Mathematics
Standard Four
Pupil's Book

Tanzania Institute of Education

Mathematics
Standard Four

Pupil's Book

THE UNITED REPUBLIC OF TANZANIA
MINISTRY OF EDUCATION,
SCIENCE AND TECHNOLOGY

Certificate of Approval

No. 278

Tittle of Publication: Mathematics Standard Four Pupil's Book

Publisher: Tanzania Institute of Education

Author: Tanzania Institute of Education

ISBN: 978-9987-09-117-1

This book was approved by the Ministry of Education, Science and Technology on 5th month of December year 2019 as a Textbook for Standard Four in Primary Schools in Tanzania as per 2016 Syllabus.

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Tanzania Institute of Education

Published 2019
Reprinted 2021

ISBN 978–9987–09–117–1

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Acknowledgements

Tanzania Institute of Education (TIE) would like to acknowledge the contributions of all organizations and individuals who participated in design and development of this textbook.

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TIE also extends its sincere gratitude to the primary school teachers and pupils who participated in the trial phase of the manuscript.

Likewise, the Institute would like to thank the Ministry of Education, Science and Technology for facilitating the writing of this textbook.

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Introduction

This is the second book in a series of five books for Mathematics for primary schools. The book is prepared according to the 2016 Mathematics syllabus for primary schools issued by The Ministry of Education, Science and Technology. The book consists of thirteen chapters which are: Whole numbers, Roman numbers, Number patterns, Addition of numbers, Subtraction of numbers, Multiplication of numbers, Division of numbers, Fractions, Time, Tanzanian Currency, Metric units, Geometry and Statistics. Some chapters contain activities which enable you to acquire mathematical concepts, knowledge and skills. The activities and exercises will help you to develop competences in mathematical numeracy.

Chapter One

Whole numbers

Introduction

In Standard Three, you learnt counting, reading, writing and identifying the place values of digits in a number. In this chapter, you will continue to learn counting, reading and writing numbers. Also, you will learn further on the place values of digits in a number. This competence will help you to solve real life problems such as counting objects or things in your daily life.

Exercise 1: Revision

1. Fill in the blanks the missing numbers in numerals or words. The first row is done as an example.

Numbers in numeral	Numbers in words
9 999	Nine thousand nine hundred and ninety-nine.
	Five thousand six hundred and fifty-nine.
8 909	
	Four thousand nine hundred and ninety-five.
3 001	
	One thousand and eighty-four.

2. Write a place value of the digit shown in the table. The first row is done as an example.

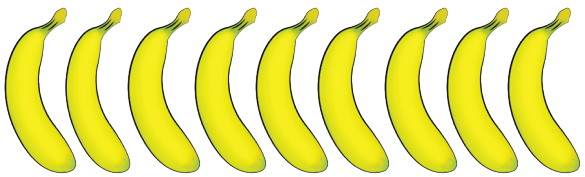
Number	Digit	Place value
3 579	9	Ones
5 489	5	
6 713	1	
7 493	4	

Counting by grouping

Objects can be counted one by one or by grouping. Counting by grouping is simple than counting one by one.

Example 1

Count the following bananas one by one:



Nine

Example 2

(a) Count the following sticks one by one:

Fifteen

(b) Count sticks in Example 2 by grouping.

Steps

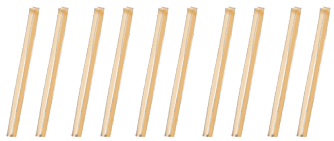
1. Identify the groups in a given number (start with the largest group). Here, the largest group is tens. So the sticks form groups of tens and ones.
2. Group the sticks to form groups of tens. You will get one group of ten sticks.
3. The remaining sticks are in a group of ones. Count them to get five sticks.

4. Count the sticks in each group and then add them from both groups.

   Thus, 10 + 1 + 1 + 1 + 1 + 1 = 15.

5. The first digit on the right of number 15 is called ones while the second digit is called tens.

6. Thus, there is 1 group of tens with 10 sticks. The sticks less than 10 are called ones. Therefore, in a group of 15 sticks, there is 1 tens and 5 ones. The total is fifteen as shown in the following table:

Tens	Ones	Number in words
		**Fifteen**

Example 3

Count 212 pencils by grouping.

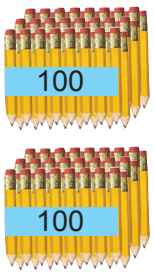
Steps

1. Identify the groups in a given number, (that is ones, tens, …) and start with the largest group. The largest group here is hundreds.
2. Group the pencils in hundreds.
3. Count the groups with one hundred pencils each. You will get 2 groups of hunderds.
4. Count the remaining pencils. You will get twelve pencils.
5. Group the remaining pencils in tens. You will get 1 group of tens.
6. Count the remaining pencils. You will get 2 pencils in a group of ones.
7. Add the pencils in each group and add the pencils from all the groups.

   Thus, (100 + 100) + 10 + (1 + 1) = 200 + 10 + 2 = 212.

8. The first digit from the answer on the right is in the ones position, the second digit from right is in tens position and the third digit from right is in hundreds position.

