number.**
- **Every number is the largest factor of itself.**

Practice 1

State the factors of following numbers :

(1) 23 (2) 25 (3) 30 (4) 35 (5) 48

(6) 49 (7) 55 (8) 60 (9) 85 (10) 100

Prepare a table of factors of numbers from 1 to 20. Divide numbers into three groups as follows and discuss the following questions in a group of three :

Numbers with only one factor	Numbers with exactly two factors	Numbers with more than 2 factors

- Which number has the minimum number of factors ?
- Which numbers have more than two factors ?
- Which numbers have exactly two factors ?

Distribute numbers from 21 to 50 in three groups as follows :

Numbers with only one factor	Numbers having exactly two factors	Numbers having more than 2 factors

◆ **Prime Numbers :**

- The numbers having exactly two factors are called prime numbers, as for example 2, 3, 5, ☐, ☐, ☐ etc.
- A prime number has two factors namely 1 and the number itself.
- The smallest prime number is 2, which is the only even prime number.

◆ Composite Numbers :

- The numbers having more than two factors are called **composite numbers** as for example 4, 6, 8, ☐, ☐, ☐ etc.
- The smallest composite number is 4.
- 1 has only one factor. Hence, 1 is not included amongst prime numbers or composite numbers. Hence, 1 is a special number.

Practice 2

1. Put a ◯ around prime numbers :

(1) 52, 55, 53 (2) 90, 81, 97 (3) 63, 73, 74

(4) 38, 41, 49 (5) 67, 75, 84 (6) 78, 89, 98

2. Find all prime numbers between 20 to 50.

❑ Method to find prime factors by the method of multiplication :

◆ Activity 3 :

We have seen earlier that factors of 12 are 1, 2, 3, 4, 6 and 12.

We can write 12 as a product of two factors in three ways :

(1) $12 = 1 \times 12$

(2) $12 = 2 \times 6$

(3) $12 = 3 \times 4$

Sit in a group of four and find how many ways you can write the following numbers as a product of two numbers and discuss :

(1) 15 (2) 18 (3) 20 (4) 25 (5) 21 (6) 77

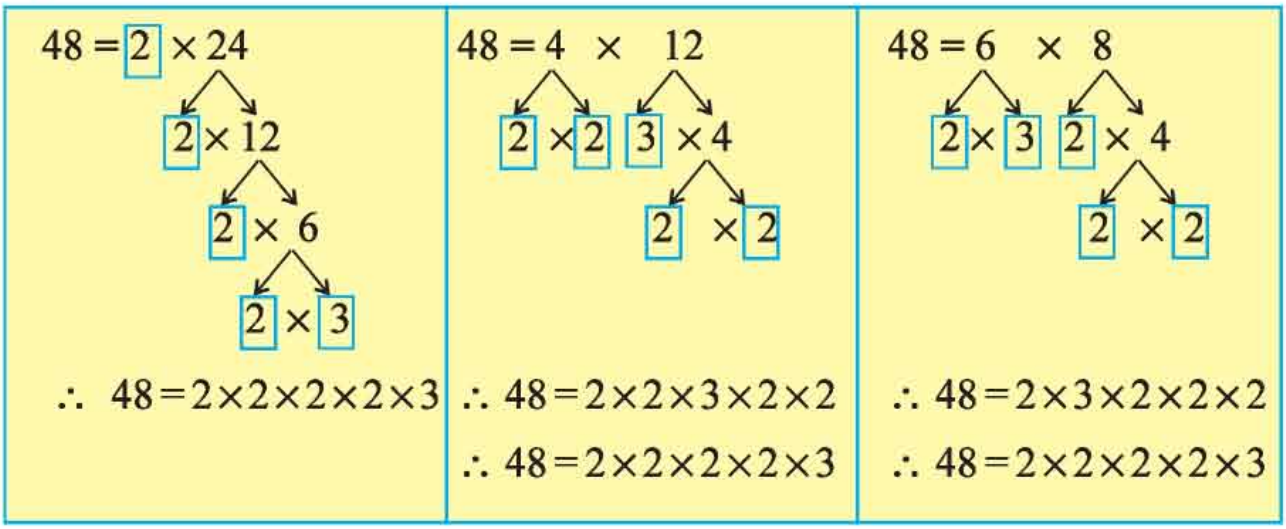
Discussion :

- In how many ways can you express 20 as a product of two factors ?
- In how many ways can you express 15 as a product of two factors ?
- In the expression of 15 as $15 = 3 \times 5$, both the factors are prime. Give numbers other than 15, which have both prime factors.
- Which other numbers between 1 to 30 can be expressed as a product of two primes ?
- The numbers 2, 3, 5, 7,...97 between 1 to 100 are themselves prime numbers. Hence no question arises of their factorisation in prime numbers.
- We expressed some numbers between 1 to 30 as a product of prime numbers. There are other numbers also which can be expressed as a product of prime numbers but this factorisation contains more than two prime numbers. Let us take an example.

Example 4 : Factorise 18 into primes.

$18 = 18 \times 1$ Here 1 is neither a prime nor a composite number. Hence we will not consider product with 1 in such calculations.	$18 = \boxed{2} \times 9$ Here 2 is a prime. But 9 is a composite number. Hence expressing 9 as a product of primes. $18 = \boxed{2} \times 9$ $\boxed{3} \times \boxed{3}$ $18 = 2 \times 3 \times 3$	$18 = \boxed{3} \times 6$ Here 3 is a prime. But 6 is composite. Hence expressing 6 as a product of primes. $18 = \boxed{3} \times 6$ $\boxed{2} \times \boxed{3}$ $18 = 3 \times 2 \times 3$ $18 = 2 \times 3 \times 3$

Example 5 : Factorise 48 into prime numbers.



Practice 3

Factorise the following numbers into prime numbers using the method of multiplication :

(1) 20 (2) 28 (3) 32 (4) 36 (5) 40 (6) 56 (7) 80 (8) 81

- **Method of obtaining prime factors using division :**

Example 6 : Factorise 12 into prime numbers.

Solution :

2	12
2	6
3	3
	1

$12 = 2 \times 2 \times 3$

Example 7 : Factorise 60 into prime numbers.

Solution :

2	60
2	30
3	15
5	5
	1

$60 = 2 \times 2 \times 3 \times 5$

Practice 4

Factorise the following numbers into prime numbers using division :

(1) 24 (2) 30 (3) 36 (4) 45 (5) 50 (6) 54 (7) 64 (8) 88

◆ Activity 4 :

You wish to give biscuits in equal numbers to two friends who visited your house. You have got several biscuits. How many biscuits should be with you so that you can distribute all the biscuits to both of them in equal numbers ?

- How many biscuits can equally be distributed between two friends ? Which numbers did you get ?
- How many number of biscuits are there which are divisible by 2 to divide them in two equal parts ?
- Write down five numbers divisible by a given number.

1 : ....., ..., ..., ..., ...

3 : ....., ..., ..., ..., ...

5 : ....., ..., ..., ..., ...

7 : ....., ..., ..., ..., ...

8 : ....., ..., ..., ..., ...

10 : ....., ..., ..., ..., ...

Multiple : If a number is divisible by a given number, the number is said to be a multiple of the given number.

Multiplying given number by 1, 2, 3,... we can get multiples of given number.

$3 \times 1 = 3$, $3 \times 2 = 6$, $3 \times 3 = 9$, $3 \times 100 = 300$

$3 \times 1000 = 3000$

Here 3, 6, 9,..., 300,... 3000 are multiples of 3.

- **The smallest multiple of any number is the number itself.**
- **There does not exist the largest multiple of a non-zero number.**
- **Number of multiples of a non-zero number are unlimited.**
- **Every number is a multiple of 1.**

Example 8 : State first five multiples of 6.

$6 \times 1 = 6$

$6 \times 2 = 12$

$6 \times 3 = 18$

$6 \times 4 = 24$

$6 \times 5 = 30$

Hence, the first five multiples of 6 are : 6, 12, 18, 24, 30

Practice 5

Write the first five multiples of the given number :

4 : ....., ..., ..., ..., ...

9 : ....., ..., ..., ..., ...

11 : ....., ..., ..., ..., ...

15 : ....., ..., ..., ..., ...

17 : ....., ..., ..., ..., ...

18 : ....., ..., ..., ..., ...

20 : ....., ..., ..., ..., ...

Exercise

1. Write the factors of :

(1) 24 (2) 27 (3) 39 (4) 46 (5) 72 (6) 36 (7) 64 (8) 100

2. Write the prime numbers between 50 to 100.

3. Factorise the following numbers into prime numbers using multiplication.

(1) 22 (2) 26 (3) 48 (4) 60 (5) 98 (6) 51 (7) 76 (8) 66

4. Factorise the given numbers into prime numbers using division :

(1) 14 (2) 28 (3) 54 (4) 81 (5) 72 (6) 92 (7) 85 (8) 90

5. Write the first four multiples of :

(1) 3 (2) 5 (3) 10 (4) 16 (5) 11 (6) 20 (7) 13 (8) 17

Practice 1

(1) 1, 23 (2) 1, 5, 25 (3) 1, 2, 3, 5, 6, 10, 15, 30 (4) 1, 5, 7, 35

(5) 1, 2, 3, 4, 6, 8, 12, 16, 24, 48 (6) 1, 7, 49 (7) 1, 5, 11, 55

(8) 1, 2, 3, 4, 5, 6, 10, 12, 15, 20, 30, 60 (9) 1, 5, 17, 85

(10) 1, 2, 4, 5, 10, 20, 25, 50, 100

Practice 2

1. (1) 53 (2) 97 (3) 73 (4) 41 (5) 67 (6) 89

2. 23, 29, 31, 37, 41, 43, 47

Practice 3

(1) $2 \times 2 \times 5$ (2) $2 \times 2 \times 7$ (3) $2 \times 2 \times 2 \times 2 \times 2$

(4) $2 \times 2 \times 3 \times 3$ (5) $2 \times 2 \times 2 \times 5$ (6) $2 \times 2 \times 2 \times 7$

(7) $2 \times 2 \times 2 \times 2 \times 5$ (8) $3 \times 3 \times 3 \times 3$

Practice 4

(1) $2 \times 2 \times 2 \times 3$ (2) $2 \times 3 \times 5$ (3) $2 \times 2 \times 3 \times 3$

(4) $3 \times 3 \times 5$ (5) $2 \times 5 \times 5$ (6) $2 \times 3 \times 3 \times 3$

(7) $2 \times 2 \times 2 \times 2 \times 2 \times 2$ (8) $2 \times 2 \times 2 \times 11$

Practice 5

(1) 4, 8, 12, 16, 20 (2) 9, 18, 27, 36, 45 (3) 11, 22, 33, 44, 55
(4) 15, 30, 45, 60, 75 (5) 17, 34, 51, 68, 85
(6) 18, 36, 54, 72, 90 (7) 20, 40, 60, 80, 100

Exercise

1. (1) 1, 2, 3, 4, 6, 8, 12, 24 (2) 1, 3, 9, 27 (3) 1, 3, 13, 39
(4) 1, 2, 23, 46 (5) 1, 2, 3, 4, 6, 8, 9, 12, 18, 24, 36, 72
(6) 1, 2, 3, 4, 6, 9, 12, 18, 36 (7) 1, 2, 4, 8, 16, 32, 64
(8) 1, 2, 4, 5, 10, 20, 25, 50, 100

2. 53, 59, 61, 67, 71, 73, 79, 83, 89, 97

3. (1) 2×11 (2) 2×13 (3) $2 \times 2 \times 2 \times 2 \times 3$ (4) $2 \times 2 \times 3 \times 5$
(5) $2 \times 7 \times 7$ (6) 3×17 (7) $2 \times 2 \times 19$ (8) $2 \times 3 \times 11$

4. (1) 2×7 (2) $2 \times 2 \times 7$ (3) $2 \times 3 \times 3 \times 3$ (4) $3 \times 3 \times 3 \times 3$
(5) $2 \times 2 \times 2 \times 3 \times 3$ (6) $2 \times 2 \times 23$ (7) 5×17 (8) $2 \times 3 \times 3 \times 5$

5. (1) 3, 6, 9, 12 (2) 5, 10, 15, 20 (3) 10, 20, 30, 40 (4) 16, 32, 48, 64
(5) 11, 22, 33, 44 (6) 20, 40, 60, 80 (7) 13, 26, 39, 52 (8) 17, 34, 51, 68

◆

Know something more :

- The number of factors of a number is definite. 1 has got only one factor. All other numbers have at least two factors.
- The number of multiples of a number is not definite. No number has the largest multiple.

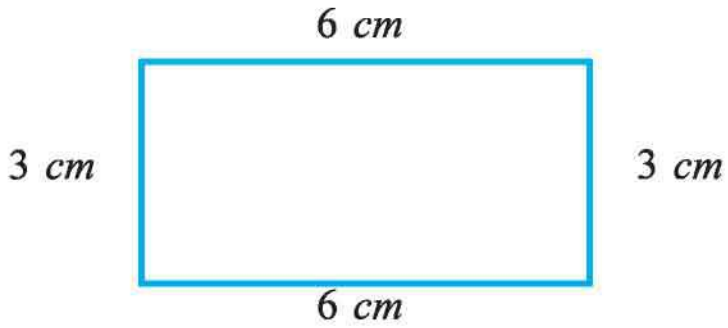
7 Perimeter and Area

❑ Perimeter :

◆ Activity 1 :

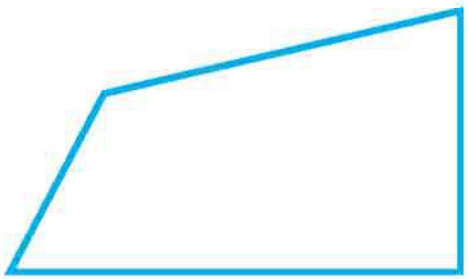
Measure the length of the sides of given figures and find the perimeter.

Example 1 :



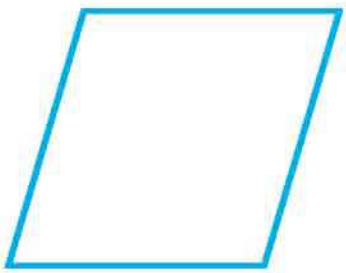
Perimeter = 6 + 3 + 6 + 3 = 18 *cm*

(1)



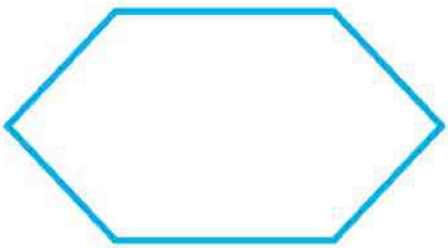
Perimeter =

(2)



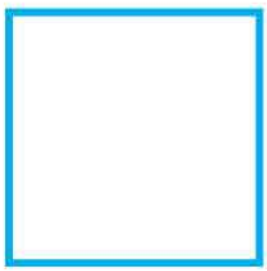
Perimeter =

(3)



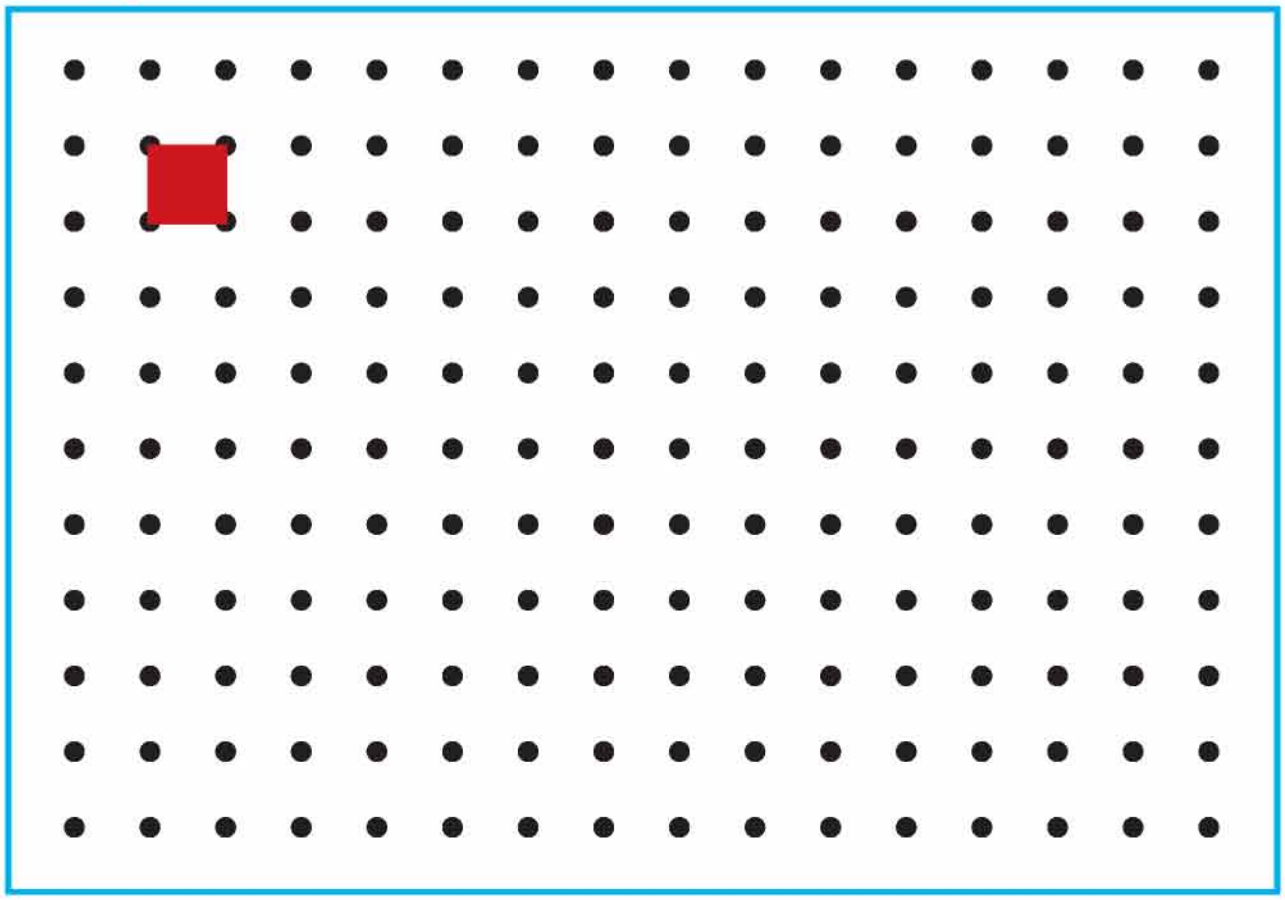
Perimeter =

(4)



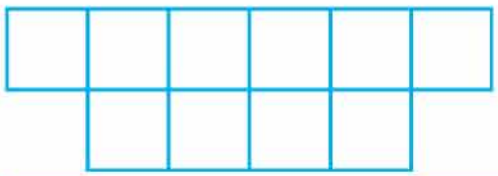
Perimeter =

Activity 2 :

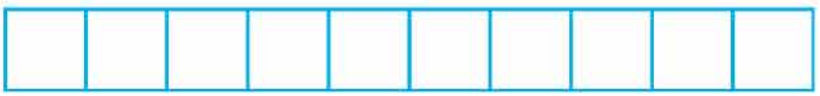


- Four dots are joined to form a coloured square in the above diagram. Its perimeter is 4 *cm*. The distance between any two consecutive dots is 1 *cm*.
- Form 10 such squares in the above diagram. An example is given below. Then, fill in different colour using wax crayons, sketch pen or pencil.

e.g. :



Perimeter = 16 *cm*



Perimeter = 22 *cm*

- **Write the perimeter of the figures formed by you :**

(1) Figure 1 : .....
(2) Figure 2 : .....
(3) Figure 3 : .....
(4) Figure 4 : .....
(5) Figure 5 : .....
(6) Figure 6 : .....

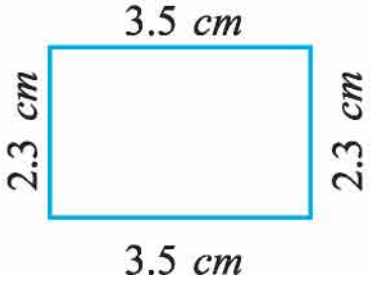
Think :

(1) Which figure has the largest perimeter of all figures drawn by you ?

(2) Which figure has the smallest perimeter of all figures drawn by you ?

Understand :

A bus-ticket has length of 3.5 *cm* and breadth of 2.3 *cm*. What is its perimeter ?



Perimeter of a rectangle = The sum of the lengths of the four sides

= 3.5 + 2.3 + 3.5 + 2.3

= 11.6 *cm*

Thus, the Perimeter of the bus-ticket is 11.6 *cm*.

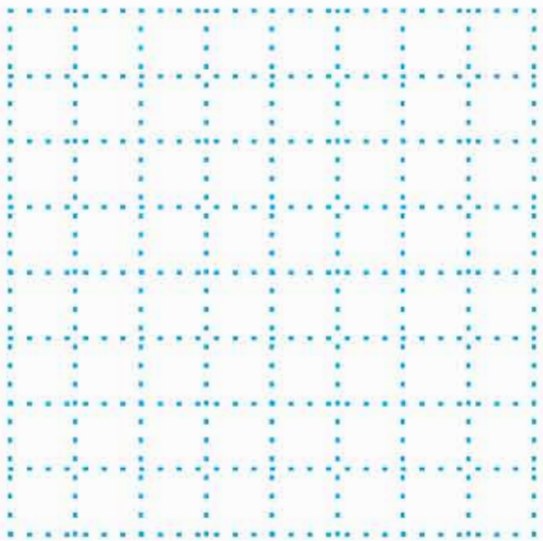
- **Activity 3 :**

Find the perimeter of the following books/note-books using a thread and a ruler :

(1) Mathematics : .....
(2) Science and Technology : .....
(3) Note-book : .....
(4) Essay Note-book : .....
(5) Fullscape book : .....
(6) Map-book : .....

- **Activity 4 :**

Draw three rectangles or squares on the graph-paper given below and find their perimeters.



Perimeter of figure 1 = ...

Perimeter of figure 2 = ...