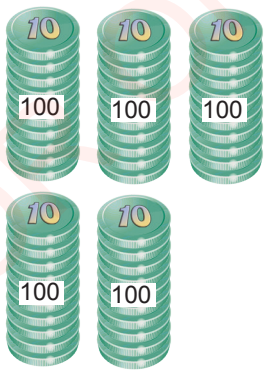
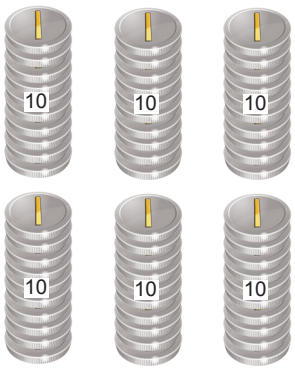
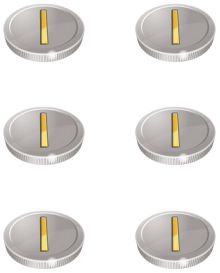
9. Thus, there are 2 groups of hundreds, 1 group of tens and 2 groups of ones. Therefore, the total is two hundred and twelve as shown in the following table:

Hundreds	Tens	Ones	Number in words
			**Two hundred and twelve**

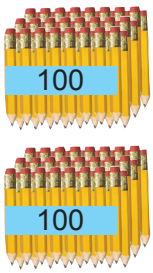
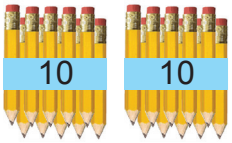
Exercise 2

Count and write in words the number represented by the following coins:

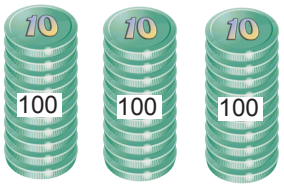
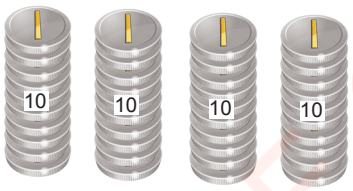
1.

Hundreds	Tens	Ones
		

2.

Hundreds	Tens	Ones
		

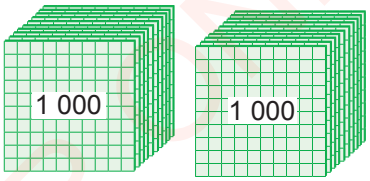
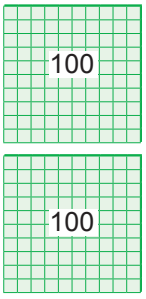
3.

Hundreds	Tens	Ones
		

Counting objects in groups

Example 1

Count and write in words the number represented by the following boxes:

Thousands	Hundreds	Tens	Ones
			

Steps

1. Count the groups with 1 000 boxes each. You will get 2 groups; that is, 1 000 + 1 000.

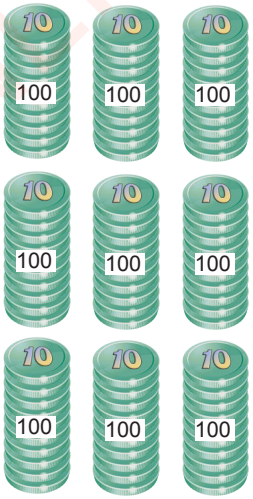
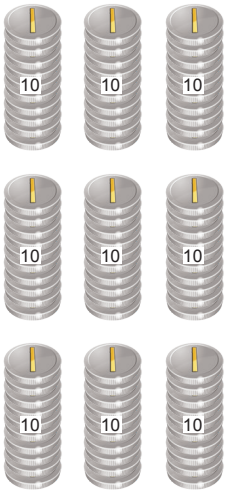
2. Count the groups with 100 boxes each. You will get 2 groups; that is, 100 + 100.
3. Count the groups with 10 boxes each. You will get 1 group with 10 boxes; that is, 10.
4. Count the remaining boxes. You will get 3 boxes in a group of ones; that is, 1 + 1 +1.
5. Add the boxes in all the groups. That is,

   1 000 + 1 000 + 100 + 100 + 10 +1 + 1 + 1 =

   2 000 + 200 + 10 + 3 = 2 213
6. The first digit from right is in the ones position, second digit is in the tens position, third digit is in the hundreds position and fourth digit is in the thousands position.
7. Therefore, there are two groups of thousands, two groups of hundreds, one group of tens and three ones.

Example 2

Count the groups of coins and write the number in words.

Thousands	Hundreds	Tens	Ones
			

Steps

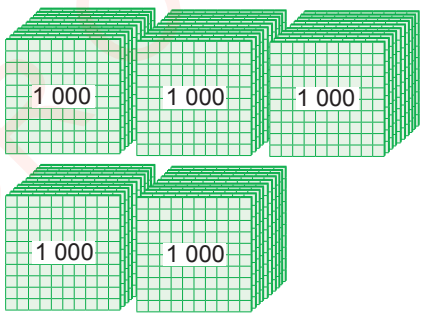
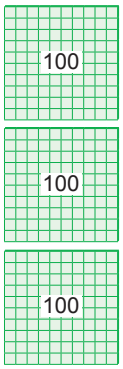
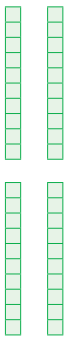
1. Count groups of thousands. You will get 9 groups of 1 000 coins each. That is, 1 000 + 1 000 + 1 000 + 1 000 + 1 000 + 1 000 + 1 000 + 1 000 + 1 000 = 9 000.
2. Count groups of hundreds. You will get 9 groups of 100 coins each. That is, 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 = 900
3. Count groups of tens. You will get 9 groups of 10 coins. That is, 10 + 10 + 10 + 10 + 10 + 10 + 10 + 10 + 10 = 90
4. Count ones. You will get 9 ones.

   That is, 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 = 9
5. Add the coins in all the groups to get, 9 000 + 900 + 90 + 9 = 9 999.
6. The first digit from the right is in the ones position, the second digit is in the tens position, the third digit is in the hundreds position and the fourth digit is in the thousands position.
7. Therefore, 9 999 in words is; nine thousand nine hundred and ninety-nine.

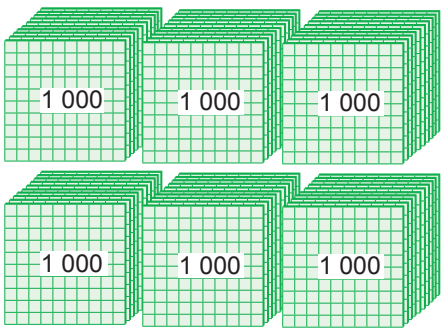
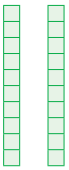
Exercise 3

Count the groups of boxes, pencils and coins then write the numbers in words.

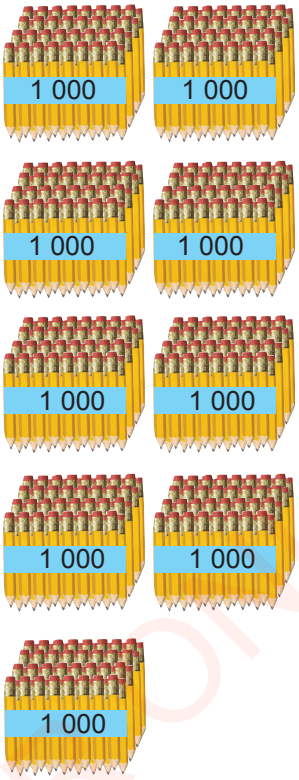
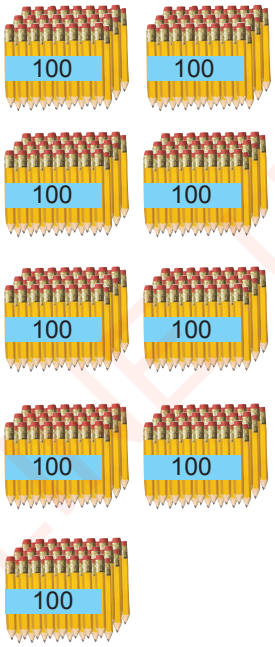
1.

Thousands	Hundreds	Tens	Ones
			

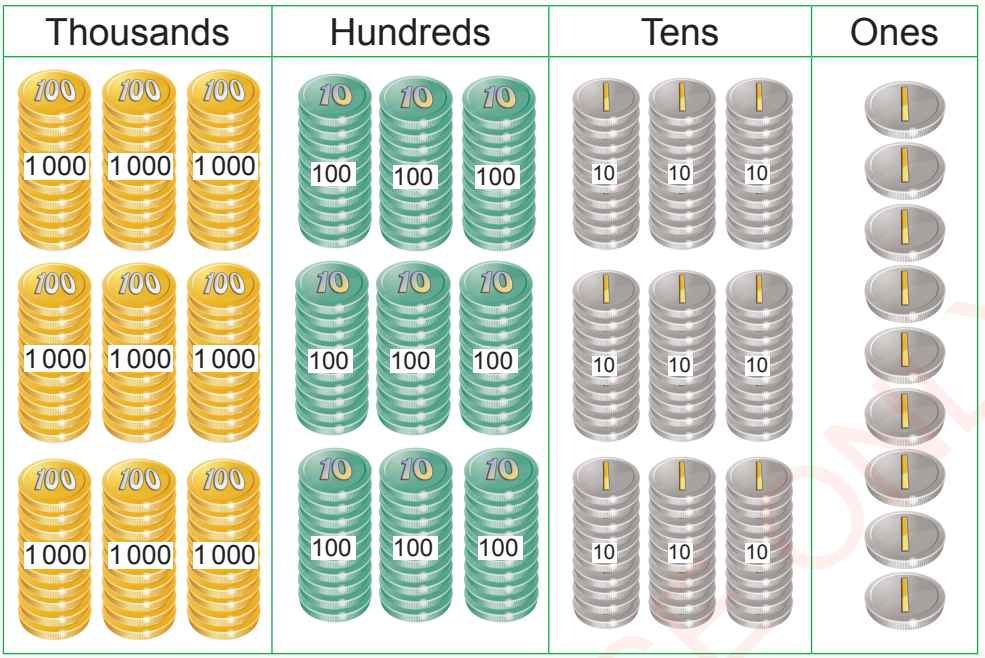
2.

Thousands	Hundreds	Tens	Ones
			

3.

Thousands	Hundreds	Tens	Ones
			

4.



Ten groups which have one thousand objects each form one group of ten thousand.

Example 1

Study the following table and write in numerals and in words:

Ten thousands	Thousands	Hundreds	Tens	Ones
				
1	0	0	0	0

Therefore, 10 000 in words is, ten thousand.