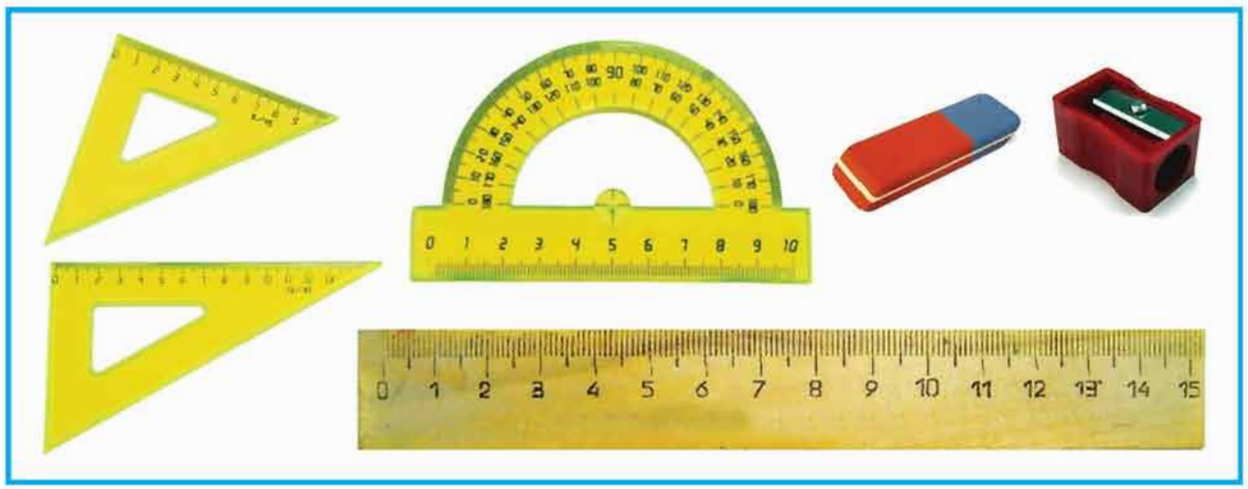
Perimeter of figure 3 = ...

Thus, it is clear from above figure that

Perimeter of a closed figure is the sum of the lengths of all sides of the figure.

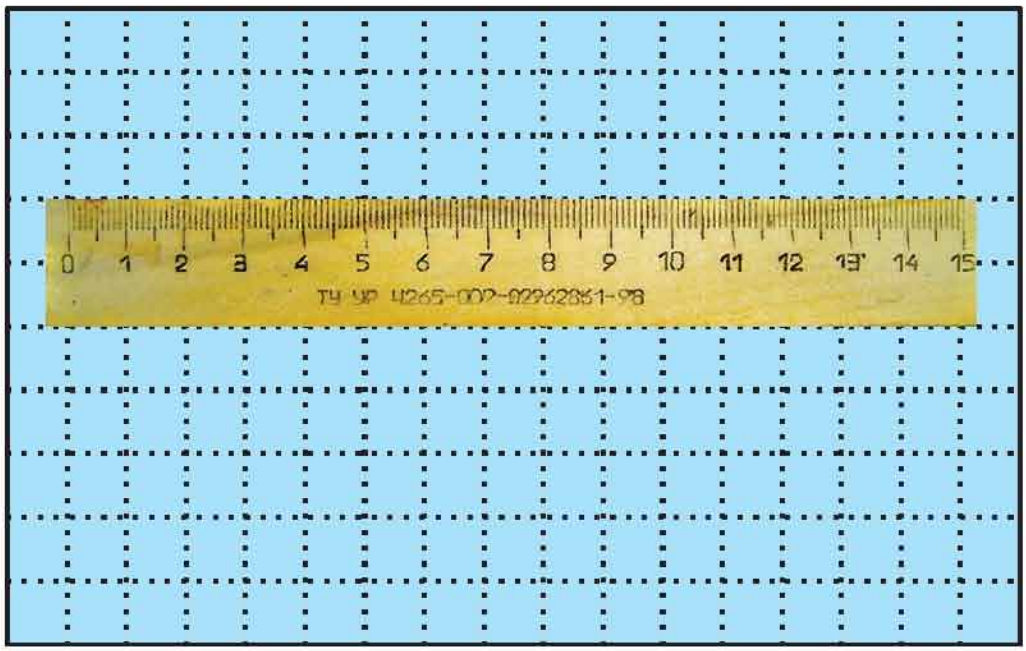
❑ Area :

- **Activity 5 :**



Draw lines with the edges of the objects arranged on the paper, you will find the imprint of different objects on the paper. Now, lift the objects one by one carefully. Then, fill in colour of your choice.

The way you did the eariler activity of arranging objects and taking imprints, let us observe how much space a ruler occupies putting it on the following graph paper.



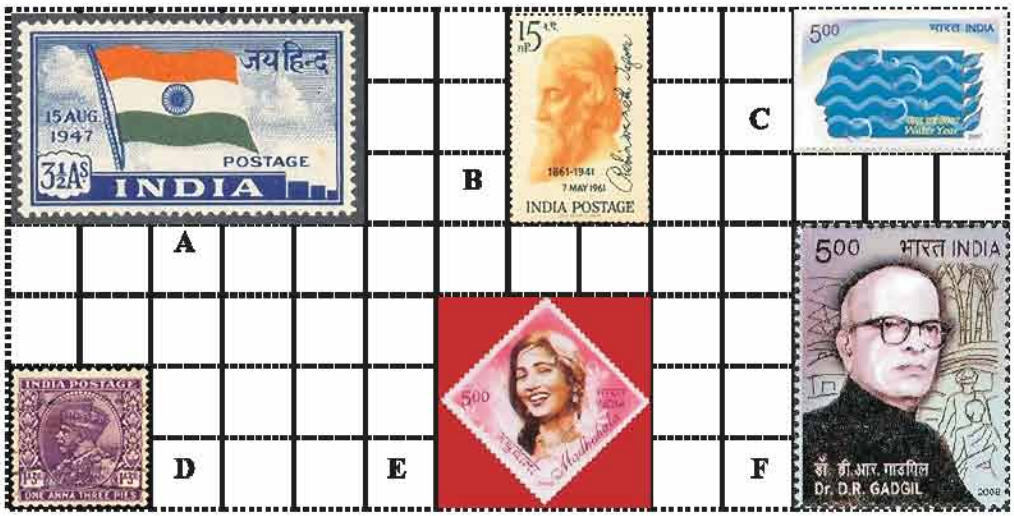
The ruler covers 30 square boxes, here.

So, the space occupied by the ruler = 30 square boxes

The number of square boxes occupied by the ruler shows the area of the ruler.

The measure of space occupied by any figure in a plane is called its area.

◆ **Activity 6 :** Observe and study the following different postal stamps placed on the graph paper and answer the questions. (The length and width of each square on the graph paper is 1 *cm*)



◆ **Now tell me :**

(1) Which postal stamp has the largest perimeter ? .....

(2) Which postal stamp has the smallest perimeter ? .....

(3) What is the perimeter of stamp E ? .....

(4) What is the perimeter of stamp F ? .....

(5) Which two postal stamps have equal perimeters ? .....

(6) Which postal stamp covers the maximum number of squares ?.....

(7) Which postal stamp covers the minimum number of squares? .....

(8) How many squares are occupied by stamp A ? .....

(9) How many squares are occupied by stamp D ? .....

- The space occupied by a postal stamp on a graph-paper is called its area.
- The number of squares occupied by any figure shows its area. The number of boxes is equal to square unit area of the figure.

◆ **Understand :**

- The space occupied by an object on a plane is called its area.
- Since area of each square on a graph paper is same. So, the area is counted as many squares occupied by it.
- Generally the squares on a graph paper are of 1 *cm* × 1 *cm*.
- If the length of a square is in *cm*, its area is written in square *cm*. If it is in feet, meters or kilometers, the area is written in square feet, square meters or square kilometers rspectively.

◆ **Find and write :**

(1) What is the area of stamp C in square *cm* ? .....

(2) What is the area of stamp F in square *cm* ? .....

(3) What is the area of stamp A in square *cm* ? .....

(4) What is the area of stamp B in square *cm* ? .....

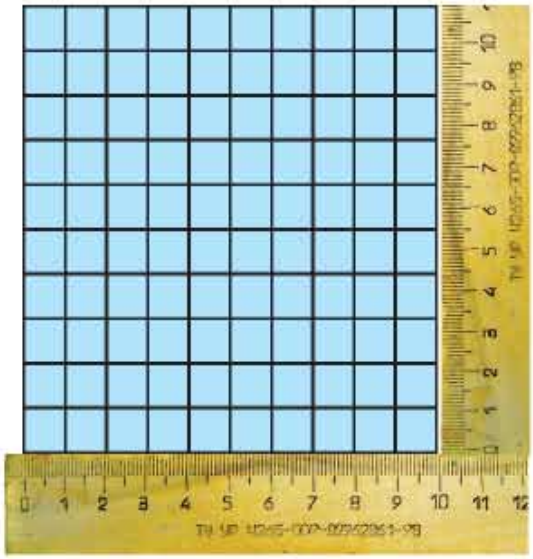
◆ **Do this as well :**

(1) Collect different stamps, paste them in your note book and find their perimeter and area.

(2) Draw squares of 1 *cm* × 1 *cm* on a post-card and find the area of the post-card.

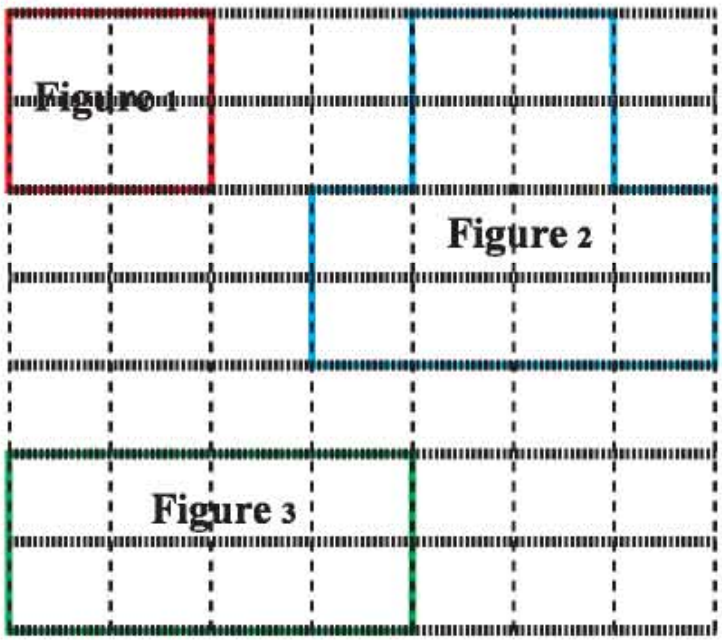
◆ **Activity 7 : Let us learn how to make a graph paper :**

- Place a ruler in your note-book as shown.
- Mark a dot at a distance of 1 *cm* on it.
- Place a ruler on all the four edges in this way and mark dots at distance of 1 *cm* each.
- Join marked dots on opposite sides as shown.
- Thus the graph paper will be prepared.



◆ **Activity 8 :**

Fill in colours of your choice in the figures drawn on the graph paper and answer the questions :



Find :

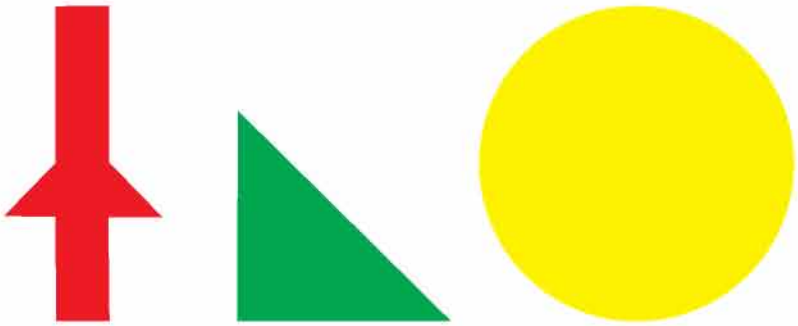
(1) Area of figure 2 is ..... *sq cm* and perimeter is ..... *cm*.

(2) Perimeter of figure 1 is ..... *cm* and area is ..... *sq cm*.

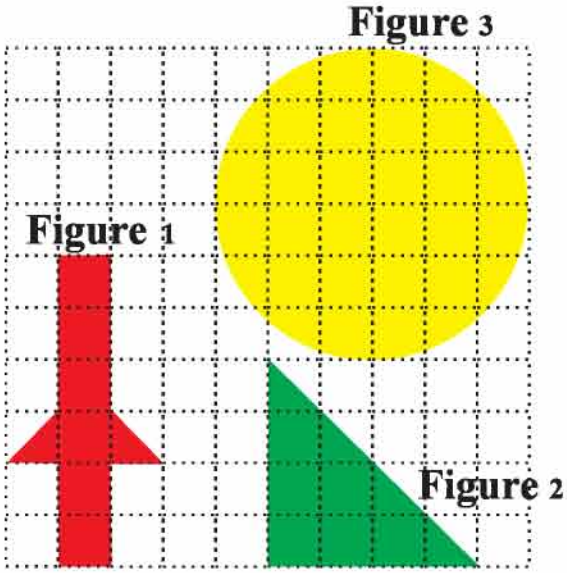
(3) Perimeter of figure 3 is ..... *cm* and area is ..... *sq cm*

(4) Which figure has the largest area ? .....

◆ **See and understand :**



- How much space is occupied by the figures on the plane as shown above ? Which figure occupies the maximum area ?
- Which figure amongst the figures given above do occupy the maximum area ?
- It is difficult to find the area of the figures as shown above at a glance just having a look at them. Let us now place these figures on a graph paper.



Looking at the graph paper.

- The figures have occupied some of the full and some of the incomplete squares. Depending upon it we can easily find out the area.
- Each square measures 1 *cm* × 1 *cm*. So, each square has an area of 1 *sq cm*.
- We do not consider a square occupying less than half of the area.
- If a figure occupies more than half of the squares, we consider it as a full square.
- If any figure occupies exactly the half of the squares, its area is considered as the half of the *sq cm*.

Area of figure 1 :

Squares occupied by the figure	Number of Squares	Area in *sq cm*
Complete squares	6	6
Half squares	2	$2 \times \frac{1}{2}$
More than half of the squares	0	0

Complete area = Area of squares + Area of half squares + Area of squares more than half

$= 6 + 2 \times \frac{1}{2} + 0$

$= 6 + 1 = 7$ *sq cm*

Area of figure 2 :

Squares occupied by the figure	Number of Squares	Area in *sq cm*
Complete squares	6	6
Half of the squares	4	$4 \div 2 = 2$
More than half of the squares	0	0

Total Area = Area of complete squares + Area of half squares

= 6 + (4 ÷ 2)

= 6 + 2 = 8 *sq cm*

Area of figure 3 :

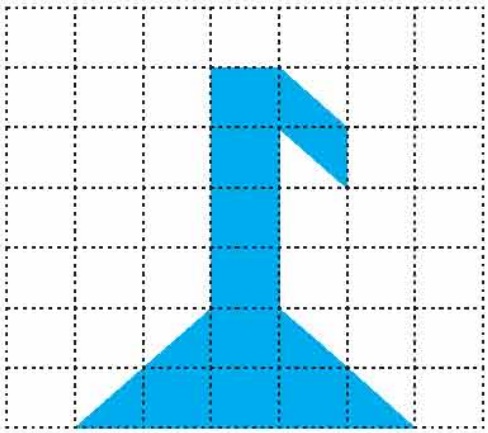
Number of squares occupied by the figure	Number of squares	Area in *sq cm*
Complete squares	24	24
Half squares	8	8 ÷ 2 = 4
More than half of the squares	0	0

Total area = Area of squares + Area of half squares

= 24 + 4

= 28 = 28 *sq cm*

Example 2 : Find the area of the figure drawn on the graph paper.



Squares occupied	Number of Squares	Area in *sq cm*
Complete squares	8	8
Half squares	6	6 ÷ 2 = 3
More than half of the squares	0	0

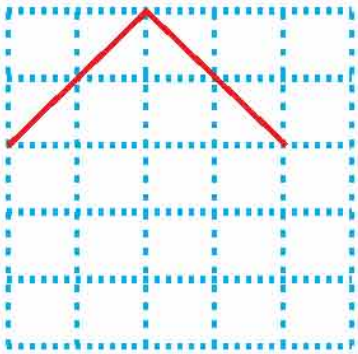
Total Area = Area of Complete squares + Area of half squares

= 8 + (6 ÷ 2)

= 8 + 3 = 11 *sq cm*

◆ **Activity 9 :**

- Complete the following figure in such a way that its area comes to 8 *sq cm*. Fill in colour of your choice in the figure you draw.



Estimate :

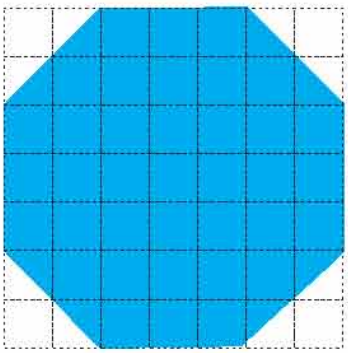
(1) Which area is more; your foot-step or a page of this book ?

(2) Which area is less; two currency notes of ₹ 10 or one currency note of ₹ 500 ?

Practice 1

1. Find the Area :

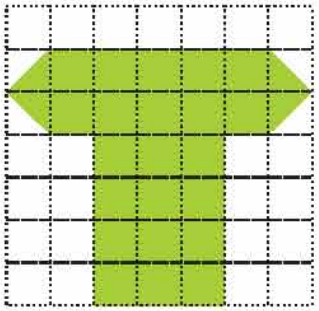
(1)



No. of squares occupied by the figure	Number of squares	Area in *sq cm*
Complete squares		
Half of the squares		
More than half of the squares		

Calculation :

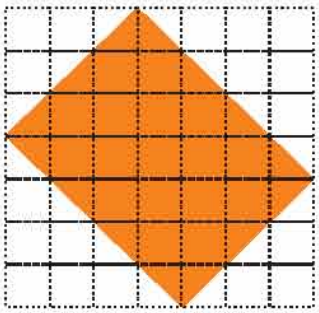
(2)



No. of squares occupied by the figure	Number of squares	Area in *sq cm*
Complete squares		
Half of the squares		
More than half of the squares		

Calculation :

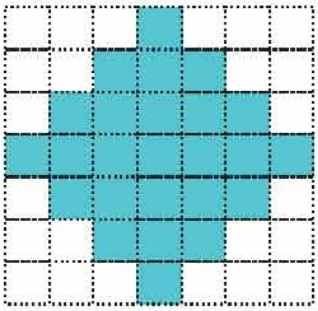
(3)



No. of squares occupied by the figure	Number of squares	Area in *sq cm*
Complete squares		
Half of the squares		
More than half of the squares		

Calculation :

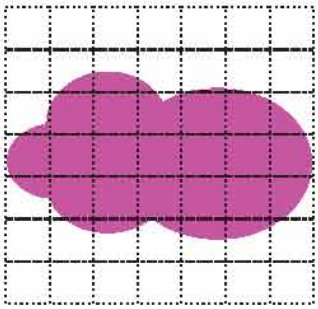
(4)



No. of squares occupied by the figure	Number of squares	Area in *sq cm*
Complete squares		
Half of the squares		
More than half of the squares		

Calculation :

(5)

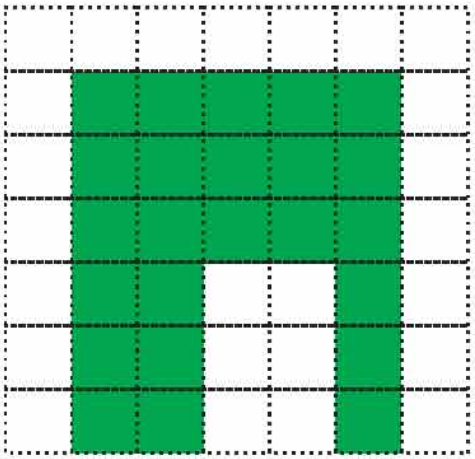


No. of squares occupied by the figure	Number of squares	Area in *sq cm*
Complete squares		
Half of the squares		
More than half of the squares		

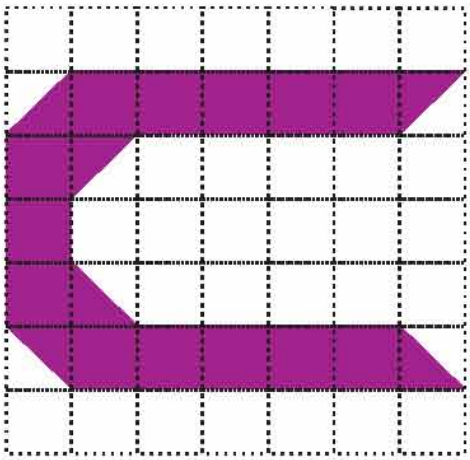
Calculation :

2. Do it yourself in your notebook. Find the area occupied by the following figures.

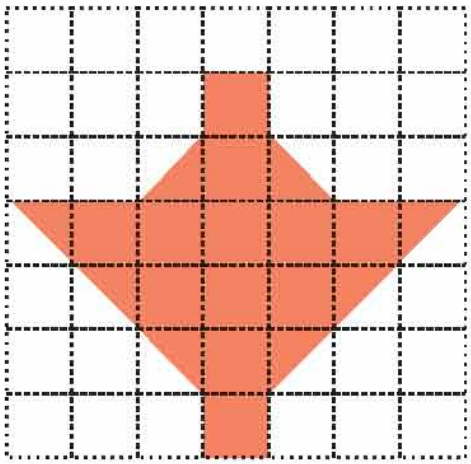
(1)



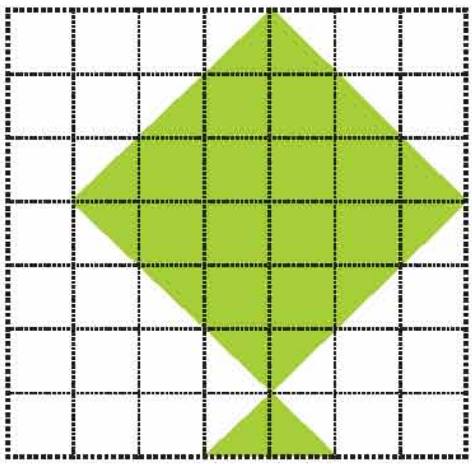
(2)