Example 2

Ten thousands	Thousands	Hundreds	Tens	Ones
				
1	0	0	0	1

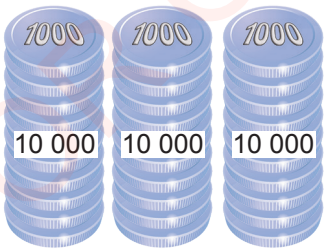
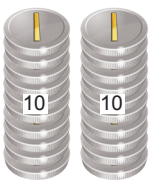
Steps

1. Count the groups in the ten thousands position. You will get 1 group of 10 000. Write 1 in the ten thousands position.
2. There are no coins in the place values of thousands, hundreds and tens. Write 0 in these positions.
3. In ones position, there is 1 coin. Write 1 in the ones position.
4. Add the coins from all the groups. That is,

   10 000 + 0 + 0 + 0 + 1 = 10 001.
5. Therefore, the value of the coins in numeral is 10 001. In words, ten thousand and one.

Example 3

Write the value of the following coins in numerals and in words:

Ten thousands	Thousands	Hundreds	Tens	Ones
				
3	2	1	2	1

Steps

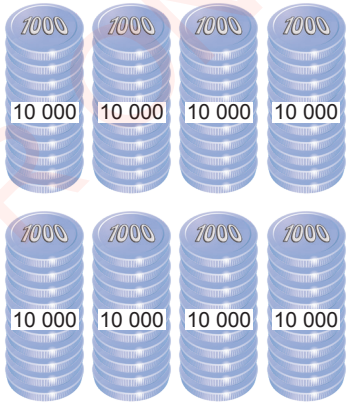
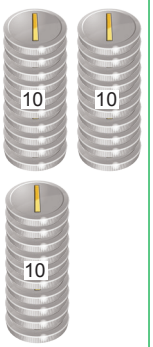
1. Count the groups in the ten thousands position. You will get 3 groups of 10 000 coins. That is, 10 000 + 10 000 + 10 000.
2. Count the groups in the thousands position. You will get 2 groups of 1 000 coins. That is, 1 000 + 1 000.
3. Count the groups in the hundreds position. You will get 1 group of 100 coins. That is, 100.
4. Count the groups in the tens position. You will get 2 groups of 10 coins. That is, 10 + 10.
5. Count the group in the ones position. You will get 1 coin. That is, 1.
6. Add ten thousands, thousands, hundreds, tens and ones to get: (10 000 + 10 000 + 10 000) + (1 000 + 1 000) + 100+ (10 + 10) + 1 = 32 121
   30 000 + 2 000 + 100 + 20 + 1 = 32 121
7. Therefore, the number is 32 121. In words is, thirty-two thousand one hundred and twenty-one.

Exercise 4

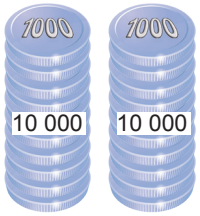
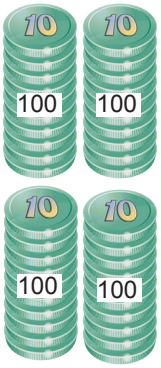
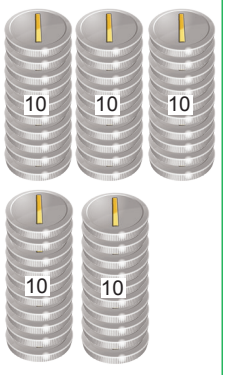
Answer the following questions:

1. Count and write in numerals and in words the number represented by the following coins:

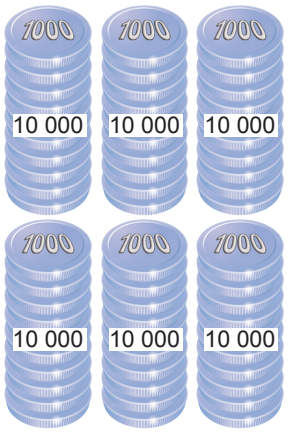
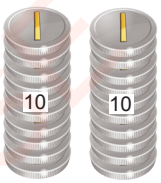
(a)

Ten thousands	Thousands	Hundreds	Tens	Ones
				

(b)

Ten thousands	Thousands	Hundreds	Tens	Ones
				

(c)

Ten thousands	Thousands	Hundreds	Tens	Ones
				

2. Fill in the missing numbers in the following sequences:

(a) 10 000, 20 000, 30 000, 40 000, ____, 60 000, ____, ____, ____

(b) 20 000, 40 000, ____, 80 000

(c) 70 100, 70 200, ____, 70 400, ____

(d) 85 000 | 85 150 | | 85 450 | | 85 750 | |

(e) 4 560 | 4 700 | | 4 980 | | 5 260

(f) 10 500 | 11 000 | | 12 000 | | 13 000

3. Write the number represented by the following abacus:

Ten thousands	Thousands	Hundreds	Tens	Ones
				

Place values of digits in a number

The following table shows the place value of each digit in the number:

Number in numeral	Place values of the digits					Number in words
	Ten thousands	Thousands	Hundreds	Tens	Ones	
19 567	1	9	5	6	7	Nineteen thousand five hundred and sixty-seven
98 879	9	8	8	7	9	Ninety-eight thousand eight hundred and seventy-nine

You can expand the number according to the place values of its digits.

Example 1

(a) Write the place values of all the digits in 29 567.
(b) Write 29 567 in expanded form by considering the place value of each digit.

Answer

(a) 2 is in ten thousands
9 is in thousands
5 is in hundreds
6 is in tens
7 is in ones

(b) The expanded form of 29 567 =
20 000 + 9 000 + 500 + 60 + 7.

Example 2

Write the place value of each digit in 57 269.

Solution

Numbers in numeral	Place values of the digits
5	Ten thousands
7	Thousands
2	Hundreds
6	Tens
9	Ones

Exercise 5

Answer the following questions:

1. Write the place value of digits in each of the following numbers:
   (a) 23 967 (b) 23 679 (c) 67 809
   (d) 76 012 (e) 30 645

2. Write the following numbers in expanded form by considering the place value of each digits:
   (a) 40 788 (b) 39 615 (c) 45 565
   (d) 32 544 (e) 98 735

3. Use the following numbers to fill in the blanks:
   (a) 13 739 = ___ ten thousands ___ thousands ___ hundreds ___ tens ___ ones.
   (b) 61 270 = ___ ten thousands ___ thousands ___ hundreds ___ tens ___ ones.
   (c) 39 901 = ___ ten thousands ___ thousands ___ hundreds ___ tens ___ ones.

(d) 20 897 = ___ ten thousands ___ thousands ___ hundreds ___ tens ___ ones.

(e) 39 001 = ___ ten thousands ___ thousands ___ hundreds ___ tens ___ ones.

(f) 40 461 = ___ ten thousands ___ thousands ___ hundreds ___ tens ___ ones.

(g) 89 345 = ___ ten thousands ___ thousands ___ hundreds ___ tens ___ ones.

(h) 99 678 = ___ ten thousands ___ thousands ___ hundreds ___ tens ___ ones.

4. Which one among the following is the largest number?
22 212, 22 122, 22 221, 22 222, 21 222

5. Which one among the following is the smallest number?
88 214, 88 124, 88 421, 84 812, 84 821

Reading and writing numbers

Example

Read the following numbers:

Numbers in numerals	Numbers in words
10 520	Ten thousand five hundred and twenty
25 559	Twenty-five thousand five hundred and fifty-nine
99 999	Ninety-nine thousand nine hundred and ninety-nine

Exercise 6

Answer the following questions:

1. Read the following numbers:

(a) 9 999, 10 000, 10 001, 10 002, 10 003, 10 004, 10 005, 10 006, 10 007, 10 008, 10 009

(b) 10 010, 10 020, 10 030, 10 040, 10 050, 10 060, 10 070, 10 080, 10 090, 10 100, 10 110

(c) 20 200, 20 400, 20 600, 20 800, 21 000, 21 200, 21 400, 21 600, 21 800, 22 000, 22 200

(d) 10 100, 11 200, 12 300, 13 400, 14 500, 15 600, 16 700, 17 800, 18 900, 20 000

(e) 88 150, 88 250, 88 350, 88 450, 88 550, 88 650, 88 750, 88 850, 88 950

(f) 99 991, 99 992, 99 993, 99 994, 99 995, 99 996, 99 997, 99 998, 99 999

2. Read and write the following numbers in words:

Numbers in numerals	Numbers in words
28 749	
38 951	
76 187	
97 000	
72 008	
98 901	
90 001	

88 888	
57 892	
11 237	
72 657	
40 690	
30 001	
72 020	

Writing numbers in numerals

Example

Numbers in words	Numbers in numerals
Nineteen thousand five hundred and five.	19 505
Eighty-seven thousand seven hundred and seventy-six.	87 776

Exercise 7

Write the following numbers in numerals:

Numbers in words	Numbers in numerals
1. Seventy thousand eight hundred and five.	
2. Ninety-nine thousand eight hundred and eight.	
3. Fifty-three thousand two hundred and ninety-seven.	

4. Thirty-three thousand six hundred and seventy-two.	
5. Forty thousand six hundred and sixty-nine.	
6. Eighty thousand six hundred and seven.	
7. Twenty-one thousand two hundred and five.	
8. Ninety thousand and nine.	
9. Thirty-five thousand six hundred and eleven.	
10. Seventy thousand.	
11. Sixty-nine thousand one hundred and fifty-five.	
12. Twenty-eight thousand nine hundred and seven.	
13. Forty-five thousand seven hundred and ninety-nine.	
14. Ninety thousand nine hundred and eight.	
15. Two thousand and sixty-seven.	
16. Fifteen thousand eight hundred and forty.	
17. Nine thousand seven hundred and fifty-three.	
18. Ninety-nine thousand one hundred and ninety-nine.	

Summary

1. In order to count many objects easily, it is better to put the objects in groups.
2. The groups of objects may be of different sizes.

Chapter Two

Roman numbers

Introduction

Whole numbers are formed by ten digits which are 0, 1, 2, 3, 4, 5, 6, 7, 8 and 9. These numbers are called numerals (or Arabic numbers). Roman numbers are formed using some alphabets like I, V, X, L, C and M. The basic Roman numbers are formed by the alphabets I, V, X and L. In this chapter, you will learn how to read and write Roman numbers from I to L. This is the same as from 1 to 50 in numerals. This knowledge will help you to read time on some clocks and watches, stating classroom standards, identifying preliminary pages in a book and other activities of your daily life.