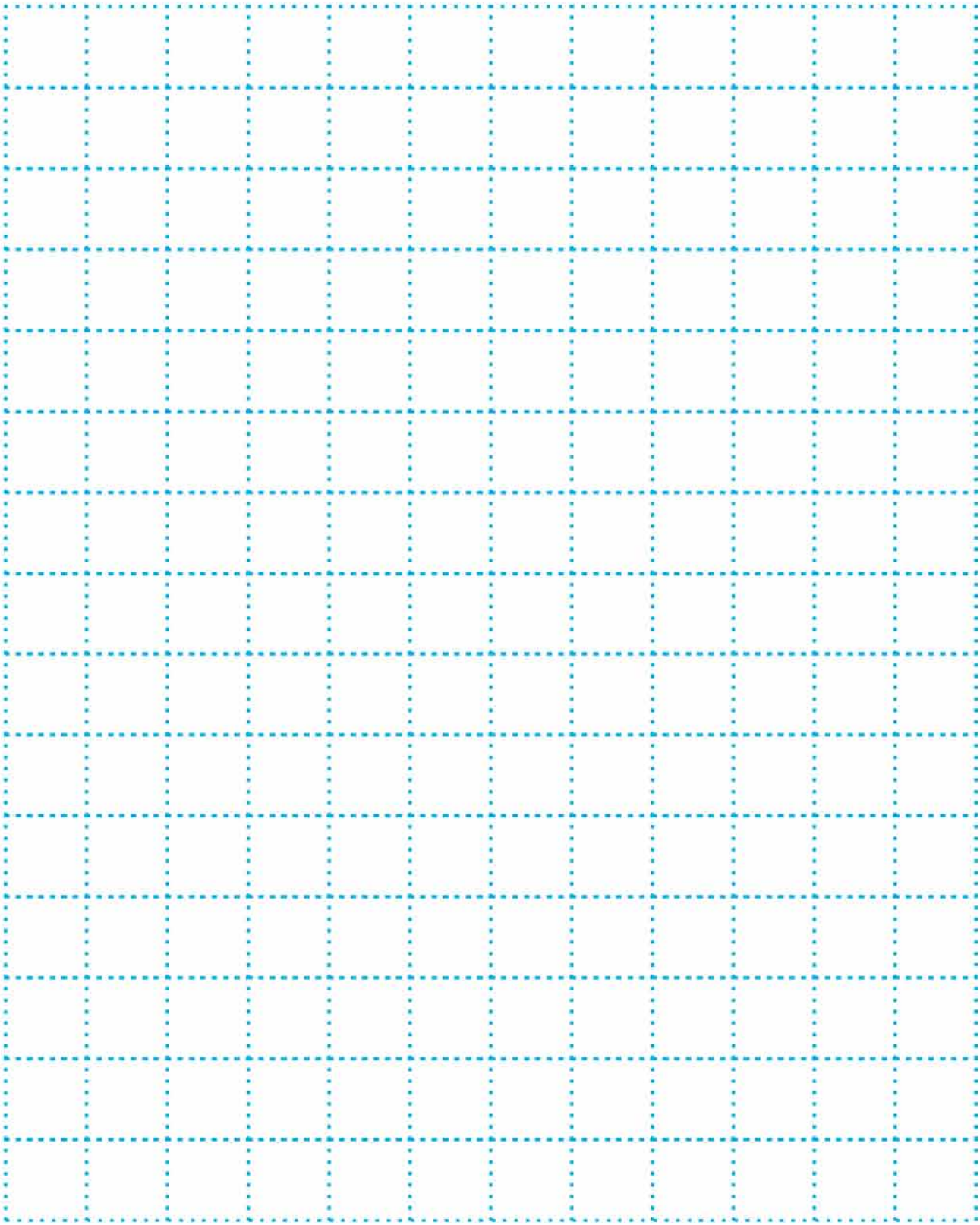
(3)



(4)



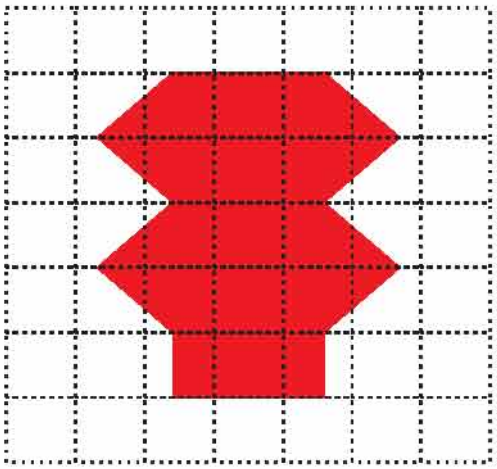
3. Place your compass box and the instruments on a graph paper. Find approximate area of them.



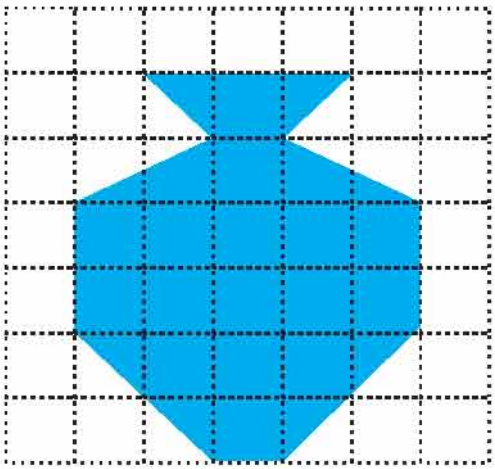
Exercise

1. Find the area :

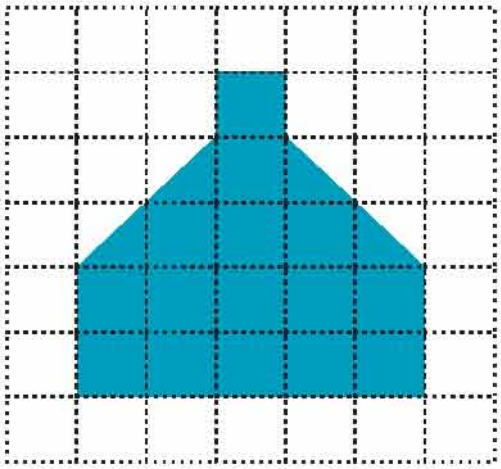
(1)



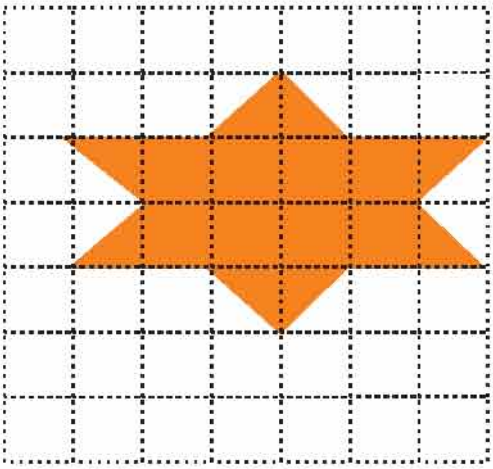
(2)



(3)



(4)



2. Prepare a graph-paper of 1cm × 1cm boxes and find area of the following:

(1) A ₹ 10 currency note and a ₹ 20 currency note

(2) Top surface of a lid of a jar

(3) A match box

Answers

Practice 1

1. (1) 41 sq units (2) 24 sq units (3) 24 sq units
(4) 25 sq units (5) 18 sq units

2. (1) 24 sq units (2) 16 sq units (3) 16 sq units (4) 19 sq units

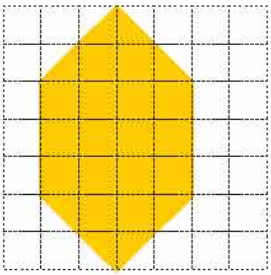
Exercise

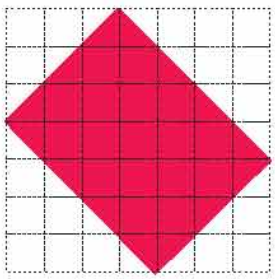
1. (1) 14 sq units (2) 21 sq units (3) 17 sq units (4) 12 sq units

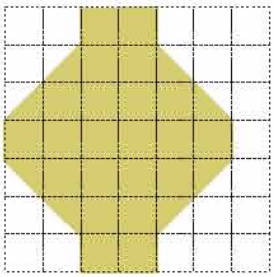
- Observe computer presentation about perimeter and area prepared by your teacher. Answer the questions she/he askes.

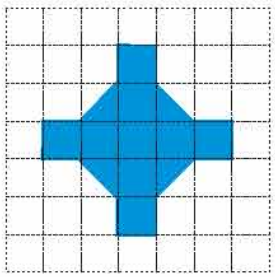
◆

Do it yourself :

(1) 

(2) 

(3) 

(4) 

Revision : 2

1. Fill in the blanks :

(1) ..... is the smallest whole number.

(2) ..... are whole numbers.

(3) ..... is the smallest natural number.

(4) Whole numbers begin with .....

(5) 7 + ... = 7

(6) 13 × 12 = 12 × .....

(7) (18 + 9) + 10 = 18 + (9 + ...)

(8) 25 × 0 = ...

(9) ..... + 17 = 17

(10) 21 × (5 + 3) = (21 × .....) + (21 × .....)

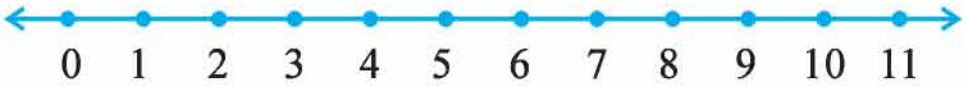
(11) 16 × (2 + 4) = (..... × 2) + (16 × .....)

(12) (2 + 3) + 22 = (2 + ...) + 3

(13) 0 × ..... = 0

(14) 27 × (19 + 1) = (..... × 19) + (27 × .....)

2. Answer the following questions based on the given number line.



(1) How many whole numbers less than 6 are there ? Which are they ?

(2) How many whole numbers greater than 6 are there ? Which are they ?

(3) On which side of 4 is 7 ?

(4) On which side of 8 is 5 ?

(5) How many whole numbers are there between 3 and 9 ? Which are they ?

3. Form ten different numbers using 2, 3, 4, 5, 7, 8, 9. Write them in figures and words :

4. **Write place-value of the underlined digits :**

(1) 4774864

(2) 6748201

(3) 800957

(4) 1209660

(5) 6984678

(6) 5532503

5. **Are the following numbers divisible by 2, 3, 5 or 10 ? Mark them with ✓ or × accordingly.**

Number	by 2	by 3	by 5	by 10	By all four
14872					
54085					
37864					
43187					
80910					
22443					
86750					
1819110					

6. **State the factors of :**

(1) 16 (2) 36 (3) 50 (4) 63

7. Write the missing multiples :

(1) 7, 14, ..., ..., ..., ...

(2) ....., 18, 27, ..., ..., ...

(3) ....., ..., ..., 40, 50, ...

(4) ....., ..., 39, ..., ..., 78

8. Write down prime numbers between 35 and 55.

9. Write down composite numbers between 75 and 100.

10. Make different 10 chits of numbers from 0 to 9, put them between your friend and you. Now, pick up any six chits randomly, form any two numbers of six digits. Ask your friend to do addition of two numbers. Check whose sum total is larger. You may play this game thrice.

11. Subtraction : Play the same game and do subtraction.

12. Calculate :

(1)	(2)	(3)	(4)
643247	478398	632432	843630
+ 138903	+ 388007	− 321321	− 703218

13. ₹ 1,53,325 were deposited on Monday and ₹ 1,73,500 were deposited on Tuesday in a co-operative bank. How much money was deposited in all ?

14. Ramjibhai sold cottonseeds worth ₹ 3,72,500 and oil seeds worth ₹ 4,82,300. And if the production cost is ₹ 3,50,000, what is the net income of Ramjibhai ?

15. Multiply :

(1)	(2)	(3)	(4)	(5)
132	453	739	432	678
× 12	× 13	× 68	× 120	× 103

16. Divide :

(1) 4238 ÷ 10 (2) 6738 ÷ 12 (3) 7832 ÷ 15

(4) 8895 ÷ 25 (5) 6238 ÷ 50

17. Rashmiben purchased 115 kg tomatoes at the rate of ₹ 45 per kg. How much did she pay ?

18. Annual rent of Yusufbhai's shop is ₹ 18,000. Find its monthly rent.

19. Find out the perimeter of your drawing-book.

20. Find perimeter and area of a 15 *cm* long ruler.

21. Find area of your palm using a graph-paper.

1. (1) 0 (2) endless in number (3) 1 (4) 0 (5) 0 (6) 13 (7) 10 (8) 0
(9) 0 (10) 5, 3 (11) 16, 4 (12) 22 (14) 27, 1

2. (1) Six 0, 1, 2, 3, 4, 5 (2) Five 7, 8, 9, 10, 11
(3) Right hand side (4) Left hand side (5) Five; 4, 5, 6, 7, 8

4. (1) 40,00,000; 4 (2) 7,00,000; 8000 (3) 0, 50
(4) 9000, 60 (5) 60,00,000; 70 (6) 30,000; 0

6. (1) 1, 2, 4, 8, 16 (2) 1, 2, 3, 4, 6, 9, 12, 18, 36
(3) 1, 2, 5, 10, 25, 50 (4) 1, 3, 7, 9, 21, 63

8. 37, 41, 43, 47, 53

9. 76, 77, 78, 80, 81, 82, 84, 85, 86, 87, 88, 90, 91, 92, 93, 94, 95, 96, 98, 99

12. (1) 7,82,150 (2) 8,66,405 (3) 3,11,111 (4) 1,40,412

13. ₹ 3,26,825 **14.** ₹ 5,04,800

15. (1) 1584 (2) 5889 (3) 50,252 (4) 51,840 (5) 69,834

16. (1) quotient : 423; remainder : 8 (2) quotient : 561; remainder : 6
(3) quotient : 522; remainder : 2 (4) quotient : 355; remainder : 20
(5) quotient : 124; remainder : 38

17. ₹ 5175 **18.** ₹ 1500

Mathematics

Std 5

(Semester-II)

8 Calculator

☞ Let us Learn Something New :

Friends, have you come across a Calculator ? Have you ever used it ? Let us get some information about calculator. A calculator works on the energy from different types of cells or solar energy.

Simple Calculator

Scientific Calculator

A calculator is also available in computers and mobile phones also.

◆ Uses of Calculator :

It has different keys for the mathematical operations like addition, subtraction, multiplication, division and square root. With the help of it we can perform mathematical operations quickly. Moreover, by using a scientific calculator, we can perform specific mathematical calculations precisely and quickly. Calculator has made the task of calculations of larger and more digit numbers quiet convenient. As shown in the pictures above, a calculator has a rectangular display screen where the numbers are displayed as we press different keys.

◆ Introduction of different keys and its usage :

Key/Keys	Usage
ON	To switch on the calculator (when we switch it on, we see '0' (zero) on the display screen.)
OFF	To switch off the calculator.
0 1 2 3 4 5 6 7 8 9	Numeric keys for calculations.
.	To enter decimal point.
+ − × ÷	For elementary mathematical operations
=	To get the final result of any calculation.
C or CE	'Clear' or 'Cancel Entry' : To cancel or to clear a particular entry before the final operation without doing all the calculations again.
AC	'All Clear' or 'All Cancel' : To clear the existing digits or to clear all calculations from the screen.

The above mentioned keys are commonly found in all kinds of calculators. In addition to these, we can have some keys like : Check, √, MR, MC, % etc., in some type of the calculators.

- Key C or CE is used only to remove the last entered number and the other calculations remain as they are where as by using key AC, the entire calculation is removed and calculator gets ready for a new task. We get an answer upto eight digits in a simple calculator.

Practical uses of calculator :

Where have you seen a calculator being used ? Note.

.....

.....

Now let's learn how a sum is solved with the help of a calculator.

Example 1 : Obtain 239 + 460 with the help of a calculator.

Now let us see how to perform calculations by using a calculator :

On pressing the key	Screen shows
ON	0
2	2
3	23
9	239
+	239 +
4	4
6	46
0	460
=	699 =

So, 239 + 460 = 699

Exercise

1. Calculate the following with the help of a calculator :

(1) 537 + 21 (2) 900 – 325 (3) 1522 + 5789

(4) 950 ÷ 5 (5) 570 × 25

2. Fill in the blanks :

(1) ..... key is used to remove all the calculations from a calculator.

(2) ..... key is used to know the final result of the product of 12 and 15.

(3) When a calculator is switched on, ... is displayed on the screen.

(4) [OFF] key is used to ..... a calculator.

◆ **Tricks with a Calculator :**

Perform the following multiplications on a calculator and observe.

3367	×	your age	×	3	
1443	×	your roll number	×	7	
777	×	your birth date	×	13	(only date)
299	×	your birth year	×	39	(Use only unit and tenth digit, if e.g. 2002, then 02)
111	×	your friend's age	×	91	

Exercise

2. **(1)** AC **(2)** = (equal) **(3)** zero **(4)** switched off

✦

◆ Using reference books, try to know more about different types of calculators.

9 Average

☞ **Let us Learn Something New :**

Activity 1 :

All the students would go out and collect as many pebbles as they can, in two minutes. As per instructions by the teacher, form groups of five students in each. Count all the pebbles collected by all the students. Now, think what could be done to distribute equal number of pebbles among all.

Hari has got 9, Dharati has got 5, Anil has got 7, Firoz has got 8 and Stela has got 6 pebbles. All the pebbles collected by these five students of the group were placed in centre.

- **First method of distribution :**

Each member picked up one pebble in turn repeatedly. This process went on till the last pebble got picked up. When counted each one has seven pebbles.

- **Second method of distribution :**

All five students put their pebbles in centre.

Thus, it could be said that the number of pebbles got by each member is the average of the total pebbles.

For Example,

Mit, Jeet and Preet are three brothers. Every day they deliver milk door to door and earn ₹ 66, ₹ 54 and ₹ 75 respectively. If this amount is collected together and then distributed equally, each one gets ₹ 65. Here, ₹ 65 is called an average of ₹ 66, ₹ 54 and ₹ 75, which can be understood by the following formula :

$$\text{Average} = \frac{\text{Sum of the amounts}}{\text{Total number of amounts}}$$

$$= \frac{66+54+75}{3}$$

$$= \frac{195}{3}$$

$$= 65 \qquad \therefore \text{ Average} = ₹\ 65$$

Formula to Calculate average :

$$\text{Average} = \frac{\text{Sum of all given numbers}}{\text{Total number of numbers}}$$

- When the sum of all given numbers is divided by the total number of numbers, the number obtained is known as the **'average.'**
- Average is also known as **'mean'**.

Example 1 : Find the average of 23, 20, 19 and 18.

Solution :

$$\text{Average} = \frac{\text{Sum of given numbers}}{\text{Total number of numbers}}$$

$$= \frac{23+20+19+18}{4}$$

$$= \frac{80}{4}$$

$$= 20 \qquad \therefore \text{ Average} = 20$$

Example 2 : Find the average of 150, 168, 124, 105, 143 and 114.

Solution : Average $= \dfrac{\text{Sum of given numbers}}{\text{Total number of numbers}}$

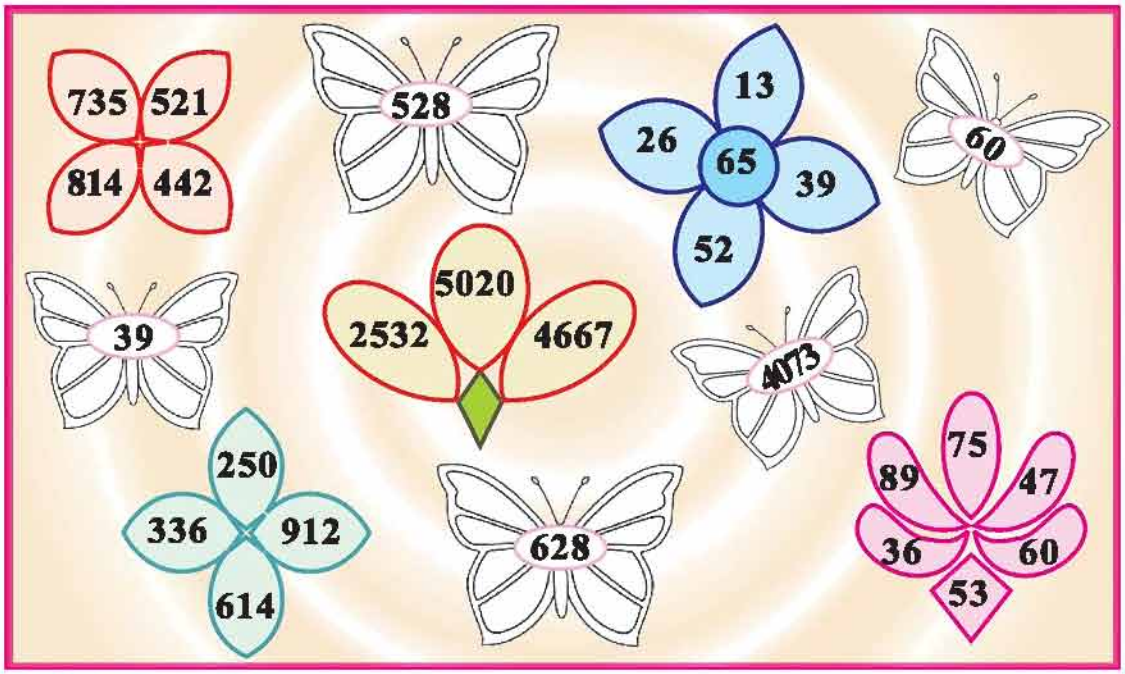
$$= \frac{150+168+124+105+143+114}{6}$$

$$= \frac{804}{6} = 134 \qquad \therefore \text{ Average} = 134$$

When the sum of given numbers is distributed equally, the number so obtained is called the 'average'. Average is also known as 'mean'.

Practice 1

The average of the numbers written in each flower is shown in a butterfly. Make the corresponding pairs and fill in the similar colour accordingly :



Practical Puzzles :

Average is used in our routine life. For example, the average number of runs scored by a cricketer in cricket match; the average of rainfall in monsoon, the average of profit or loss to a businessman, the average of temperature experienced during summer etc. Let us see some of the practical examples of such Average.