Roman numbers from I to X

Read the following numbers:

Roman numbers	Numbers in numerals	Numbers in words
I	1	One
II	2	Two
III	3	Three
IV	4	Four
V	5	Five
VI	6	Six
VII	7	Seven
VIII	8	Eight
IX	9	Nine
X	10	Ten

Activity

Study the following list of numbers and answer the questions that follow: 4, II, 5, IV, I, III, 2, V, 3.

1. List down the Roman numbers.
2. Read loudly the Roman numbers you have listed.

Reading and writing Roman numbers from I to X

The Roman number (**I**) can be repeated to form other Roman numbers. For example:

Numbers in numeral	1	2	3
Roman numbers	I	II	III

The Roman number (**I**) can not be repeated more than three times. Also, Roman numbers I, V and X are used to form other Roman numbers. For example:

IV	V	VI	VII	VIII	IX
5 – 1 = 4	5	5+1 = 6	5+2 = 7	5+3 = 8	10 – 1= 9

When a smaller Roman number is written on the right of a larger Roman number, the resulting Roman number is read by adding their values in numerals.

Example 1

(a) II = 1 + 1, is equal to 2
(b) VI = 5 + 1, is equal to 6
(c) VII = 5 + 2, is equal to 7

When a smaller Roman number is written on the left of another larger Roman number, the resulting Roman number is read by subtracting their values in numerals.

Example 2

(a) IV = 5 – 1, is equal to 4

(b) IX = 10 – 1, is equal to 9

Exercise 1

Answer the following questions:

1. Arrange the following numbers from the smallest to the largest: IX, VI, X, IV, VII, V, VIII
2. Write the following Roman numbers in numerals:
   VII, IV, VI, V, VIII, IX
3. Write the following numerals in Roman numbers:
   3, 6, 7, 1, 8, 4, 10, 9, 5
4. Fill in the missing Roman numbers in the following table:

Numbers in words	Six	Seven	Nine	Four	Ten
Roman numbers		VII		IV	

Roman numbers from XI to XX

Example 1

Read the following numbers:

Roman numbers	Numbers in numerals	Number in words
XI	11	Eleven
XII	12	Twelve

XIII	13	Thirteen
XIV	14	Fourteen
XV	15	Fifteen
XVI	16	Sixteen
XVII	17	Seventeen
XVIII	18	Eighteen
XIX	19	Nineteen
XX	20	Twenty

Example 2

Write the numbers 11, 12, 14, 15, 17 and 19 in Roman:

11	12	14	15	17	19
XI	XII	XIV	XV	XVII	XIX

Exersice 2

Answer the following questions:

1. What is the largest number among the following Roman numbers?
   XI, XII, XIII, XV, XVI, XVII, XVIII, XIV, XIX

2. Read and write the following Roman numbers in words:
   (a) XIV (b) XVI (c) XX
   (d) XI (e) XV (f) XIX

3. Write the following numbers in Roman:

Numbers in numerals	19	17	13	16	20	14	12	18	11	15
Roman numbers										

4. Write the following Roman numbers in numerals:

Roman number	XI	XVIII	XV	XVII	XIV	XII
Numbers in numerals						

5. Write the missing numbers in each of the following pattern:

(a) X, ____, XIV, XVI, ____, XX

(b) ____, XIV, ____, XII, ____, X

Roman numbers from XXI to XXXIII

Example 1

Read the following numbers:

Roman numbers	Numbers in numerals	Numbers in words
XXI	21	Twenty-one
XXII	22	Twenty-two
XXIII	23	Twenty-three
XXIV	24	Twenty-four
XXV	25	Twenty-five
XXVI	26	Twenty-six
XXVII	27	Twenty-seven
XXVIII	28	Twenty-eight
XXIX	29	Twenty-nine
XXX	30	Thirty
XXXI	31	Thirty-one
XXXII	32	Thirty-two
XXXIII	33	Thirty-three

Example 2

Write 24, 30 and 27 in Roman numbers.

(a) 24 = 10 + 10 + (5 – 1 = 4) = XXIV

(b) 30 = 10 + 10 + 10 = XXX

(c) 27 = 10 + 10 + 5 + 2 = XXVIII

Exercise 3

Answer the following questions:

1. Write the following numbers in Roman:

(a) 29 (b) 26 (c) 32 (d) 23

2. Write the following Roman numbers in numerals:

(a) XXII (b) XXXI (c) XXVIII (d) XXV

3. In each of the following pattern, write the missing Roman numbers:

(a) XXI, ____, XXIII, ____, ____, XXVI

(b) XXIV, ____, XXVI, ___, ___, XXIX, ___, ___, ___

(c) XXXII, ___, XXX, ___, XXVIII, ___, XXVI

(d) ___, ___, XXV, ___, XXIII, XXII, ___

Roman numbers from XXXIV to L

Example 1

Read the following numbers:

Roman numbers	Numbers in numerals	Numbers in words
XXXIV	34	Thirty-four
XXXV	35	Thirty-five
XXXVI	36	Thirty-six
XXXVII	37	Thirty-seven
XXXVIII	38	Thirty-eight
XXXIX	39	Thirty-nine
XL	40	Forty
XLI	41	Forty-one
XLII	42	Forty-two
XLIII	43	Forty-three
XLIV	44	Forty-four
XLV	45	Forty-five
XLVI	46	Forty-six
XLVII	47	Forty-seven
XLVIII	48	Forty-eight
XLIX	49	Forty-nine
L	50	Fifty

Example 2

Write 35 and 39 in Roman.