Example 3 : There are 320 students in *Kahona* primary school. The figures given in the following table indicate the number of students taking mid-day meal during a week. Find the average of the number of students taking mid-day meal.

Days	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Number of students taking mid-day meal	300	285	304	297	279	257

Solution :

$$\text{Average} = \frac{\text{Sum of all students taking mid-day meal}}{\text{Total number of days}}$$

$$= \frac{300+285+304+297+279+257}{6}$$

$$= \frac{1722}{6} = 287$$

∴ The average number of students taking mid-day meal is 287.

Example 4 : With a view to help the people affected by Tsunami in South India, a relief fund was collected by a school. 9 classes of secondary section contributed ₹ 4320 and 8 classes of primary section contributed ₹ 4163 to the fund. Calculate the average of the contribution by each class.

Solution :

$$\text{Average} = \frac{\text{Total amount of contribution}}{\text{Total number of classes}}$$

$$= \frac{4320+4163}{9+8}$$

$$= \frac{8483}{17}$$

$$= 499$$

∴ Average contribution of each class is ₹ 499.

Practice 2

(1) The weights of five students of a class are 50 *kg*, 44 *kg*, 36 *kg*, 48 *kg* and 32 *kg* respectively. Find their average weight.

(2) The expense in rupees of Aditya's engineering course for six months is as follows :

₹ 7200, ₹ 6428, ₹ 5250, ₹ 5426, ₹ 6776, ₹ 4326.

Calculate average of his monthly expenditure.

(3) Heenaben deposits milk in a village-dairy everyday as per the details given below. Find average of milk in litre deposited during a week in the dairy.

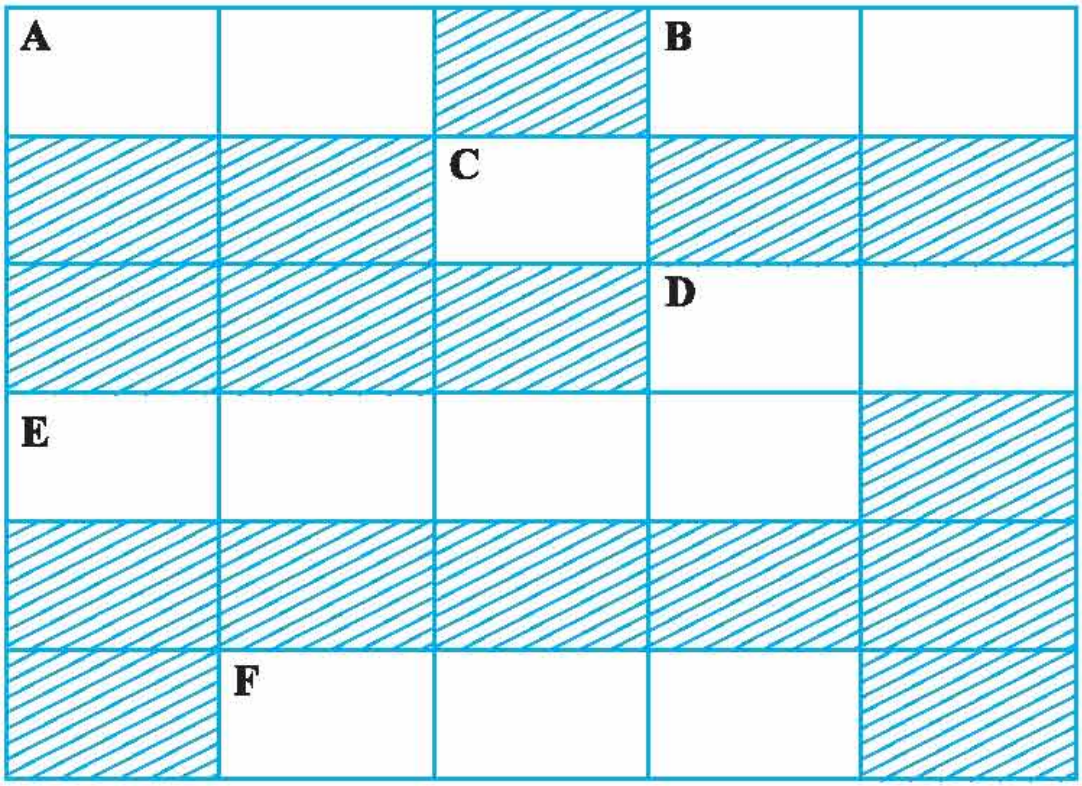
Days	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Milk deposited (in litre)	11.500	8.700	10.400	9.800	7.600	9.400	12.600

(4) A merchant sold 1200 *kg* mangoes in the month April, 1380 *kg* in the month May, 1320 *kg* in the month June. Find average sale of mangoes.

(5) The total income of Shakil's father during 6 months is ₹ 67,590. The total income of Shakina's father during 3 months is ₹ 45,780. Whose monthly average of income is more ? How much ?

Exercise

1. Answer the following questions and write answers in the box accordingly :



(A) The average of first five concecutive two digit numbers.

(B) The average of the smallest one digit, two digit and three digit natural numbers.

(C) The average of factors of 15.

(D) The average of 15, 18, 21, 24, 27.

(E) The average of first five concecutive four digit numbers.

(F) Average of 100, 150, 200, 250.

2. Calculate :

(1) The daily temperatures (in celcius) during 5th May to 10th May in Vadodara city were as follows :

Find the average of daily temperature during these days.

42.5°, 40.7°, 41.1°, 40.3°, 39.9°, 41.5°.

(2) 410 *kg* wheat, 390 *kg* rice and 190 *kg tuver dal* are utilised during a week in a hostel. Find the average of grains utilised during a week.

(3) The daily sales of a shop from Monday to Saturday are ₹ 530, ₹ 655, ₹ 598, ₹ 498, ₹ 527 and ₹ 516 respectively. What is the average sale for these six days ?

(4) Kanu scored 60, 34, 43, 51 and 42 runs in five innings respectively, whereas Manu scored 46, 61, 53, 68, 49, 50 and 44 runs in seven innings respectively. Calculate the average of runs scored by each of them and decide which player is better ? (Both of them have not remained unbeaten (not out) in any innings).

(5) (A) Find the average weight of 10 students in your class.

(B) Find daily average of attendance of the students in your class from the daily attendance register.

Practice 2

1. (1) 42 *kg* (2) ₹ 5901 (3) 10 litres (4) 1300 *kg*

(5) The monthly average income of Shakina's father is more by ₹ 3995.

Exercise

1. (A) 12 (B) 37 (C) 6 (D) 21 (E) 1002 (F) 175

2. (1) 41° celcius (2) 330 *kg* (3) ₹ 554 (4) Manu is better.

10 Circle

We see many objects around us, which are round in shape.

e.g., a ball, a lemon, an orange.

Make a list of round shaped objects found around you :

Can these objects be said to have the shape of a circle ?

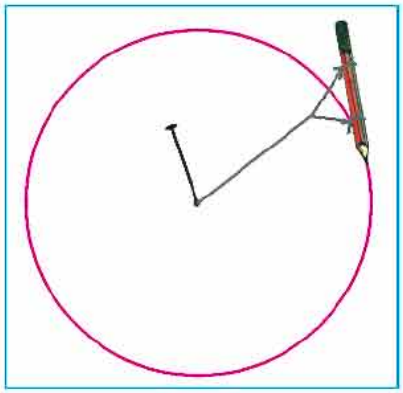
Few pictures are given below, which one has the shape of a circle ?

Activity 1 :

Collect circular objects available around you. Place them on a paper, draw circular figure with the help of their edges with a pencil.

The edge of a circular object is a circle.

Activity 2 :



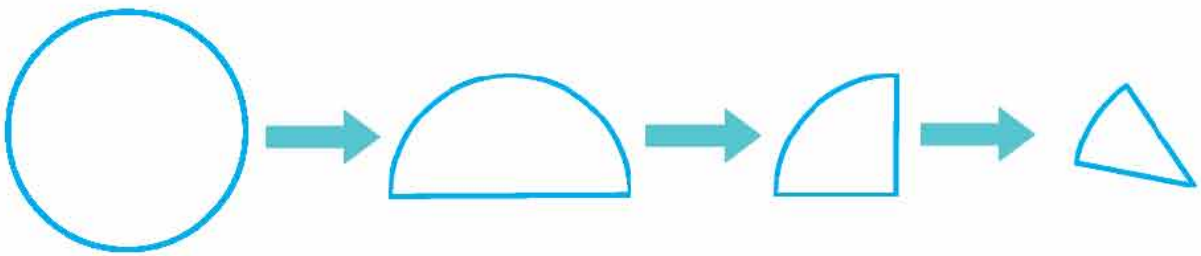
Take a string and tie a pencil at one end, a pin at the other end of the string. Fix pin at some point on the paper, now rotate the pencil keeping the string straight (tight). We see that the figure drawn is a circle.

The point at which the pin is fixed is known as the **centre of the circle.**

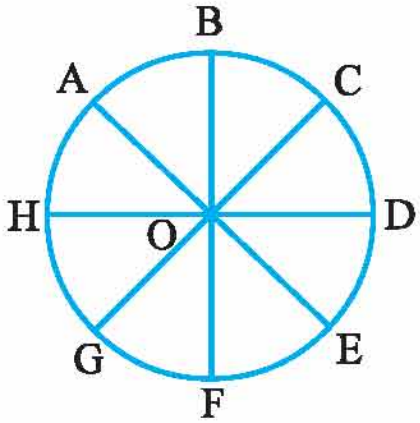
- **Radius :**

Activity 3 :

- Draw a circle on a paper and cut it carefully.
- Fold the paper as shown in the following figure and then unfold it.



- We see the folds as shown in the following figure.
- Draw the lines on the folds using a pencil and a ruler.
- Label, the figure as shown below.



- In the given figure $\overline{OA}$, $\overline{OB}$, $\overline{OC}$, $\overline{OD}$, $\overline{OE}$, $\overline{OF}$, $\overline{OG}$, $\overline{OH}$ are the radii of the circle.

You can observe that, one end point of a radius is the centre of the circle and the other end is a point on the circle.

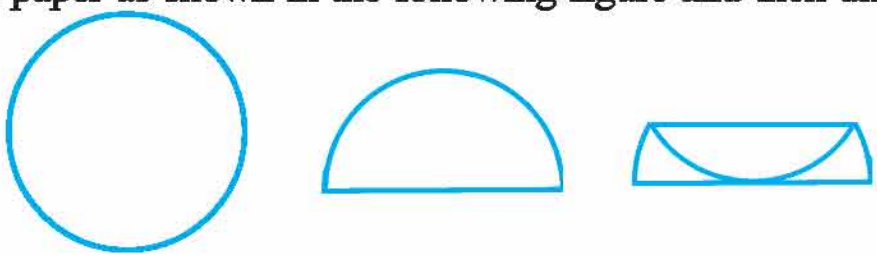
- A line segment whose one end point is the centre of the circle and the other end point is on the circle is called a radius of the circle.

- Using a scale, measure each radius of the circle. What have you observed during each measurement ?

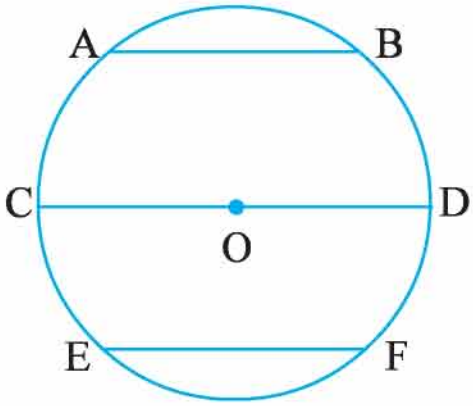
- **Chord and Diameter :**

Activity 4 :

- Draw a circle on the paper and cut it carefully.
- Fold the paper as shown in the following figure and then unfold it.



- The folds will be observed as shown in the following figure. Lable the figure.

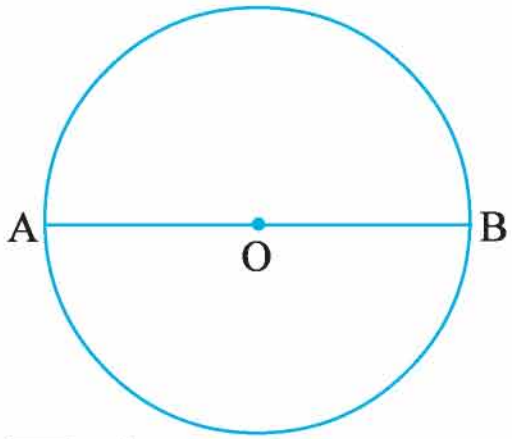


- Each line segment joins any two points of the circle as shown in the figure.
- **A line segment joining any two points of the circle is known as a chord of the circle.**

OR

- **If both end points of a line segment are on the circle, it is called a chord of the circle.**

- $\overline{AB}$, $\overline{CD}$, $\overline{EF}$ are the chords of the circle. Measure them.
- Which chord has the largest measure ?
- Which chord does passes through the centre of the circle ?
- $\overline{CD}$ is the largest chord of the circle, and it is known as a diameter of the circle.
- **A chord passing through the centre of the circle is known as a diameter of the circle. It is the largest chord.**
- **Relation between a Radius and a Diameter :**



- Measure $\overline{OA}$ and $\overline{OB}$ using a scale.
  OA = ... *cm* and OB = ... *cm*
- Now, measure $\overline{AB}$. AB = ... *cm*
  Therefore AB = ... + ...
  What is the relation between $\overline{OA}$ and $\overline{AB}$? _____
  What is the relation between $\overline{OB}$ and $\overline{AB}$? _____

- The diameter is twice the radius.

So, Diameter = Radius + Radius OR 2 × Radius

Example 1 :	**Example 2 :**	**Example 3 :**
Radius = 5 *m*	Radius = 10.5 *cm*	Radius = 11.5 *cm*
Diameter = 2 × radius	Diameter = 2 ×	Diameter = ... × radius
= 2 × 5	= 2 ×	= 2 × .....
= 10 *m*	= ..... *cm*	= ..... *cm*

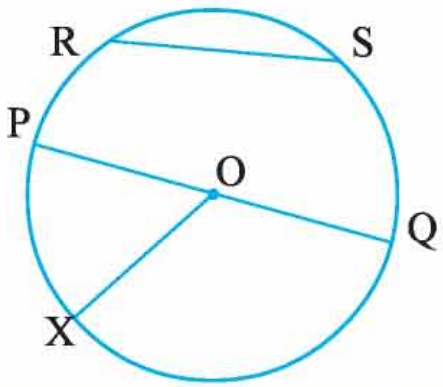
- **Radius is the half of the diameter.**

So, Radius = Diameter ÷ 2

Example 4 :	**Example 5 :**	**Example 6 :**
Diameter = 22 *cm*	Diameter = 15 *cm*	Diameter = 12 *cm*
Radius = Diameter ÷ 2	Radius = Diameter ÷ 2	Radius = Diameter ÷ 2
= 22 ÷ 2	= 15 ÷	= ..... ÷ .....
= 11 *cm*	= 7.5 *cm*	= ..... *m*

Practice 1

1. Show the diameter, chord, radius and the centre of the circle in the following figure :



(1)	Centre of the circle		(3)	Diameter	
(2)	Radius		(4)	Chord	

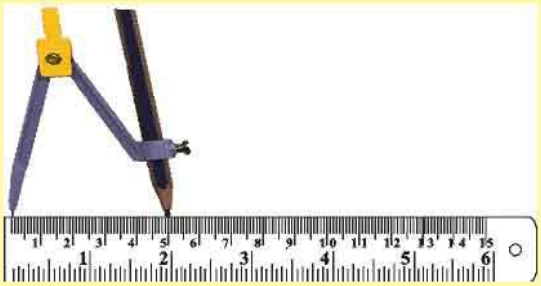
2. Complete the following table by filling in the missing information :

Sr. No.	Radius	Diameter	Sr. No.	Radius	Diameter	Sr. No.	Radius	Diameter
(1)	6 *m*	.....	(5)	8 *cm*	.....	(9)	10 *m*	.....
(2)	.....	16 *cm*	(6)	.....	20 *cm*	(10)	.....	8 *m*
(3)	3.8 *cm*	.....	(7)	8.1 *m*	.....	(11)	2.4 *m*	.....
(4)	.....	70 *cm*	(8)	.....	14 *m*	(12)	.....	11 *m*

• Draw a circle with the help of the given radius :

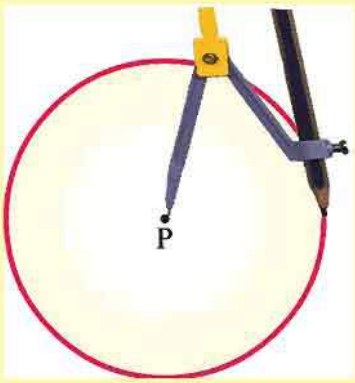
Example 7 : Construct a circle of radius 5 *cm* using a compass.

Step 1 :
Open the compass and arrange it on a scale in such a way that the distance between the pointer of the compass and the tip of the pencil remain is 5 *cm*.



Step 2 :
Place the compass precisely on the plain paper.

Step 3 :
Fixing the pointer of the compass and rotating the pencil accordingly will make a circle. Name the centre of the circle as P.



Practice 2

Draw circles of the given radii by using compass :

(1) 3 *cm* (2) 4.5 *cm* (3) 6 *cm* (4) 5 *cm* (5) 3.5 *cm*

Exercise

1. Find diameter corresponding to given radius.

   (1) 11 *cm* (2) 4.5 *cm* (3) 2.75 *m*

2. Find radius corresponding to the given diameter.

   (1) 7 *m* (2) 40 *cm* (3) 22 *cm*

3. Draw the circles of the given radii by using compass.

   (1) 5.5 *cm* (2) 4 *cm* (3) 3.5 *cm*

Practice 1

1. (1) O (2) $\overline{OX}$, $\overline{OP}$, $\overline{OQ}$ (3) $\overline{PQ}$ (4) $\overline{PQ}$, $\overline{RS}$

2. (1) 12 *m* (2) 8 *cm* (3) 7.6 *cm* (4) 35 *cm*
   (5) 16 *cm* (6) 10 *cm* (7) 16.2 *m* (8) 7 *m*
   (9) 20 *m* (10) 4 *m* (11) 4.8 *m* (12) 5.5 *m*

Exercise

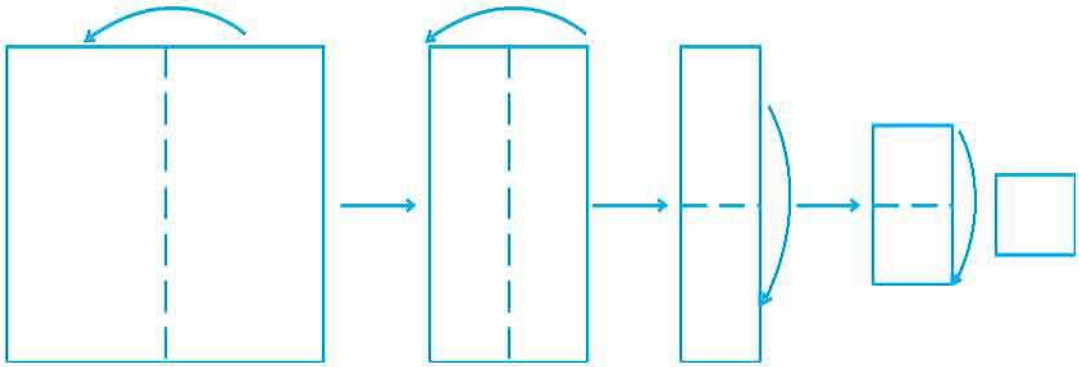
1. (1) 22 *cm* (2) 9 *m* (3) 5.50 *m*

2. (1) 3.5 *m* (2) 20 *cm* (3) 11 *cm*

11 Fraction

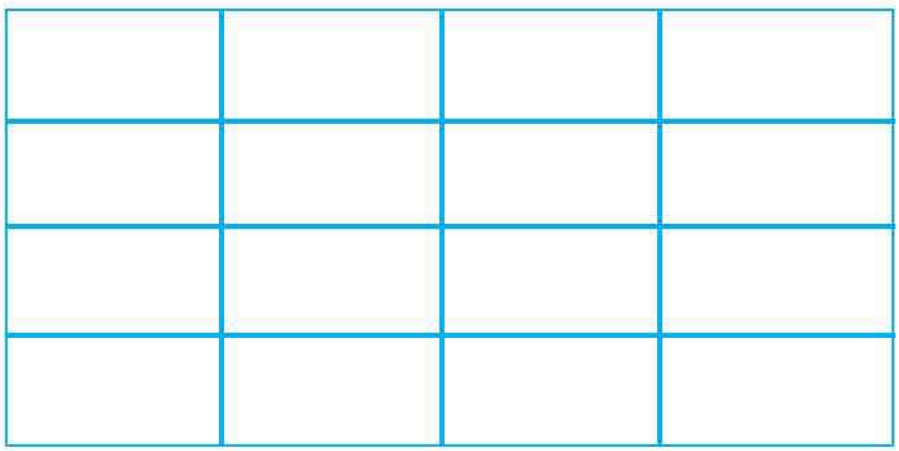
☞ **Let us recall :**

1. Take a square or a rectangular piece of paper and fold it as shown below :



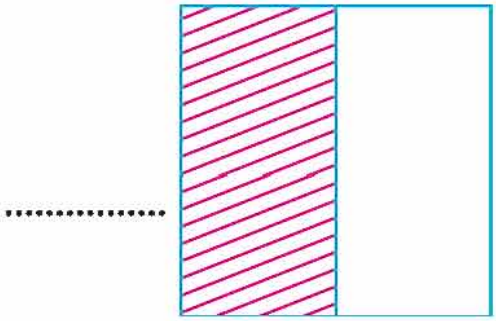
Now, unfold the paper, draw a line on each fold. Doing this, we get a figure of 16 blocks of equal size.

Now, fill in $\frac{1}{16}$ th part of the paper with red colour, $\frac{3}{16}$ th part with green colour, $\frac{5}{16}$ th part with yellow colour and the remaining part of the paper with saffron colour. Now, fill in colour in the following table also in the same manner :

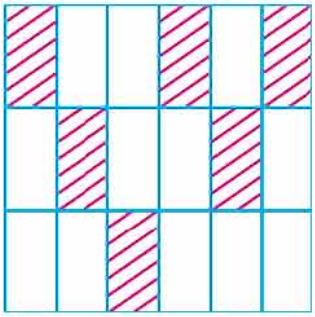


- The saffron colour shows _____ part of the paper.

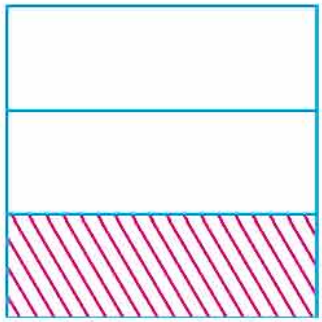
2. Find equal fractions from the following figures :



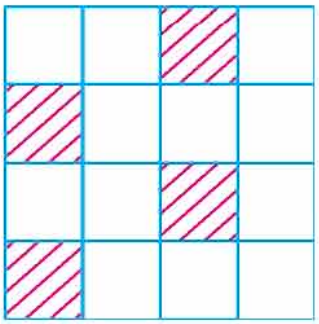
(i)



(a)

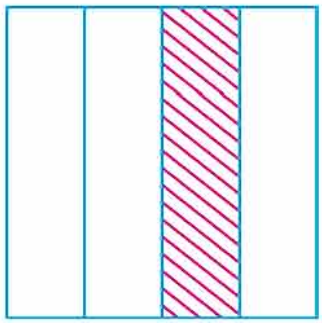


(ii)



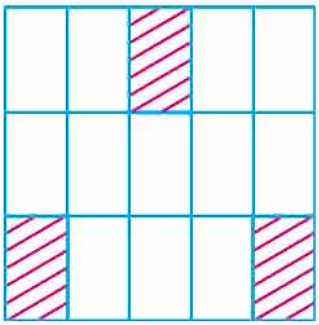
(b)

$\frac{4}{16}=\frac{1}{4}$

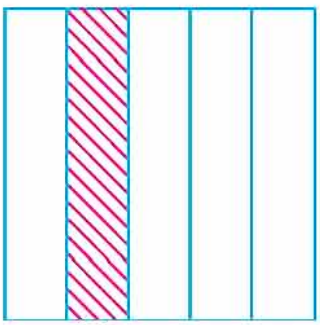


(iii)

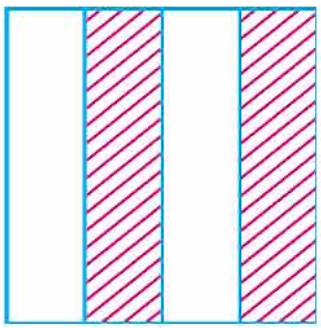
$\frac{1}{4}$



(c)



(iv)



(d)

3. Put an appropriate symbol from '<', '>' or '=' in ☐ in the following statements :

(1) $\frac{3}{7}$ ☐ $\frac{6}{7}$ (2) $\frac{2}{5}$ ☐ $\frac{2}{5}$ (3) $\frac{8}{11}$ ☐ $\frac{3}{11}$

(4) $\frac{3}{17}$ ☐ $\frac{13}{17}$ (5) $\frac{9}{8}$ ☐ $\frac{14}{8}$ (6) $\frac{15}{9}$ ☐ $\frac{13}{9}$

☞ **Let us Learn Something New :**

☞ **Reduced form of a fraction**

2	6
3	3
	1

$6 = 2 \times 3$

3	9
3	3
	1

$9 = 3 \times 3$

- $\frac{6}{9}$ can be written as $\frac{2\times3}{3\times3}$

$= \frac{2\times\cancel{3}}{3\times\cancel{3}}$ (removing the common factor from the numerator and the denominator)

$= \frac{2}{3}$

$\therefore$ The reduced form of $\frac{6}{9}$ is $\frac{2}{3}$.

- The reduced form of $\frac{12}{18}, \frac{24}{36}, \frac{20}{30}, \frac{36}{54}$ is $\frac{2}{3}$, isn't it ? Verify it.

$\frac{12}{18}$	$\frac{24}{36}$	$\frac{20}{30}$	$\frac{36}{54}$

Now, give few more examples of fractions which has $\frac{2}{3}$ as their reduced form .

- $\frac{6}{10} = \frac{2\times3}{2\times5}$ (factorizing numerator and denominator into primes)

$= \frac{\cancel{2}\times3}{\cancel{2}\times5}$ (removing common factors)

$= \frac{3}{5}$

$\therefore$ The reduced form of $\frac{6}{10}$ is $\frac{3}{5}$.

- The reduced form of $\frac{9}{15}, \frac{12}{20}, \frac{18}{30}, \frac{30}{50}$ is $\frac{3}{5}$, Isn't it ? Verify it.

$\frac{9}{15}$	$\frac{12}{20}$	$\frac{18}{30}$	$\frac{30}{50}$

How many such fractions are there which has reduced from as $\frac{3}{5}$?

☞ **To get the reduced form of a fraction :**

- Factorize the numerator and the denominator of the fraction in primes.
- Remove the common factors of the numerator and the denominator.
- The fraction obtained at last is the reduced form of that fraction.

Practice 1

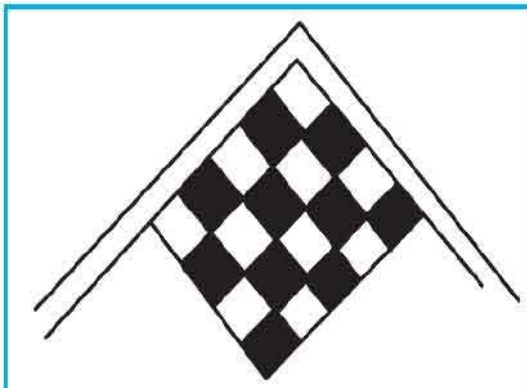
1. Obtain the reduced form :

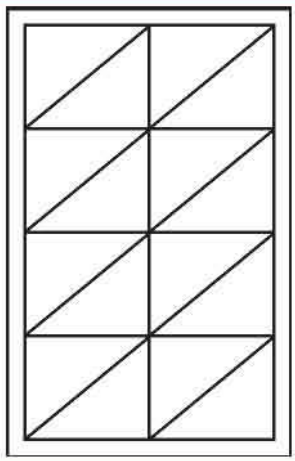
(1) $\frac{4}{16}$	(2) $\frac{18}{27}$	(3) $\frac{22}{55}$
(4) $\frac{39}{52}$	(5) $\frac{90}{50}$	(6) $\frac{36}{76}$

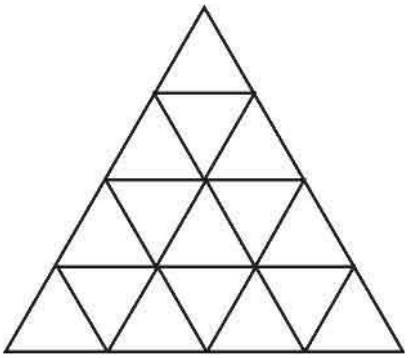
☞ **Let us recall :**

Like fractions :

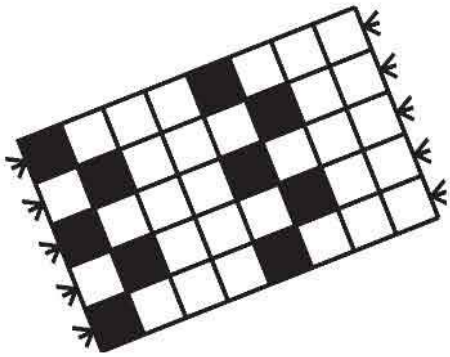
1. **Colour $\frac{1}{2}$ part of each of the following figures.**

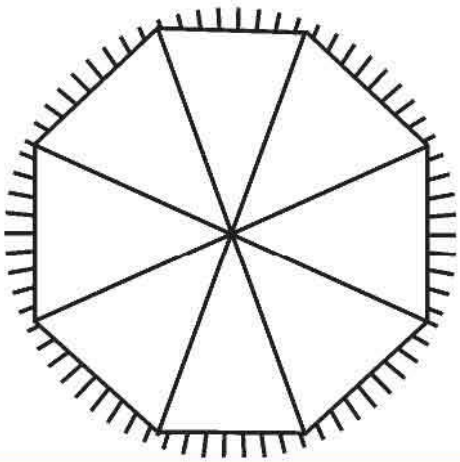


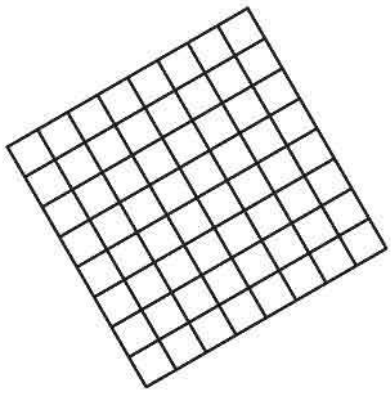




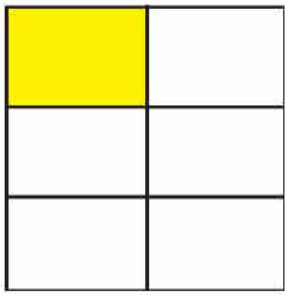
2. **Colour $\frac{1}{4}$th part of each of the following figures.**

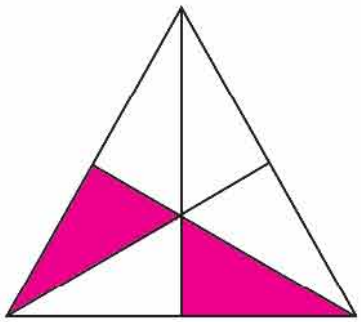


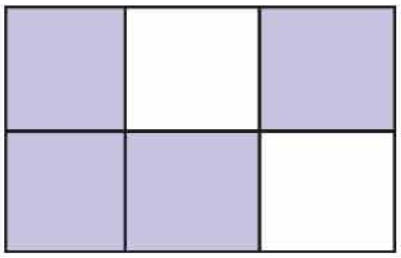


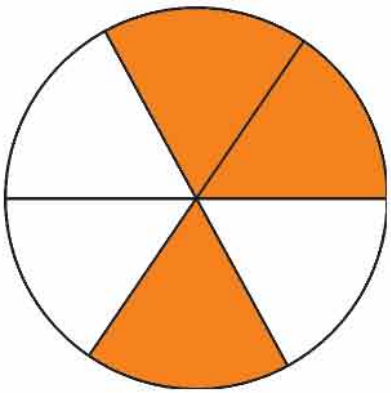


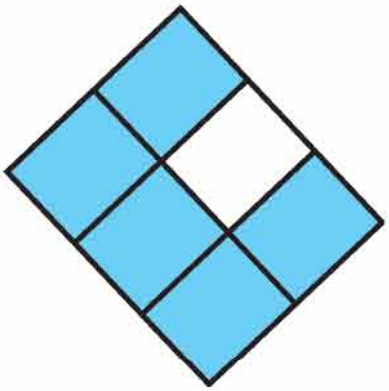
3. Show the coloured part of following figures as a fraction :











☞ **Think and say :**

(1) Which is the largest fraction among all the given fractions ? _____

(2) Which is the smallest fraction among all ? _____

(3) Which are the fractions greater than $\frac{1}{6}$? _____

(4) Which are the fractions smaller than $\frac{4}{6}$? _____

(5) Which fraction is greater than $\frac{2}{6}$ and smaller than $\frac{4}{6}$? _____

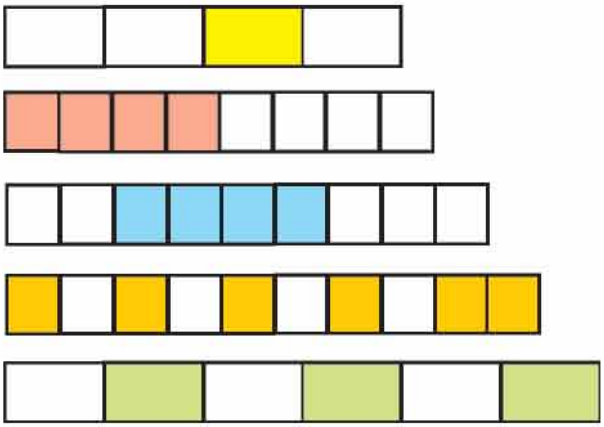
What can be said about the denominators of all these fractions ?

_____

The fractions having equal denominator are known as Like fractions.

- **Unlike fractions :**

Which fraction is indicated by the coloured part in each of the following figures :



_____

_____

_____

_____

_____

Observe carefully. All the fractions do not have the same denominator here. The fractions, not having the same denomienator, are said to be unlike fractions.

- **Let us learn something new :**
- **Addition of like fractions :**

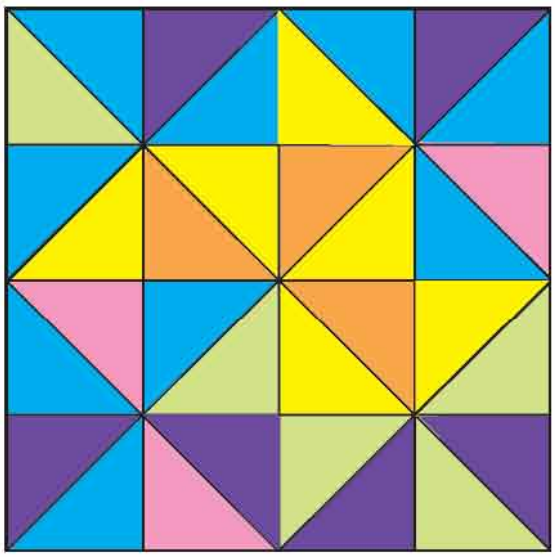
$\frac{1}{4} + \frac{1}{4} + \frac{1}{4} = \frac{3}{4}$

$\longleftarrow \frac{3}{4} \longrightarrow$

$\frac{1}{3} + \frac{1}{3} = \frac{2}{3}$

$\longleftarrow \frac{2}{3} \longrightarrow$

- **Fill in the blanks using the following figure :**



(1) There are 32 triangles with equal dimensions in the figure.

(2) Here, the number of ▲ is _____. They occupy _____ part of the whole figure.

(3) Here, the number of ▲ is _____. They occupy _____ part of the whole figure.

(4) Here, the number of is _____. They occupy _____ part of the whole figure.

(5) Here, the number of  is _____. They occupy _____ part of the whole figure.

(6) How much part of the whole figure is occupied by  and  both ? What will you do to know this ?

- **Observe and understand :**

The pink triangles occupy $\frac{3}{32}$ part and the sky-blue triangles occupy $\frac{9}{32}$ part of the figure. How much part of the whole figure is occupied by these two kinds of triangles ? To know this, we need to do the addition of them.

$$\frac{3}{32} + \frac{9}{32}$$

$= \frac{3+9}{32}$ (The sum of numerators of both the fractions is the numerator and their common denominator is the denominator of the resulting fraction)

$= \frac{12}{32}$

$= \frac{2\times2\times3}{2\times2\times2\times2\times2} = \frac{3}{8}$

$\therefore \frac{3}{32} + \frac{9}{32} = \frac{3}{8}$

It can be done this way as well :

$\frac{3\times4}{8\times4} = \frac{3}{8}$

Thus, the pink and sky-blue triangles occupy $\frac{3}{8}$ th part of the whole figure.

In the addition of like fractions, the sum of all the numerators becomes the numerator and denominator remains the same. i.e. there is no change in the denominator.

Example 1 : $2\frac{1}{5} + 1\frac{2}{5}$

Solution : Method 1 :

$= 2 + \frac{1}{5} + 1 + \frac{2}{5}$

$= 2 + 1 + \frac{1}{5} + \frac{2}{5}$

$= 3 + \frac{1}{5} + \frac{2}{5}$

$= 3 + \frac{1+2}{5}$

$= 3 + \frac{3}{5} = 3\frac{3}{5}$

Method 2 :

$= 2\frac{1}{5} + 1\frac{2}{5}$

$= \frac{11}{5} + \frac{7}{5}$ (making improper fraction)

$= \frac{11+7}{5}$

$= \frac{18}{5} = 3\frac{3}{5}$

$\therefore 2\frac{1}{5} + 1\frac{2}{5} = 3\frac{3}{5}$

Example 2 : $\frac{5}{11} + \frac{3}{11} + \frac{7}{11}$

Solution : $\frac{5}{11} + \frac{3}{11} + \frac{7}{11}$

$= \frac{5+3+7}{11}$

$= \frac{15}{11}$

$= 1\frac{4}{11}$

$\therefore \frac{5}{11} + \frac{3}{11} + \frac{7}{11} = 1\frac{4}{11}$

Practice 2

1. Add :

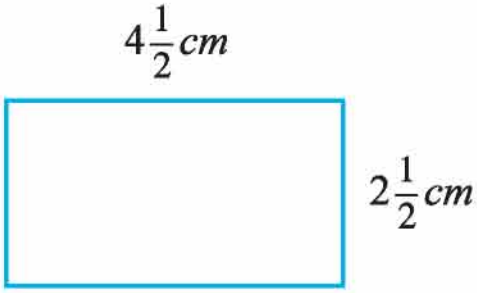
(1) $\frac{13}{24} + \frac{10}{24}$

(2) $\frac{3}{7} + 1\frac{2}{7}$

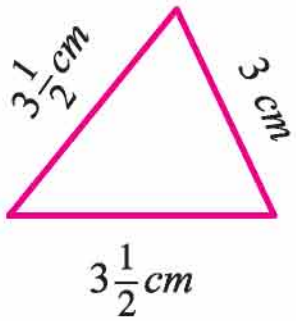
(3) $\frac{7}{23} + \frac{8}{23}$

(4) $4\frac{2}{5} + 3\frac{4}{5}$

2. Find the perimeter of the rectangle given below :



3. Find the perimeter of the triangle given below :



4. Select any two fractions from the table given below and write their sum in your notebook.

$\frac{1}{8}$	$\frac{7}{8}$	$\frac{3}{8}$	$\frac{4}{8}$
$\frac{5}{8}$	$\frac{2}{8}$	$\frac{6}{8}$	$\frac{7}{8}$
$\frac{3}{8}$	$\frac{4}{8}$	$\frac{5}{8}$	$\frac{2}{8}$

(1) How many such pairs of fractions can you make ?

(2) Which is the largest fraction among the sums you have obtained ?

(3) Which is the smallest fraction you have obtained ?

Think....

Is it a magic square ? How ?

$\frac{2}{17}$	$\frac{7}{17}$	$\frac{6}{17}$
$\frac{9}{17}$	$\frac{5}{17}$	$\frac{1}{17}$
$\frac{4}{17}$	$\frac{3}{17}$	$\frac{8}{17}$

(1) What is the sum of fractions in each row ? _____

(2) What is the sum of fractions in each column ? _____

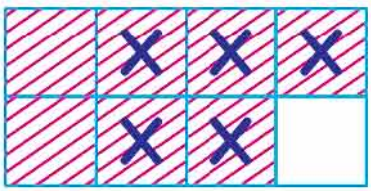
(3) Make such 3×3 magic square on your own.

• Subtraction of like fractions :

☞ **Observe and understand :**

Example 3 : $\frac{7}{8} - \frac{5}{8}$

Solution :



$$\frac{7}{8} - \frac{5}{8}$$

$$= \frac{7-5}{8}$$

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

$$= \frac{1}{4}$$

$$\therefore \frac{7}{8} - \frac{5}{8} = \frac{1}{4}$$

Example 4 : $\frac{5}{6} - \frac{2}{6}$

Solution :

$$\frac{5}{6} - \frac{2}{6}$$

$$= \frac{5-2}{6}$$

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

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

$$\therefore \frac{5}{6} - \frac{2}{6} = \frac{1}{2}$$

Practice 3

1. Subtract :

(1) $\frac{6}{9} - \frac{2}{9}$ (2) $\frac{5}{7} - \frac{3}{7}$ (3) $\frac{11}{29} - \frac{8}{29}$

(4) $3\frac{4}{8} - \frac{19}{8}$ (5) $2\frac{3}{19} - 1\frac{5}{19}$ (6) $3\frac{5}{17} - 2\frac{4}{17}$

2.

⊖ →		
⊖ ↓ $\frac{8}{23}$	$\frac{3}{23}$	
$\frac{4}{23}$	$\frac{2}{23}$	

3.

⊕ →		
⊖ ↓ $\frac{5}{13}$	$\frac{7}{13}$	
$\frac{2}{13}$	$\frac{5}{13}$	

☞ Conversion of decimal fraction into simple (vulgar) fraction and vice versa :

• Conversion of decimal fraction into simple fraction :

☞ **Observe and Understand :**

Sr. No.	Decimal fraction	Simple fraction
(1)	0.1	$\frac{1}{10}$
(2)	0.7	.....
(3)	0.03	$\frac{3}{100}$
(4)	0.05	.....
(5)	0.21	$\frac{21}{100}$
(6)	4.7	.....
(7)	10.17	$\frac{1017}{100} = 10\frac{17}{100}$
(8)	31.19	.....
(9)	0.009	$\frac{9}{1000}$
(10)	0.007	.....
(11)	0.141	$\frac{141}{1000}$
(12)	10.343	$\frac{10343}{1000} = 10\frac{343}{1000}$
(13)	3.781	.....

While converting the decimal fraction into simple fraction, if the fraction is not in the reduced form, then its reduced form is obtained. e.g.,

$$0.6 = \frac{6}{10} = \frac{2\times3}{2\times5} = \frac{3}{5}$$

$$0.75 = \frac{75}{100} = \frac{3\times5\times5}{4\times5\times5} = \frac{3}{4}$$

$$3.125 = 3\frac{125}{1000} = 3\frac{5\times5\times5\times1}{5\times5\times5\times8} = 3\frac{1}{8}$$

- **Conversion of a simple fraction into a decimal fraction :**

Simple fraction	Decimal fraction
$\frac{3}{10}$	0.3
$\frac{18}{100}$	0.18
$3\frac{675}{1000}$	3.675
$\frac{1}{2}$	$\frac{1\times5}{2\times5} = \frac{5}{10} = 0.5$
$\frac{7}{2}$	.....
$\frac{19}{25}$	$\frac{19\times4}{25\times4} = \frac{76}{100} = 0.76$
$1\frac{12}{25}$	.....
$5\frac{4}{125}$	$5\frac{4\times8}{125\times8} = 5\frac{32}{1000} = 5.032$
$7\frac{2}{125}$	.....