(a) 35 = 10 + 10 + 10 + 5, this is equal to XXXV.

(b) 39 = 10 + 10 + 10 + (10 –1 = 9), this is equal to XXXIX.

Example 3

Write 40 in Roman:

40 = 50 – 10, this is equal to XL.

Exercise 4

Answer the following questions:

1. Write the following numbers in Roman:
   (a) 44 (b) 39 (c) 35 (d) 46 (e) 41
2. Write the following Roman numbers in numerals:
   (a) L (b) XXXVI (c) XLVIII (d) XLI
   (e) XXXIV
3. Fill in the blanks using Roman numbers in the following pattern:
   (a) XXXIV, ___, XXXVI, ___, ___, XXXIX
   (b) XXXVI, XXXVIII, ___, XLII, XLIV, ___, ___, ___
   (c) L, ___, XLIV, ___, XXXVIII, XXXV

Exercise 5

1. Fill in the blanks in the following table:

Numbers in numerals		17		46
Roman numbers	XXXII		VIII	

2. Fill in the blanks of the following questions using Roman numbers:
   (a) XIX, XXI, XXIII, XXV, ____, ____, ____
   (b) X, ____, XX, XXV, ____, ____, XL, ____, L

(c) L, XL, _____, XX, X

(d) VII, VI, V, _____, III, _____, I

3. Use two sticks to show how 10 can be formed as a Roman number and write it in your exercise book.
4. Nuru saw a poster written XLIV. What is this number?
5. Write the following numbers in words:

   (a) XLIX (b) XXIII (c) XXV (d) XXXVII
6. Write the following numbers in Roman:

   (a) Forty-two

   (b) Twenty-nine

   (c) Thirty-nine

   (d) Thirteen

Summary

1. Numerals are formed by ten digits which are 0, 1, 2, 3, 4, 5, 6, 7, 8 and 9.
2. The basic Roman numbers are I, V, X and L. These numbers are used to form other Roman numbers from I to L.
3. In writting Roman numbers, the same number cannot be repeated in succession more than three times.

Chapter Three

Number patterns

Introduction

In Standard Three, you learnt patterns of objects and numbers. In this chapter, you will continue to learn patterns of various objects and numbers. This knowledge will enable you to do different activities in your daily life such as arrangement of objects or things in a specific order.

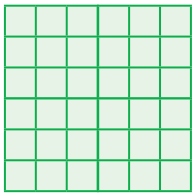
Exercise 1: Revision

1. List down four objects that show artificial patterns.
2. List down three animals having colour patterns.
3. Study the following figures. List down letters for figures containing natural patterns.

(a)

(b)

1 8



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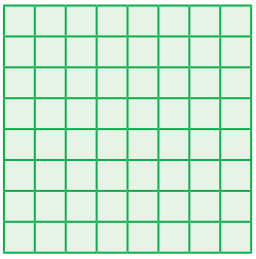

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(c)

(d)

4. Arrange the following numbers from the smallest to the largest: 56, 36, 76, 86, 16, 26, 66, 46

5. Fill in the missing numbers in the following patterns.

   (a) 55, 50, 45, ___, ___, 30, ___, ___, ___, 10

   (b) 9 399, 9 499, 9 599, ___, ___, ___, 9 999

   (c) 8 850, 7 750, 6 650, ___, 4 450, ___, ___

   (d) 10, 7, 4, 1; 10 ___, 4, ___; ___ 7, 4, ___

Number patterns

Number patterns can be in an increasing (ascending), decreasing (descending) or repeating order.

Study the following number patterns:

1. An ascending number pattern that increases by 1 000.

   1 000, 2 000, 3 000, 4 000, 5 000, 6 000, 7 000, 8 000,

   9 000, 10 000, 11 000, 12 000, 13 000, 14 000, 15 000

2. A descending number pattern that decreases by 50.

   750, 700, 650, 600, 550, 500, 450, 400,

   350, 300, 250, 200, 150, 100, 50, 0

3. The three repeating number pattern.

   1 000, 2 000, 3 000; 1 000, 2 000, 3 000; 1 000, 2 000, 3 000

Number patterns formed by addition

Example 1

Find the missing numbers in the following pattern:

1, 4, 7, 10, 13, 16, 19, __, __

The next number is obtained by adding 3 to the previous number.

1 + 3 = 4

4 + 3 = 7

7 + 3 = 10

10 + 3 = 13

13 + 3 = 16

16 + 3 = 19

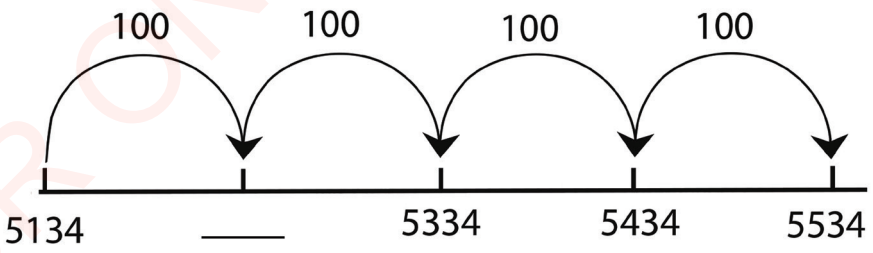
19 + 3 = 22

22 + 3 = 25

Therefore, the missing numbers are 22, 25

Example 2

Find the missing number in the following pattern:



5 134 + 100 = 5 234

Therefore, the missing number is 5 234.