$2\frac{11}{20}$	$2\frac{11\times5}{20\times5} = 2\frac{55}{100} = 2.55$
$7\frac{2}{25}$	.....
$\frac{7}{40}$	$\frac{7\times25}{40\times25} = \frac{175}{1000} = 0.175$
$\frac{3}{40}$	.....

If the denomenator of a fraction does not contain 10, 100 or 1000, then multiply numerator and denominator by an appropriate number to convert the denominator into 10, 100 or 1000.

☞ **Decimal fraction in the units of currency, length, weight and volume :**

Measure	Relation between units	In the form of decimal fraction
Currency	₹ 1 = 100 paise	30 paise = ₹ 0.30 3 rupees 50 paise = ₹ 3.50 705 paise = ₹ 7.05 15 rupees 5 paise = ₹ 15.05
Length	1 meter = 100 centimetres Meter can be abbreviated as *m*. Centimetre can be abbreviated as *cm*. 1 kilometer = 1000 meters Kilometer can be abbreviated as *km*.	45 *cm* = 0.45 *m* 348 *cm* = 3.48 *m* 17 meter 45 *cm* = 17.45 *m* 8 *cm* = 0.08 *m* 9 *km* 450 *m* = 9.450 *km* 18 *km* 18 *m* = 18.018 *km* 3 *km* 7*m* = 3.007 *km* 4278 *m* = 4.278 *km*

Weight	1 kilogram = 1000 grams Kilogram can be abbreviated as *kg*.	13 grams = 0.013 *kg* 7 kg 5 grams = 7.005 *kg* 3 kg 750 grams = 3.750 *kg* 4575 grams = 4.575 *kg*
Volume	1 litre = 1000 mililitres In short, mililitre can be writen as *ml*.	250 *ml* = 0.250 litre 5 litres 350 *ml* = 5.350 litres 7 litres 50 *ml* = 7.050 litres 3 litres 5 *ml* = 3.005 litres

Practice 4

1. Fill in the blanks by selecting an appropriate option and write in ☐ :

(1) 50 paise = ₹ _____ ☐

(A) 50 (B) 0.50 (C) 5.00 (D) 0.050

(2) 2 rupees 50 paise = ₹ _____ ☐

(A) 0.250 (B) 25 (C) 2.50 (D) 0.0250

(3) 18 grams = _____ kilogram. ☐

(A) 0.18 (B) 1.8 (C) 0.0018 (D) 0.018

(4) 2 *kg* 50 grams = _____ *kg* ☐

(A) 2.050 (B) 2.50 (C) 2.500 (D) 2.005

(5) 45*cm* = _____ meter ☐

(A) 4.5 (B) 0.45 (C) 0.405 (D) 4.05

(6) 9 meters 80*cm* = _____ meters ☐

(A) 90.80 (B) 9.080 (C) 9.80 (D) 980

(7) 8 meters = _____ kilometer

(A) 0.08 (B) 0.80 (C) 0.080 (D) 0.008

(8) 2 *km* 65 meters = _____ kilometers

(A) 2.65 (B) 2.065 (C) 2.650 (D) 26.5

(9) 9 *km* 750 meters = _____ kilometers

(A) 9.750 (B) 97.5 (C) 9750 (D) 90.750

(10) 500 millilitres = _____ litre

(A) 500 (B) 0.050 (C) 0.500 (D) 0.005

(11) 8 litres 25 *ml* = _____ litres

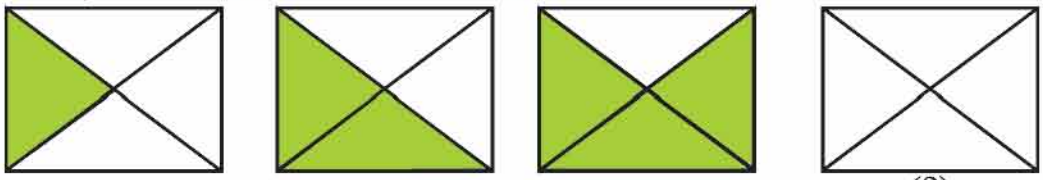
(A) 8.250 (B) 82.5 (C) 8.205 (D) 8.025

(12) 8 litres 8 *ml* = _____ litres

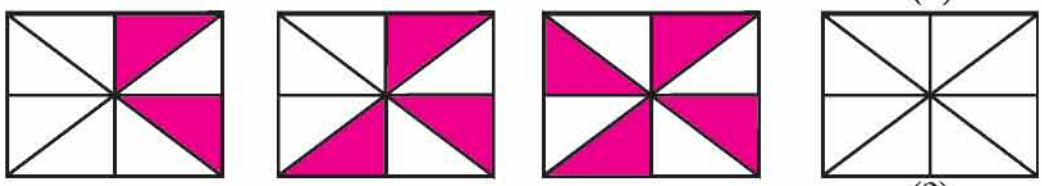
(A) 8.8 (B) 8 (C) 8.008 (D) 8.08

- **Observe, understand and fill in colour :**

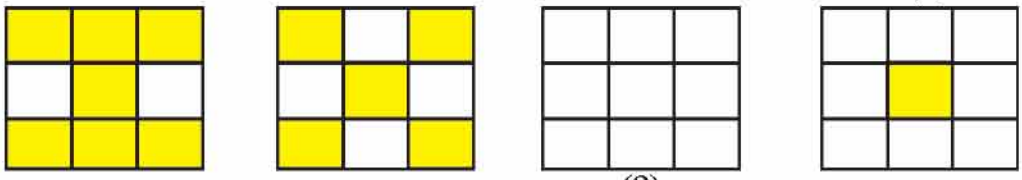
(1)



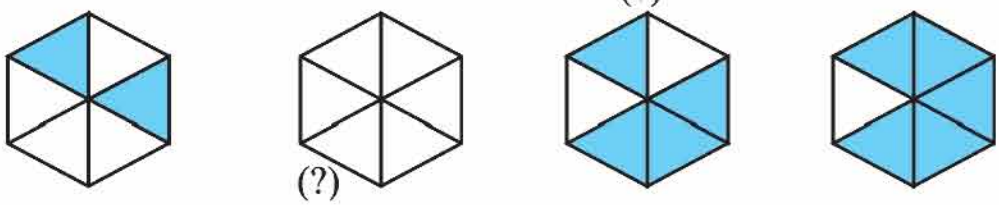
(2)



(3)



(4)



- **Understand and write :**

(1) $\frac{2}{7}, \frac{5}{7}, \frac{8}{7},$ ———

(2) $\frac{17}{23}, \frac{15}{23}, \frac{13}{23},$ ———

(3) $\frac{9}{17},$ ———, $\frac{13}{17}, \frac{15}{17}$

(4) $\frac{21}{43},$ ———, $\frac{31}{43}, \frac{36}{43}$

Exercise

1. Obtain in reduced form :

(1) $\frac{6}{20}$ (2) $\frac{14}{56}$ (3) $2\frac{2}{10}$ (4) $\frac{35}{49}$

2. Add :

(1) $\frac{3}{5} + \frac{4}{5}$ (2) $\frac{4}{7} + 1\frac{4}{7}$ (3) $\frac{13}{19} + \frac{7}{19}$ (4) $2\frac{3}{7} + 1\frac{4}{7} + \frac{5}{7}$

3. Subtract :

(1) $\frac{7}{8} - \frac{3}{8}$ (2) $\frac{11}{13} - \frac{5}{13}$ (3) $\frac{9}{16} - \frac{3}{16}$ (4) $3\frac{2}{15} - 1\frac{1}{15}$

4. Convert in simple fraction form :

(1) 0.005 (2) 0.64 (3) 23.5 (4) 13.037

5. Convert in decimal fraction form :

(1) $\frac{13}{100}$ (2) $\frac{403}{1000}$ (3) $2\frac{1}{5}$ (4) $\frac{37}{200}$

6. Fill in the blanks :

(1) 425 paise = ₹ _____

(2) 88 *cm* = _____ meter

(3) 7 *kg* 250 grams = _____ *kg*

(4) 1765 grams = _____ *kg*

(5) 3 litre 500 millilitres = _____ litres

Practice 1

1. (1) $\frac{1}{4}$ (2) $\frac{2}{3}$ (3) $\frac{2}{5}$ (4) $\frac{3}{4}$ (5) $1\frac{4}{5}$ (6) $\frac{9}{19}$

Practice 2

1. (1) $\frac{23}{24}$ (2) $1\frac{5}{7}$ (3) $\frac{15}{23}$ (4) $8\frac{1}{5}$ **2.** 14 cm **3.** 10 cm

Practice 3

1. (1) $\frac{4}{9}$ (2) $\frac{2}{7}$ (3) $\frac{3}{39}$ (4) $1\frac{1}{8}$ (5) $\frac{17}{19}$ (6) $1\frac{1}{17}$

2.

$\frac{8}{23}$	$\frac{3}{23}$	$\frac{5}{23}$
$\frac{4}{23}$	$\frac{2}{23}$	$\frac{2}{23}$
$\frac{4}{23}$	$\frac{1}{23}$	$\frac{3}{23}$

3.

$\frac{5}{13}$	$\frac{7}{13}$	$\frac{12}{13}$
$\frac{2}{13}$	$\frac{5}{13}$	$\frac{7}{13}$
$\frac{3}{13}$	$\frac{2}{13}$	$\frac{5}{13}$

Practice 4

1. (1) B (2) C (3) D (4) A

(5) B (6) C (7) D (8) B

(9) A (10) C (11) D (12) C

Exercise

1. (1) $\frac{3}{10}$ (2) $\frac{1}{4}$ (3) $2\frac{1}{5}$ (4) $\frac{5}{7}$

2. (1) $1\frac{2}{5}$ (2) $2\frac{1}{7}$ (3) $1\frac{1}{19}$ (4) $4\frac{5}{7}$

3. (1) $\frac{1}{2}$ (2) $\frac{6}{13}$ (3) $\frac{3}{8}$ (4) $2\frac{1}{15}$

4. (1) $\frac{5}{1000}$ (2) $\frac{64}{100}$ (3) $23\frac{5}{10}$ (4) $13\frac{37}{1000}$

5. (1) 0.13 (2) 0.403 (3) 2.2 (4) 0.185

6. (1) 4.25 (2) 0.88 (3) 7.250 (4) 1.765 (5) 3.500

Revision : 3

1. Match the following :

A	B
(1) To switch on a calculator	(a) ⊡
(2) To mention decimal point	(b) AC
(3) To get the final result of the calculation	(c) ON
(4) To clear all the digits from the display screen	(d) CE
(5) To cancel the wrong entry without cancelling the whole calculation	(e) ÷ (f) =

2. Do the calculations and fill in the blanks :

(1) Average is also known as _____

(2) Average of the first five consecutive even numbers is _____ .

(3) Average of the first three multiples of 6 is _____ .

(4) Average of 21, 22, 23, 24 and 25 is _____ .

(5) Average of the factors of 20 is _____ .

3. Complete the following table by writing the missing terms :

Diameter	13 *cm*	.....	94 *cm*	.....	10 metres	50 *cm*
Radius	.....	7 metres	.....	4.5 *cm*	.....	.....

4. Draw a circle of the given radius by using compass :

(1) 3 *cm* (2) 5.2 *cm* (3) 6.5 *cm*

5. The fraction given in the smaller table is the reduced form of some fraction / fractions. Find it/them from the larger table and colour the block of fraction in larger table with the same colour given in the smaller table :

$\frac{1}{2}$	$\frac{3}{4}$	$\frac{4}{5}$	$\frac{2}{7}$

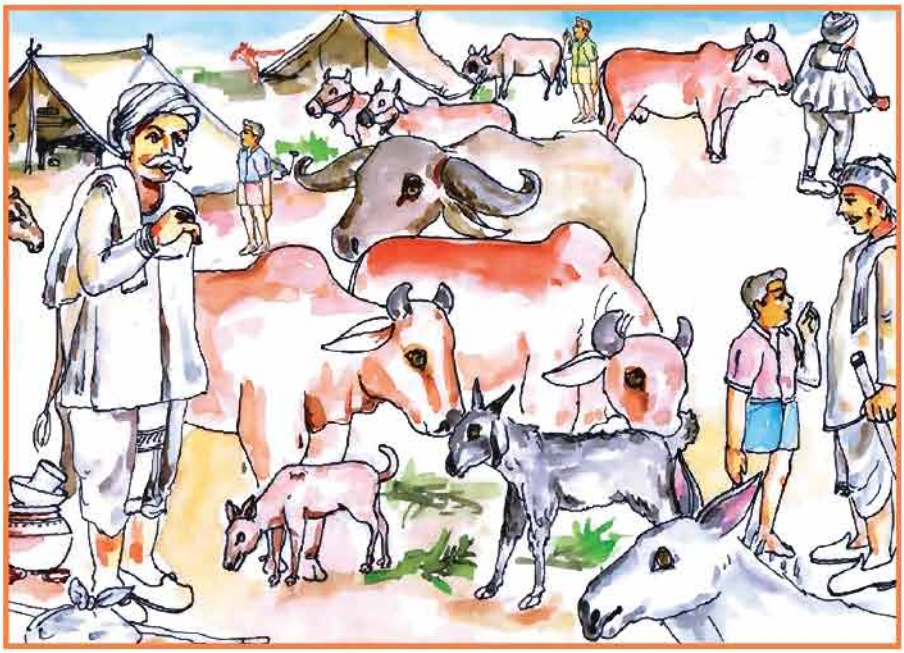
$\frac{4}{14}$	$\frac{3}{6}$	$\frac{6}{8}$	$\frac{4}{8}$	$\frac{6}{21}$
$\frac{2}{4}$	$\frac{9}{12}$	$\frac{8}{10}$	$\frac{12}{16}$	$\frac{5}{10}$
$\frac{10}{20}$	$\frac{12}{15}$	$\frac{15}{20}$	$\frac{16}{20}$	$\frac{6}{12}$
$\frac{10}{35}$	$\frac{9}{18}$	$\frac{24}{30}$	$\frac{7}{14}$	$\frac{8}{28}$

6. Make the pairs of the like fractions from the above table, add and subtract them.

Answers

1. (1) → (c) , (2) → (a), (3) → (f), (4) → (b), (5) → (d).
2. (1) Mean (2) 6 (3) 12 (4) 23 (5) 7
3. 6.5 *cm*, 14 metres, 47 *cm*, 9 *cm*, 5 metres, 25 *cm*

12 Profit and Loss



Uncle : Hello children, how come you are here ?

Ujas : Uncle, we heard of a fair here. So, we came here to roam around. But this seems to be a fair of different kind. Here, people have come with animals like cows, buffalos, horses, goats, bullocks and dogs.

Uncle : Yes, this is an animal fair. Every year, an animal fair is organised here. People from different regions come here to sell and buy animals.

Ujas : Uncle, how do they decide the price of the animals ?

Uncle : A buyer studies the animal carefully. The price of the animals who give milk is decided on the basis of their breed, age and the quantity of milk they give at a time.

Ujas : Oh, ok...

Uncle : The price of a bullock is decided on the basis of its appearance, age and health. The price of a horse is decided from its kind, speed of running and some other peculiar qualities.

Ujas : Wow... This is something new, I came to know.

Uncle : Hey Motibhai ! How much did you pay for this cow ?

Motibhai : I bought this *Kankareji* cow for ₹ 22,000 only.

Uncle : Good ! will you keep this cow for yourself or will you sell it to some one else at your village ?

Motibhai : No... no. I will keep it for myself.

Ujas : Uncle, do you visit this fair every year ?

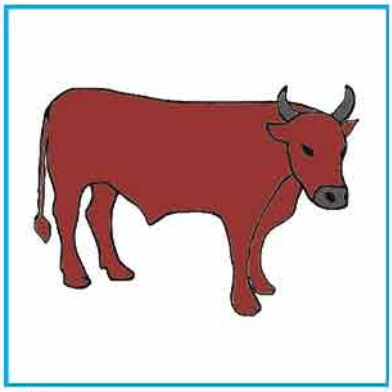
Uncle : Yes, I come here every year and buy and sell many animals.

Ujas : What did you buy and sell this time ?

Uncle : See, I made the following deals.

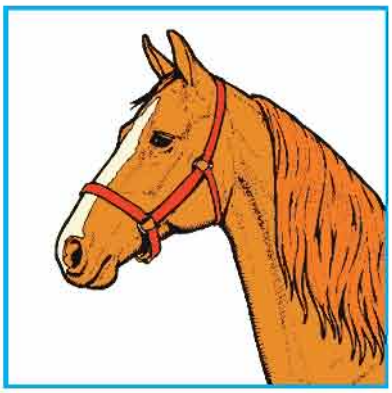
Bought for ₹ 2000
Sold for ₹ 2200
[ ] [Profit]

Bought for ₹ 27000
Sold for ₹ 25000
[ ] [Loss]



Bought for ₹ 28000
Sold for ₹ 30000
[ ] [ ]

Bought for ₹ 38000
Sold for ₹ 41000
[ ] [ ]



Bought for ₹ 44000
Sold for ₹ 51000
[ ] [ ]

Bought for ₹ 1600
Sold for ₹1500
[ ] [ ]

- Advantage means profit
- Loosing mean Loss
- At the price an object is purchased is called its buying price or original price.
- At the price an object is sold is called its selling price.

- Now, from the above examples, find out buying price and selling price and write them in the following table. Compare them and apply proper symbol '<' or '>' in ◯. Fill in the boxes.

Animal	Buying Price	Compare	Selling Price	Profit or loss	How much
Goat	₹	◯	₹		
Cow	₹	◯	₹		
Buffalo	₹	◯	₹		
Dog	₹	◯	₹		
Bullock	₹	◯	₹		
Horse	₹	◯	₹		

When, selling price is more than buying price, we get profit. So,

Profit = selling price − buying price

Profit = selling price − original price

When the selling price is less than buying price, we incur loss. So,

Loss = buying price − selling price

Loss = original price − selling price

Practice 1

1. Mention buying price and selling price :

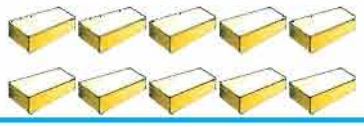
(1) A pen bought for ₹ 5 is sold at ₹ 6.

(2) Curd bought for ₹ 70 is sold at ₹ 80.

(3) Cloth bought for ₹ 350 is sold at ₹ 450.

(4) Vegetables bought for ₹ 680 is sold at ₹ 640.

2. Fill in the blanks :

Index	Object	Buying price	Selling price	Profit or loss	How much
(1)		₹ 17	₹ 20	.....	.....
(2)		₹ 18	₹ 20	.....	.....
(3)		₹ 12	₹ 15	.....	.....
(4)		₹ 24	₹ 30	.....	.....
(5)		₹ 60	₹ 66	.....	.....
(6)		₹ 20	₹ 18	.....	.....
(7)		₹ 90	₹ 100	.....	.....
(8)		₹ 65	₹ 60	.....	.....

Ujas : Uncle ! Do you sell which you have bought from here the animals at any other places ?

Uncle : Yes, I sold the animals which I had bought from here at any other village.

Ujas : How did you transport them there ?

Uncle : First of all, I bought a pair of bullocks for ₹ 37,000 here. I paid ₹ 700 as rent for a tempo for transportation to another village. Then I sold this pair for ₹ 44,000.

(1) How much did uncle pay for a pair of bullocks ?

_____

_____

(2) How much did uncle pay for the rent of tempo ?

_____

_____

(3) How much additional expense did the uncle make other than the buying price for the pair of bullocks ?

_____

_____

Here, ₹ 700 is an additional expense. Adding it to buying price we get cost price.

₹ 37,000 + ₹ 700 = ₹ 37,700

Generally, few more expenses are made other than the buying cost; like transportation expense, repairing expense, colour, labour etc. All such expenses are called additional expenses.

Cost price = Buying price + Additional expenses

- In practice, we calculate Profit or Loss considering the cost price and the selling price.

Profit = selling price – cost price
Loss = cost price – selling price

Ujas : So, uncle, you made a profit of

₹ 44,000 – ₹ 37,700 = ₹ 6,300 on the sale of a pair of bullocks.

Example 1 : A merchant bought some pots for ₹ 3000. The transport expense to carry them to a city came down to ₹ 300. He sold all the pots for ₹ 3200. How much would he gain or lose ?

Solution : Buying price = ₹ 3000

Additional expense = ₹ 300

∴ Cost price of the pots = buying price + additional expense

= ₹ 3000 + ₹ 300

= ₹ 3300

Here, the cost price > the selling price

∴ Amount of loss = cost price – selling price

= ₹ 3300 – ₹ 3200

= ₹ 100

∴ The merchant incurred a loss of ₹ 100.

Example 2 : A merchant bought crackers worth ₹ 7000. The transport expenses to carry them to his shop came down to ₹ 500. All the crackers were sold for ₹ 9800. Did he make any profit or incur loss in this deal ? How much ?

Solution : Buying price = ₹ 7000, Expense = ₹ 500,

Selling price = ₹ 9800

∴ Cost price of the crackers = buying price + additional expenses

= ₹ 7000 + ₹ 500

= ₹ 7500

Here, cost price < selling price

∴ So amount of profit = selling price – cost price

= ₹ 9800 – ₹ 7500

= ₹ 2300

∴ The merchant had a profit of ₹ 2300.

Practice 2

1. Fill in the blanks :

Index	Buying price	Additional expense	Cost price	Selling price	Profit or loss	How much
Example	₹ 1000	₹ 50	₹ 1050	₹ 1200	Profit	₹ 150
1	₹ 200	₹ 10	₹	₹ 230	.....	₹ .....
2	₹	₹ 200	₹ 1800	₹ 1900	.....	₹ .....
3	₹ 1700	₹ 170	₹	₹ 1750	.....	₹ .....
4	₹ 180	₹	₹ 200	₹ 190	.....	₹ .....
5	₹	₹ 200	₹	₹ 2400	Loss	₹ 200

2. An old refrigerator was purchased for ₹ 8000 and had to get repaired for ₹ 1100. If this refrigerator was sold for ₹ 8500, will this deal result in profit or loss ? How much ?

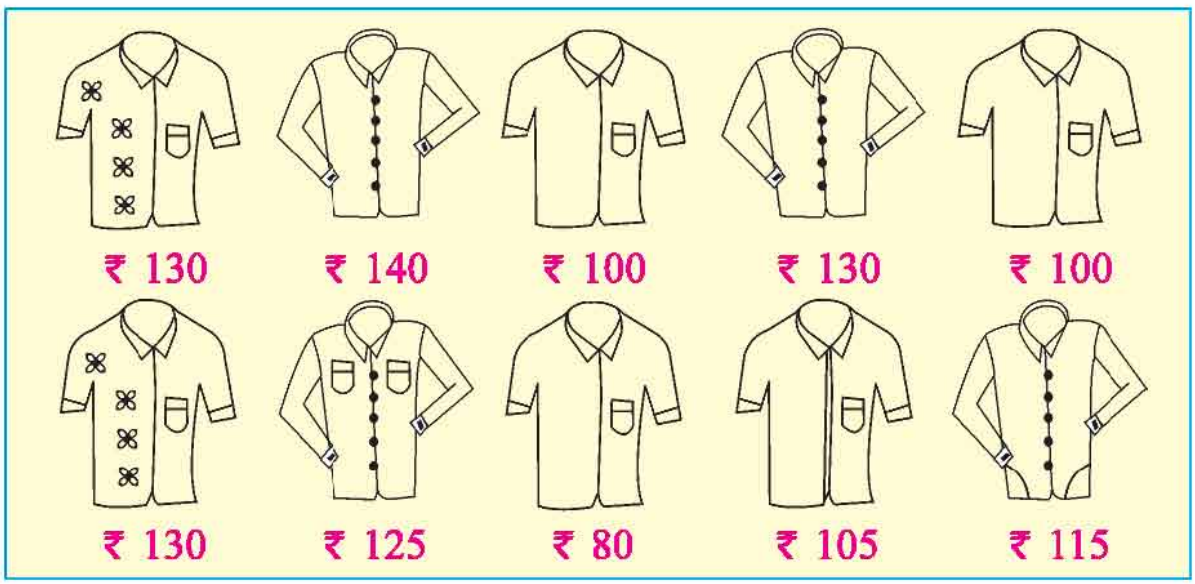
3. A phone was purchased for ₹ 2800 and its repairing cost came to ₹ 150. How much profit does it make if the mobile is sold for ₹ 3100 ?

Exercise

1. Sachin made a deal as follow. Depending upon the following table, calculate the profit or loss.

Purchase	Sale	Total income
10 water bags for ₹ 1700	1 water bag for ₹ 220	₹ .....
₹ 50 rickshaw fair	1 water bag for ₹ 190	₹ .....
(transportation)	3 water bags each for ₹ 195	₹ .....
	2 water bags each for ₹ 180	₹ .....
	3 water bags each for ₹ 160	₹ .....

2. A hawker bought 10 shirts for ₹ 1050. He sold them all as per the prices shown below. Answer the following questions :



(1) What is the buying price of 1 shirt ?

(2) Fill in saffron colour in the shirts which were sold with a profit of more than ₹ 20.

(3) Colour the shirt which was sold for profit between ₹ 10 to ₹ 20 with yellow.

(4) Colour the shirt which was sold for a profit less than ₹ 10 with green.

(5) Colour the shirt which is sold at a price less than the buying price with blue colour.

(6) Will there be a profit or loss in sale of all the shirts ?

(7) Colour the shirt pink if it is sold for neither profit nor loss.

Practice 1

O.P. = Original Price, S. P. = Selling Price

1. (1) O. P. = ₹ 5, S.P. = ₹ 6 (2) O.P. = ₹ 70, S.P. = ₹ 80

(3) O. P. = ₹ 350, S. P. = ₹ 450 (4) O. P. = ₹ 680, S. P. = ₹ 640

2. (1) Profit, ₹ 3 (2) Profit, ₹ 2 (3) Profit, ₹ 3

(4) Profit, ₹ 6 (5) Profit, ₹ 6 (6) Loss, ₹ 2

(7) Profit, ₹ 10 (8) Loss, ₹ 5

Practice 2

C.P. = Cost Price

1. (1) C. P. = ₹ 210, Profit = ₹ 20

(2) Buying price = ₹ 1600, Profit = ₹ 100

(3) C. P. = ₹ 1870, Loss = ₹ 120

(4) Additional expense = ₹ 20, Loss = ₹ 10

(5) Buying price = ₹ 2400, C.P. = ₹ 2600

2. Loss, ₹ 600

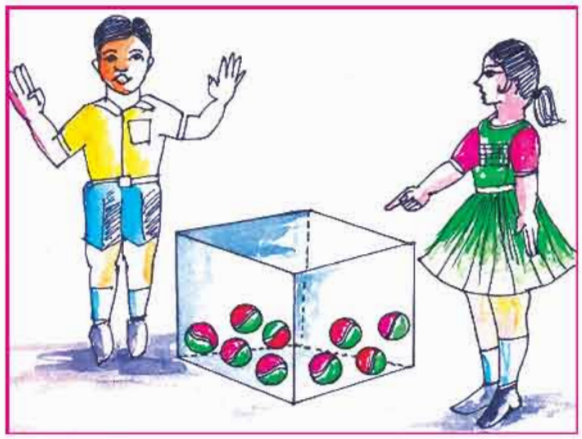
3. Profit, ₹ 150

Exercise

1. (1) Profit ₹ 85 **2.** (1) ₹ 105 (6) Profit ₹ 105

13 Unknown Numbers

- **Aesha and Krish are playing a game. Help them whenever needed and complete the dialogue.**



Aesha : (Showing a glass-box). Look, how many balls are there in the box ?

Krish : There are 9 balls in this box.

Aesha : Now, guess, how many chocolates would be here in this bag ?

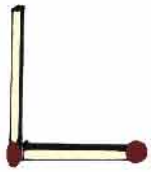
Krish : .....

.....

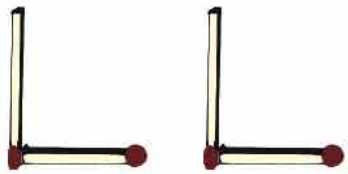
Aesha : Can you answer the exact number of chocolates in this bag ?
No.

- **The numbers known to us are called known numbers. For** example, 5, 6, 9,... etc.
- **If we cannot give a definite answer about a number, the number is called an unknown number.**

- Now, Aesha and Krish brings match-sticks. They decide to play with them. They decide to form English alphabets using match-sticks.
- Aesha forms English alphabet 'L' using match-sticks.



- Then, Krish also takes two match-sticks and form an 'L' besides the 'L' made by Aesha.



- Similarly, they make three 'L's.

- Their friend named Aman joins them while they were playing this game.

Aman : How many match-sticks are required to form 8 such 'L's ?

Aesha : To calculate the number of match-sticks required, we will calculate them, this way.

Number of Match-sticks required to form L = 2 × number of 'L's

$\therefore$ Number of match-sticks required to form 8 'L's = 2 × 8 = 16

$\therefore$ 16 match-sticks are required to form 8 'L's.

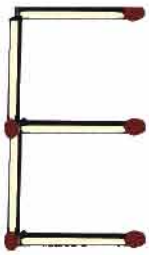
Krish : Suppose we do not know number of 'L's to be formed. How will we calculate the number of match-sticks to form some number of 'L's ?

Aesha : To form some number of 'L's, Let n represent the number of 'L's to be formed. Here, n is an unknown number for us.

The number of match-sticks required to form some 'L's = $2 \times n = 2n$

Taking n = 1, 2, 3, 4...., we can calculate number of match-sticks according to 1L, 2L, 3L, 4L,... respectively.

Now, they form 'E' by using match-sticks as shown below :



No. of 'E' formed	1	2	3	4	5	6	7	...	x
No. of match-sticks	5	10						...	$5x$

Here, x is an unknown number in $5x$.

x can take any value like x = 1, 2, 3, 4,.... English alphabets like *a, b, c,... x, y, z* are used to represent unknown numbers.

Aesha and Krish go to a book-store. In this book-store, an exercise book costs ₹ 25, a pen costs ₹ 2 and a compass-box costs ₹ 20.

(1) How much money does Aesha require to buy 10 pens ? _____

(2) How much money is required to buy x pen ? _____

(3) How much money is required to buy m pieces of exercise book ? _____

(4) How much money is required to buy y pieces of compass-box ? _____

As seen in examples, unknown numbers like x, y, z, a, b, c are multiplied by some number. For example $2 \times x = 2x$, $25 \times m = 25m$, $20 \times y = 20y$ etc. But this may not turn out to be the case in every situation. Sometimes, we may need to add or subtract an unknown number. For example,

(1) Kavita says, I have got 10 marbles more than Nilam has. This means if Nilam has 5 marbles, Kavita has 15 marbles. If Nilam has 25 marbles, Kavita has 35 marbles.

Number of marbles Kavita has = Number of marbles Nilam has + 10

If we do not know how many marbles does Nilam have;

let us show number of marbles Nilam has, by x.

$\therefore$ Number of Marbles Kavita has = $x + 10$

Think !
- If $x = 8$, how many marbles does Kavita have ? _____
- If $x = 8$, how many marbles does Nilam have ? _____

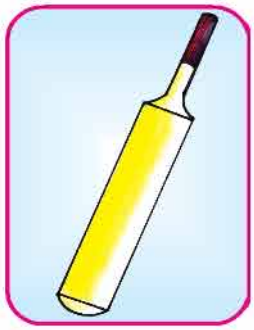
(2) Mahesh and Naresh are two brothers. Mahesh says to Naresh, 'you are 4 years younger to me'. i.e. if age of Mahesh is 10 years, age of Naresh is $10 - 4 = 6$ years. If Mahesh is 15 years old, Naresh is 11 years old. If we do not know the age of Mahesh, let us suppose that Mahesh is y years old at present.

$\therefore$ Age of Naresh = Age of Mahesh $- 4 = y - 4$

Think !
- If Mahesh is 22 years old, what is the age of Naresh ? _____
- If $y = 8$, what is the age of Mahesh ? _____
- If $y = 13$, how old is Naresh ? _____

Practice 1

1. See the picture and answer the following questions :

(1) If the bat costs ₹ 50 more than the doll, what is the cost of the bat ?

(2) If the water-bag costs ₹ 15 less than the doll, what is the cost of the water-bag ?

(3) If the note-book costs ₹ 20 less than the doll, what is the price of the note- book ?

2. A box contains 35 apples. How many apples are there in m such boxes ?

3. Kinjal and Pinki are sisters. Pinki says to Kinjal, 'You are two years elder to me. If Pinki is 12 years old, what is the age of Kinjal ?'

4. Nayan and Bhargav are friends. Bhargav has twice the number of chocolates than Nayan has. How many chocolates does Bhargav have ? (Use unknown number d for the number of chocolates.)

5. Roshani has 45 beads. She gives some of them to Razia. How many beads would remain with Roshani ? (Use x as unknown number.)

6. If we add ₹ 50 to the rupees Parul has, we get the figure of rupees Ila has. How many rupees does Ila have ? (Use z as unknown number.)

- **Symbolic form :**
- **See and understand :**

Twice of $3 = 2 \times 3$

Thrice of $4 = 3 \times 4$

Four times $10 = 4 \times 10$

Half of $9 = 9 \div 2 = \frac{9}{2}$

One third of $10 = 10 \div 3 = \frac{10}{3}$

One fourth of $6 = 6 \div 4 = \frac{6}{4}$

Twice of $x = 2 \times x = 2x$

Thrice of $y = 3 \times y = 3y$

Six times $b = 6 \times b = 6b$

One fifth of $m = m \div 5 = \frac{m}{5}$

One eighth of $n = n \div 8 = \frac{n}{8}$

- **Now Let us learn to write following in symbolic forms :**

Index	Mathematical description	Symbolic form
1	Adding 4 to x results into 29.	$x + 4 = 29$
2	Adding 5 to thrice of n	$3 \times n + 5 = 3n + 5$
3	Dividing 4 by y	$4 \div y = \frac{4}{y}$
4	Dividing m by 8 and then subtracting 9	$m \div 8 - 9 = \frac{m}{8} - 9$

Example 1 : Adding 15 to ten times a number gives 20. Express this in symbolic form.

Solution : Some number is unknown here. Suppose it is a.

$\therefore$ Adding 15 to 10 times a results into 20.

$\therefore a \times 10 + 15 = 20$

$\therefore 10a + 15 = 20$

Here, $10a + 15 = 20$ is symbolic form of the given mathematical expression.

Example 2 : Kapila says to Jigisha, 'Your age is half of my age.' If the age of Kapila is x, what is the age of Jigisha ? Express symbolically.

Solution : Jigisha's age is half of the age of Kapila.

$\therefore$ Jigisha's age = Kapila's age $\div 2 = x \div 2 = \frac{x}{2}$

$\therefore$ Jigisha's age is $\frac{x}{2}$.

Exercise

1. Express following mathematical expressions in symbolic form :

(1) Adding 10 to x.

(2) If 15 balls are taken out from a heap of balls, then 20 balls remain.

(3) If 16 tomatoes are used to cook a curry of m tomatoes from basket, then 12 tomatoes remain.

(4) Adding 7 to n and then dividing the result by 2.

(5) Adding 4 to thrice of p.

(6) We get 4 subtracting a from 5.

(7) Subtracting one tenth of some number from 25.

(8) Subtracting 7 from b and multiplying the result by 5.

(9) Rahim has got d marbles. If his brother gives him 9 marbles, Rahim will have 27 marbles.

(10) Subtracting 10 from four times z, the result is 10.

(11) Length of a rectangle is 3 times its breadth. What is its length then ? (Use y for unknown.)

(12) Length of a rectangular parallelopiped is twice its breadth. Its height is 4 more than one third of its length. If the breadth is y meters, then find its length and height.

Think : How many people are there in this hall ?

2. Answer the following questions considering the age of Ram as y years :

(1) What will be the age of Ram after five years from now ?

(2) What would be the age of Ram before three years ?

(3) If his grandfather's age is six times his age, then what is the age of his grandfather ?

(4) If his grandmother's age is two years less than his grandfather's age, what is the age of his grandmother ?

(5) His father's age is 5 years more than thrice of his age, what is father's age ?

✦

Practice 1

1. (1) price of the bat = price of the doll + ₹ 50

(2) price of the water-bag = price of the doll – ₹ 15

(3) price of the note-book = price of the doll – ₹ 20

2. Number of apples = $35\ m$ **3.** Age of Kinjal = 14 years **4.** $2d$

5. $45 - x$ **6.** $z + 50$

Exercise

1. (1) $x + 10$ (2) $x - 15 = 20$ (3) $m - 16 = 12$ (4) $\frac{n+7}{2}$ (5) $3p + 4$

(6) $5 - a = 4$ (7) $25 - \frac{x}{10}$ (8) $5\ (b - 7)$ (9) $d + 9 = 27$

(10) $4z - 10 = 10$ (11) $3y$ (12) length = $2y$, breadth = $\frac{2y}{3} + 4$

2. (1) $y + 5$ (2) $y - 3$ (3) $6y$ (4) $6y - 2$ (5) $3y + 5$

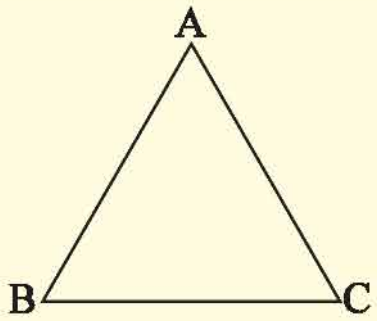
✦

14 Triangle

☞ **Let us remember...**

- Measure the sides of the triangle given below and identify the types of the triangle from that :

(1)



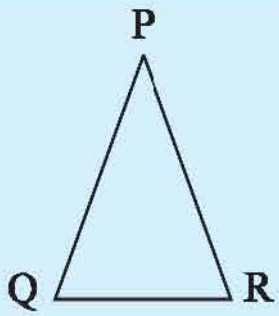
AB = ... *cm*

BC = ... *cm*

CA = ... *cm*

Thus, a triangle with its three sides of equal length is called an equilateral triangle.

(2)



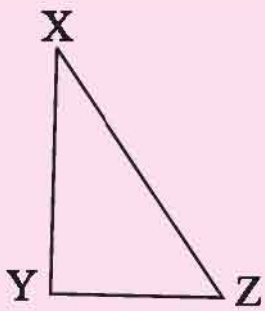
PQ = ... *cm*

PR = ... *cm*

QR = ... *cm*

Thus, a triangle with two sides of equal length is called an isosceles triangle.

(3)



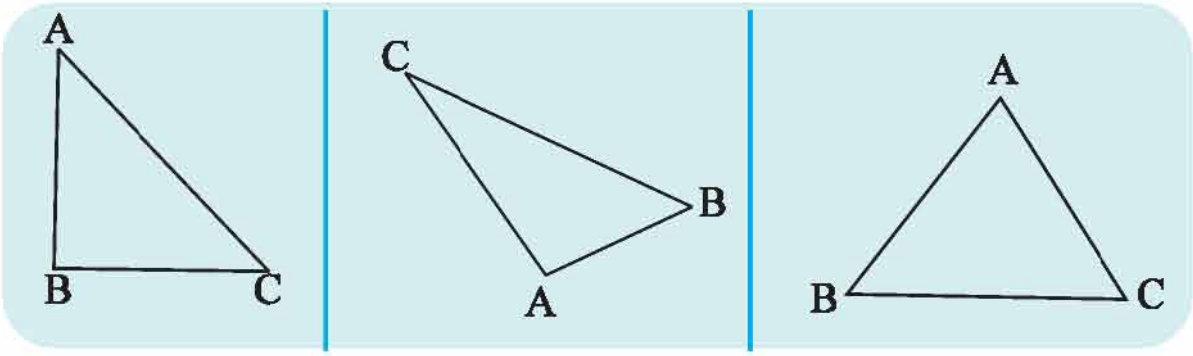
XY = ... *cm*

YZ = ... *cm*

ZX = ... *cm*

Thus, a triangle having all sides of different length is called a scalene triangle or a triangle, in which no two sides are of equal length is called a scalene triangle.

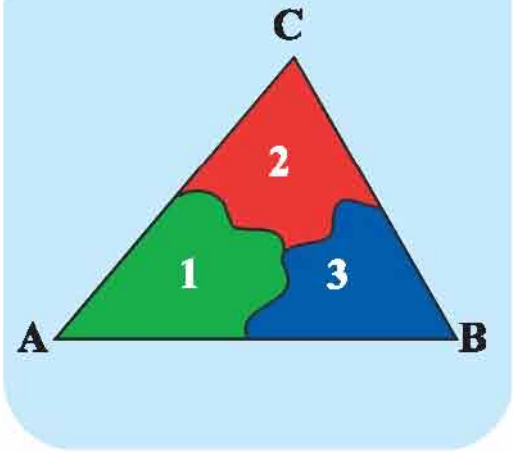
1. Measure the angles of triangles given below and write them in the table :



Δ ABC	Measure∠A	Measure∠B	Measure∠C	Measure∠A + Measure∠B + Measure∠C
1				
2				
3				

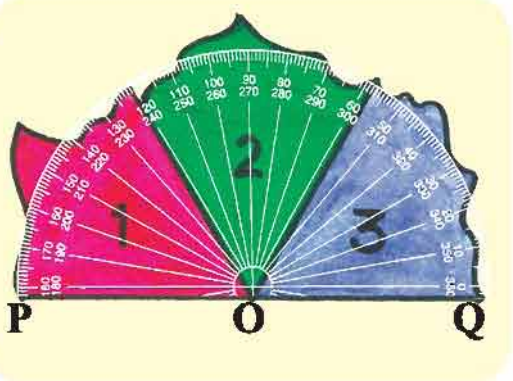
Activity :

First of all, cut a triangle from a paper. Fill in colours in the three angles of the triangle as shown in the figure. Now cut the three angles of the coloured triangle using scissors.



Arrange those three angles as shown in the figure.

Thus, the sum of the three angles of the triangle is 180°.



- Some puzzels based on measure of angles of a triangle :

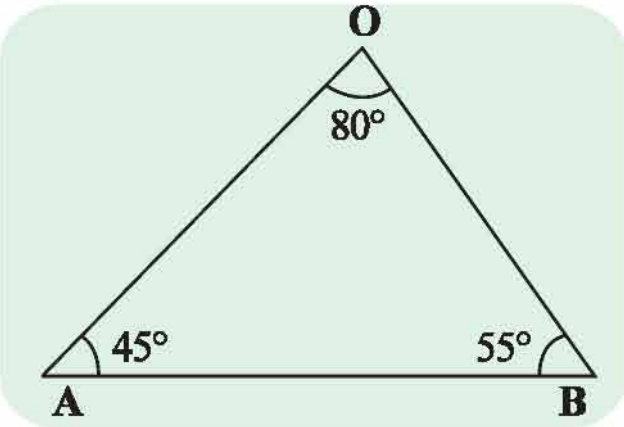
Example 1 : Measure the angles of given Δ AOB using a protractor and add the measures.

Solution : measure ∠A = 45°, measure ∠O = 80°, measure ∠B = 55°.

∴ measure ∠A + measure ∠O + measure ∠B

= 45° + 80° + 55°

= 180°



Example 2 : The measure of one angle of a triangle is 70° and the measure of another angle is 40°. Find the measure of the third angle.

Solution : The measure of two angles of a triangle are 70° and 40°.

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

The measure of two angles of a triangle is given. The sum of these measure

= 70° + 40°

= 110°

∴ The measure of the third angle = 180° – 110° = 70°

Example 3 : In Δ ABC, measure ∠A = 65°, measure ∠B = 55°. Find measure ∠C.

Solution : In Δ ABC measure ∠A = 65°, measure ∠B = 55°

∴ sum of the measure of ∠A and ∠B = 65° + 55°

= 120°

The sum of the measures of all the three angles of a triangle is 180°.

∴ measure ∠C = 180° – 120° = 60°

Example 4 : The measure of one angle of a triangle is 90°. The measure of remaining two angles are equal. Find the measure of those angles.

Solution : Measure of an angle of the triangle is 90°

Measure of the remaining angles are equal.

Sum of the measure of the angles having equal measure = 180° – 90°

= 90°

∴ Sum of the measure of angles having same measure is 90°.

∴ the measure of the angle = $\frac{90}{2}$ = 45°,

∴ Both the angles with equal measure has measure 45°.

Practice 1

1. Find measure of angles of given triangle using protractor and fill in the blanks :

(1) measure ∠A = ...

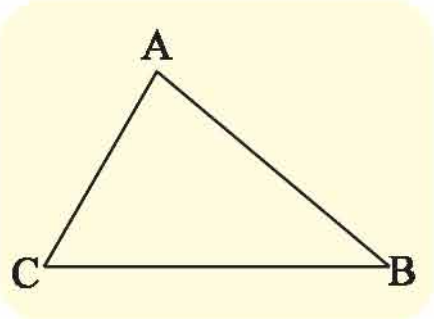
measure ∠B = ...

measure ∠C = ...

measure ∠A + measure ∠B + measure ∠C

= ..... + ... + ...

= .....



(2) measure ∠P = ...

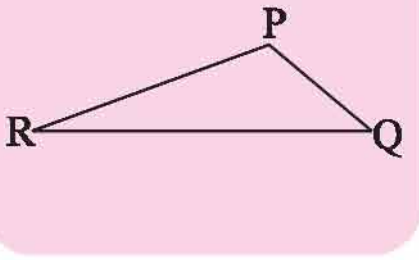
measure ∠Q = ...

measure ∠R = ...

measure ∠P + measure ∠Q + measure ∠R

= ..... + ... + ...

= .....



(3) measure $\angle X$ = ...

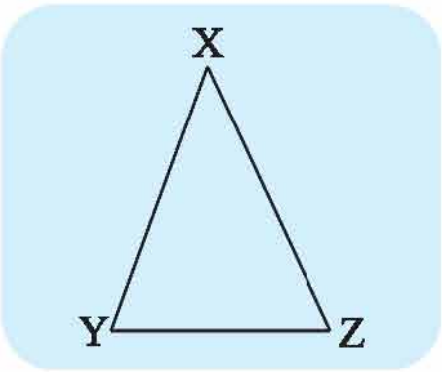
measure $\angle Y$ = ...

measure $\angle Z$ = ...

measure $\angle X$ + measure $\angle Y$ + measure $\angle Z$

= ..... + ... + ...

= .....



2. The measure of two angles of a triangle are 62° and 58°. Find the measure of the third angle.
3. Two angles of a triangle have equal measure, each being 40°, find the measure of the third angle.
4. In a right angled triangle measure $\angle A = 35°$. Find the measure of the other angle which is not right angle.
5. Measures of all the three angles of a triangle are same. Find the measure of each of them.

Exercise

1. **The measure of two angles of a triangle are given below. Write the measure of the third angle and fill in the blanks choosing the correct option.**

(1) 62°, 88°, ... (62°, 35°, 30°)

(2) 77°, 48°, ... (45°, 55°, 65°)

(3) 90°, 30°, ... (06°, 36°, 60°)

(4) 60°, 60°, ... (60°, 90°, 120°)

(5) 12°, 32°, ... (163°, 136°, 44°)

2. The measure of two angles of a triangle are 110° and 65°. Find the measure of the third angle.
3. The measure of two angles of a triangle are equal. If the measure of each equal angle is 45°, find the measure of the third angle.

4. The measure of two angles of a triangle are equal. The measure of the third angle 120°. Find the measure of two equal angles.

5. In Δ ABC, measure $\angle A = 35°$, measure $\angle B = 65°$, find measure $\angle C$.

Practice 1

2. 60° **3.** 100° **4.** 55° **5.** 60°

Exercise

1. (1) 30° (2) 55° (3) 60° (4) 60° (5) 136°

2. 5° **3.** 90° **4.** 30° **5.** 80°

15 Construction of Angles

☞ **Let us recall :**

Activity :

First of all, take a square piece of paper as shown in figure 1 (a). Fold it into half as shown in figure 1 (b). Fold it again as shown in figure 1 (c). Now, unfold it as shown in figure 1 (d) and fold it from a corner as shown in figure 1 (e). Make fold-marks and unfold the paper. Name the angles as shown in the figure.

Now, the fold-marks are clearly visible and you can see all the types of angles on the paper.

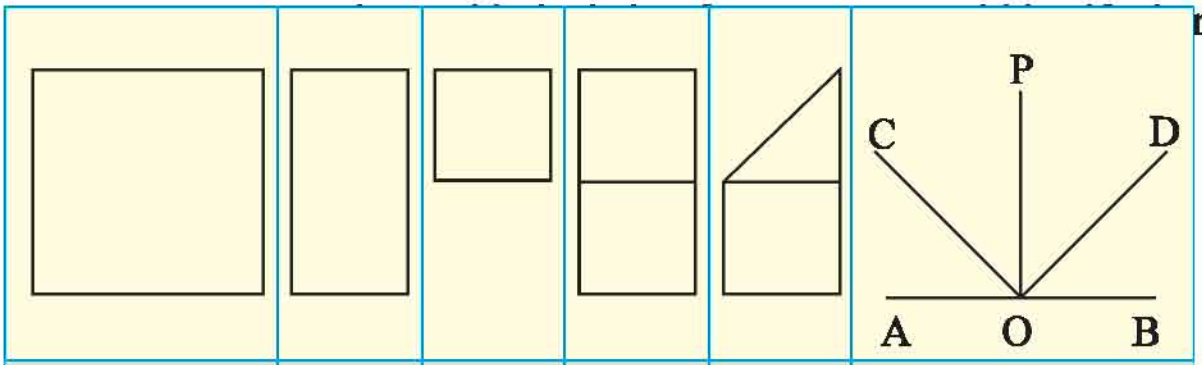


Figure 1(a)	Figure 1(b)	Figure 1(c)	Figure 1(d)	Figure 1(e)	Figure 1(f)

Answer the following questions based on figure 1 (f).

- How many angles are formed in the figure ? Which are they ?
- What is the measure of the acute angle ?
- How many right angles are there ? Which are they ?

- How many obtuse angles are there ? Write their measure.

Various angles are shown in the given pictures. Answer the following questions accordingly :

- In which pictures are the acute angles shown ?
- In which pictures are the obtuse angles shown ?
- In which pictures are the right angles shown ?

Objects shown in above figure point out various angles. Likewise, which types of other such objects around you point out various angles ? Write them in the following table.

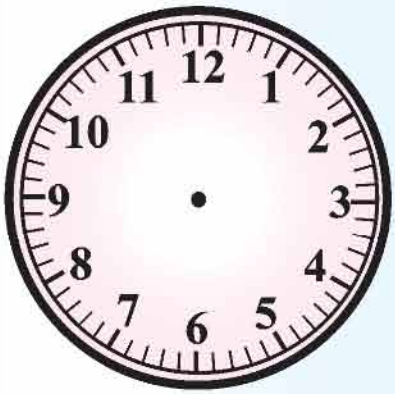
Name of object	Type of angle ?

Study the angles made by the hands of a wall-clock in the given diagram.

Here, the hour hand and the minute hand form few different angles. Measure them using a protractor and decide their type.

		
measure ..... type	measure ..... type	measure ..... type .....

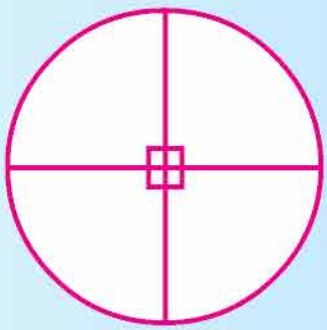
- **Let us learn something new :**



Look at the circle carefully. It has four right angles.

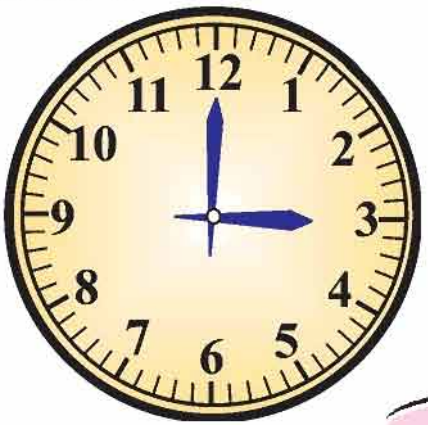
$4 \times 90 = 360°$

Thus, the sum of the measure of all angles made at the centre of a circle is 360°.



Consider the dial of wall-clock as a circle and divide it into 12 equal parts. Each part will subtend an angle of measure $= \frac{360°}{12} = 30°$ at the centre.

Hands of the wall-clock make an angle of 30° when they are at 1 and 2 or 2 and 3.



Look at the wall-clock.

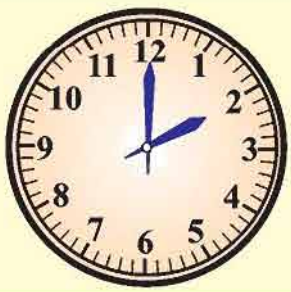
Hour-hand is at 3 and minute-hand is at 12. Three angles each of measure 30° are formed between these two hands.

$30° \times 3 = 90°$

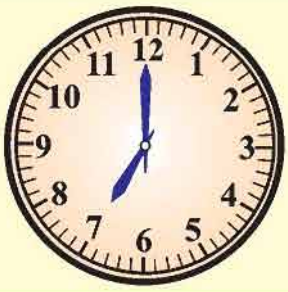
Practice 1

1. What is the measure of the angle formed by two hands in the following wall-clocks ? Write in the box below the wall-clock.

(1)



(2)



(3)

(4)

2. Which type of angle is formed at the time shown below ?
(acute, right, obtuse)

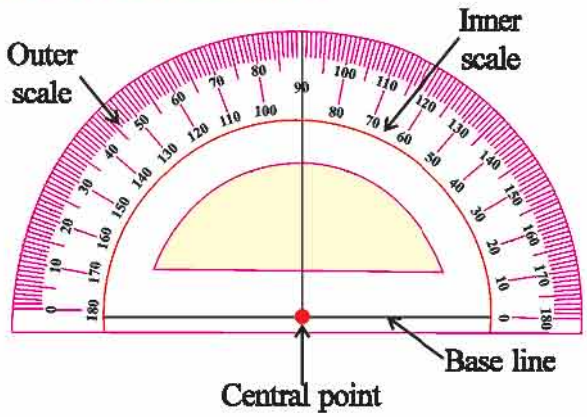
(a) 3 : 20 = ...

(b) 10 : 55 = ...

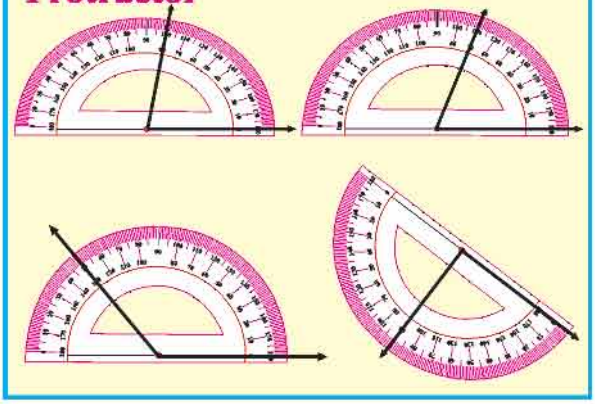
(c) 11 : 25 = ...

(d) 3 : 00 = ...

Use of Protractor :

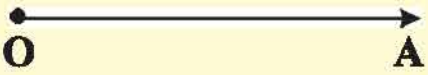
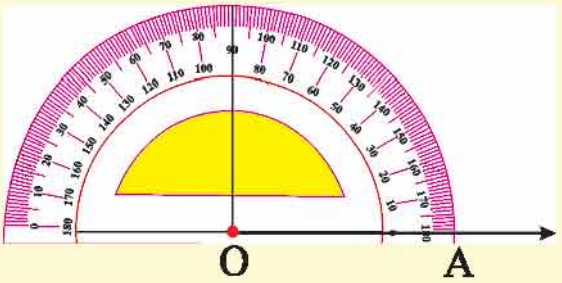
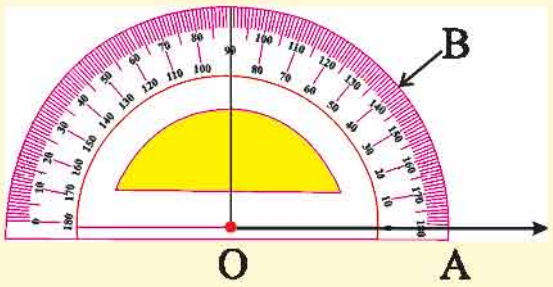


Measuring an angle using the Protractor

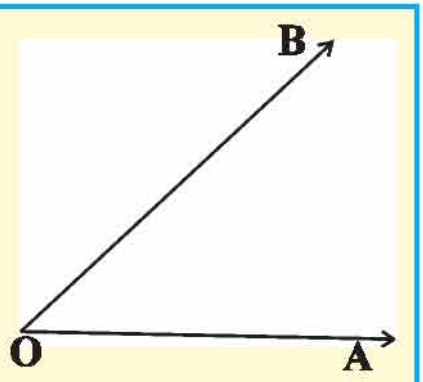


Formation of an angle using a protractor :

Example : Form an angle having measure 40°.

Step 1 : Draw $\overrightarrow{OA}$.	
Step 2 : Place the protractor on $\overrightarrow{OA}$ in such a way that the intial point of $\overrightarrow{OA}$ comes at the central point of the protractor.	
Step 3 : Arrange the base line of the protractor on $\overrightarrow{OA}$.	
Step 4 : On the right hand side of the protractor; starting from 0°, mark B where you read 40°. Then take away the protractor.	

Step 5 :
Construct $\overrightarrow{OB}$.
Thus, $\angle AOB$ is an angle of measure 40°.



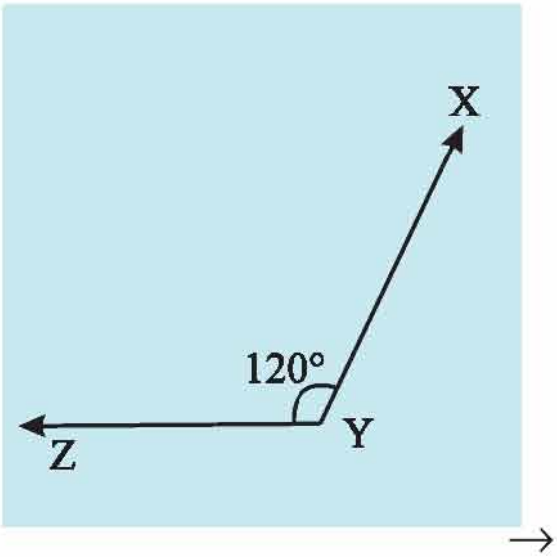
Example 1 : Form an $\angle XYZ$ of measure 120°.

Step 1 : Draw $\overrightarrow{YZ}$.

Step 2 : Place the protractor on $\overrightarrow{YZ}$ in such a way that the inital point Y of $\overrightarrow{YZ}$ falls at the central point of the protractor.

Step 3 : Put the base line of the protractor exactly on $\overrightarrow{YZ}$.

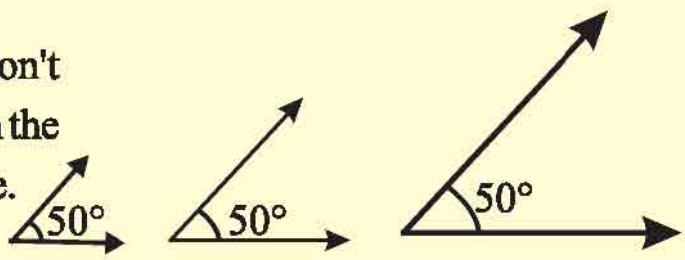
Step 4 : On the left hand side of the protractor, starting from 0°, mark X above $\overrightarrow{YZ}$ where you read 120°.



Step 5 : Construct $\overrightarrow{YX}$. Thus, $\angle XYZ$ is an angle of measure 120°.

Remember :

Length of arms don't make any change in the measure of an angle.



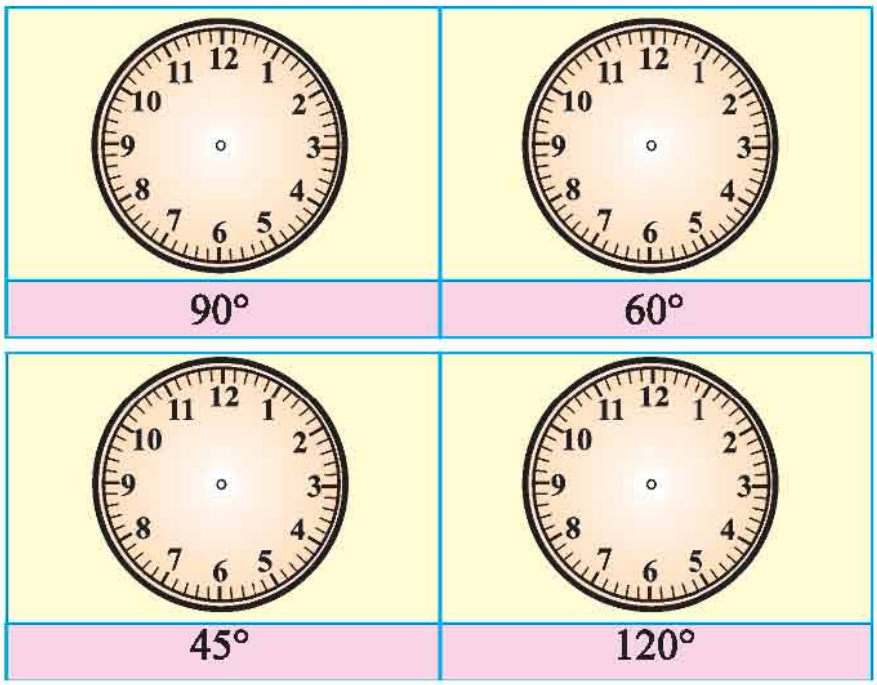
Practice Exercise 2

1. Construct angles having following measures using a protractor :

(1) measure ∠PQR= 145°
(2) measure ∠XYZ = 60°
(3) measure ∠ABC = 20°
(4) measure ∠MNO = 90°
(5) measure ∠O = 35°
(6) measure ∠ I = 170°

Exercise

1. The measure of angles are given below each wall-clock. Construct an angle of the given measure in the clock.



90° | 60°
45° | 120°

2. Construct the angle of the given measure using a protractor :

(a) measure ∠ABC = 155° (b) measure ∠ P = 80° (c) measure ∠ Z = 105°

Remember : We can also write measure ∠PQR = 120° as *m*∠PQR = 120°

Practice 1

1. (1) 60° (2) 150° (3) 30° (4) 120°
2. (a) acute angle (b) acute angle (c) obtuse angle (d) right angle

Revision : 4

1. Calculate using calculator :

(1) 584 × 18 (2) 720 × 20 (3) 912 × 232

(4) 524 ÷ 4 (5) 630 ÷ 6

2. Find average :

(1) 36, 40, 46, 50 (2) 1326, 5940, 2430, 1100, 1029

(3) 328, 244, 523, 192, 483

3. Draw a circle with diameter having measure of 7 *cm* by using compass.

4. Solve the following :

(1) A watch was purchased for ₹ 167 and sold for ₹ 180. What is the profit or loss in this deal ?

(2) Ten compass boxes were purchased for ₹ 256 and sold for ₹ 300. How much profit was made ?

(3) An old washing machine was purchased for ₹ 7000 and it was repaired for ₹ 1150. If it is sold for ₹ 7500, how much profit or loss is there in this deal ?

5. Solve the following :

(1) Measure of two angles of a triangle are 100° and 20°. Find the measure of the third angle.

(2) In Δ XYZ, $m\angle X = 55°$, $m\angle Y = 55°$, find $m\angle Z$.

(3) In Δ PQR, $m\angle P = 35°$, $m\angle Q = 55°$, find $m\angle R$.

6. Calculate and write the proper fraction in the box :

$\frac{19}{31}$	+		=	$\frac{26}{31}$	−		=	$\frac{17}{31}$
+		−		+		−		+
$\frac{4}{31}$	−		=		+	$\frac{2}{31}$	=	
=		=		=		=		=
	+		=	$\frac{27}{31}$	−		=	
−		−		−		−		−
	+		=		−	$\frac{4}{31}$	=	
=		=		=		=		=
$\frac{18}{31}$	+		=		−	$\frac{3}{31}$	=	$\frac{17}{31}$

7. Construct the angles having the following measure :

(1) 135° (2) 85° (3) 30°

8. Mark '✓' the correct option :

(1) The symbolic form of adding 3 to 4 times a is

(a) $3a + 4$ (b) $4a + 3$ (c) $a + 7$ (d) $\frac{a}{4} + 3$

(2) The symbolic form of subtracting 5 from x and then making it double is

(a) $x - 10$ (b) $2x - 5$ (c) $2(x - 5)$ (d) $\frac{x}{2} - 10$

(3) We get 4 by subtracting y from 9, the symbolic form is

(a) $9 - y = 4$ (b) $4 - y = 9$ (c) $y - 4 = 9$ (d) $y - 9 = 4$

(4) Megha is x years old at present. Adding 7 to her age, we get Daksha's age. Daksha's age is _____.

(a) $\frac{x}{7}$ (b) $7x$ (c) $x + 7$ (d) $x - 7$

(5) The symbolic form of 'dividing Mustaq's x marbles into 4 equal parts'

(a) $\frac{4}{x}$ (b) $\frac{x}{4}$ (c) $x + 4$ (d) $4x$

(6) Jignesh says to Asharaf, 'I have got 10 more pens than you have.' If Jignesh has b pens, how many pens does Asharaf have ?

(a) $b - 10$ (b) $10b$ (c) $\frac{b}{10}$ (d) $b + 10$

(7) The symbolic form of 'we get a quotient 5 by dividing a number by 11' is

(a) $11x + 5$ (b) $x + 11 = 5$ (c) $\frac{x}{11} = 5$ (d) $\frac{11}{x} = 5$

1. (1) 10,512 (2) 14,400 (3) 2,11,584 (4) 131 (5) 105

2. (1) 43 (2) 2365 (3) 354

4. (1) profit ₹ 13 (2) profit ₹ 44 (3) loss ₹ 650

5. (1) 60° (2) 70° (3) 90°

8. (1) b (2) c (3) a (4) c (5) b (6) a (7) c