Example 3

Find the missing numbers in the following pattern:

1, 3, 5, 7, 9, __, __

The next number is obtained by adding 2 to the previous number.

1 + 2 = 3
3 + 2 = 5
5 + 2 = 7
7 + 2 = 9
9 + 2 = 11
11 + 2 = 13

Therefore, the missing numbers are 11, 13

Exercise 2

Write the missing numbers in the following patterns:

1. 0, 2, 4, 6, ___, ____, ___
2. 11, 22, 33, 44, ___, ____, ___
3. 2, 6, 10, 14, 18, ___, ____, ___
4. 3, 8, 13, 18, 23, 28, 33, ___, ____, ___
5. 4, 10, ____, 22, ____, 34, 40, 46, ____, 58
6. 210, 220, 230, 240, 250, 260, ___, ____, ___
7. 415, 418, ____, 424, ____, 430, 433, ___
8. 1 011, 1 014, ____, 1 020, 1 023, ____, 1 029, ___
9. 2 342, 2 350, 2 358, ____, ___, 2 382, 2 390, 2 398, ___
10. 45 552, 46 552, ____, ____, 49 552, 50 552, ____, 52 552

Number patterns formed by subtraction

Example 1

Find the missing numbers in the following pattern:
25, 23, 21, __, __

The next number is obtained by subtracting 2 from the previous number.

25 – 2 = 23

23 – 2 = 21

21 – 2 = 19

19 – 2 = 17

Therefore, the missing numbers are 19, 17

Example 2

Find the missing number in the following pattern:
750, 600, 450, 300, 150, __

The next number is obtained by subtracting 150 from the previous number.

750 – 150 = 600

600 – 150 = 450

450 – 150 = 300

300 – 150 = 150

150 – 150 = 0

Therefore, the missing number is 0

Example 3

Find the missing number in the following number pattern:
45, 41, 37, 33, __

The missing number in this pattern is obtained by subtracting 4 from the previous number.

45 – 4 = 41
41 – 4 = 37
37 – 4 = 33
33 – 4 = 29
Therefore, the missing number is 29

Exercise 3

Fill in the missing numbers in the following patterns:

1. 14, 12, 10, 8, ___, ____, ___
2. 23, 20, ___, 14, 11, ___, ____
3. 56, 54, 52, ___, ___, ____, 44
4. 69, 60, 51, 42, 33, ___, ____, ___
5. 95, 85, 75, ____, 55, 45, ___, ____, 15
6. 260, 250, 240, 230, 220, 210, ___, ____, ___
7. 433, 430, ____, 424, ____, 418, 415, ___
8. 1 027, 1 023, ____, 1 015, ____, 1 007, ___
9. 2 398, 2 390, 2 382, ___, ___, 2 358, 2 350, 2 342, ___
10. 52 552, 51 552, ____, ___, 48 552, 47 552, ___, 45 552

Number patterns formed by multiplication

Example 1

Fill in the missing number in the following pattern:
1, 3, 9, 27, __
The next number is obtained by multiplying the previous number by 3.

1 × 3 = 3
3 × 3 = 9
9 × 3 = 27
27 × 3 = 81
Therefore, the missing number is 81

Example 2

Fill in the missing number in the following pattern:

2, 4, 8, 16, 32, __

The next number is obtained by multiplying the previous number by 2.

$2 \times 2 = 4$

$4 \times 2 = 8$

$8 \times 2 = 16$

$16 \times 2 = 32$

$32 \times 2 = 64$

Therefore, the missing number is 64

Exercise 4

Answer the following questions:

1. Fill in the blanks in the following number patterns:

(a) 1, 2, 4, 8, ___, ____

(b) 2, 6, ___, 54, 162, ___

(c) 2, 8, 32, ___, ___

(d) 3, 6, 12, ___, 48, ___

(e) 4, 12, ___, 108, ____

2. Fill in the blanks in the following patterns:

(a) 5, 10, 20, ___, ____, 160

(b) 3, 12, 48, ____

(c) 7, 14, 28, 56, ___, ___

(d) 4, 16, 64, ___

(e) 7, 21, 63, ___, 567

Exercise 5

Answer the following questions:

1. Fill in the blanks in the following patterns:

(a) 17, 21, _____, 29, 33

(b) 71, 66, 61, 56, 51, 46, ___, _____, 31

(c) 100, 75, _____, 25, _____

(d) 0, 20, 40, 60, _____, _____, 120, 140, _____, _____

(e) 20, 15, 10, 5, 0; _____, _____, _____, 5, _____

(f) 8 150, 8 141, 8 132, 8 123, _____, 8 105, _____

2. Write the operation used to form the following number patterns. The first part is done as an example:

(a) 0, 1, 2, 3, 4, 5, 6, 7 Addition

(b) 1, 3, 9, 27, 81, 243, 729 _____

(c) 68, 60, 52, 44, 36, 28, 20 _____

(d) 0, 4, 8, 12, 16, 20, 24, 28 _____

(e) 100, 90, 80, 70, 60, 50, 40, 30, 20, 10, 0 _____

(f) 1, 5, 25, 125 _____

(g) 1 444, 2 444, 3 444, 4 444, 5 444 _____

3. Fill in the missing numbers in the following table. The first row is done as an example:

1	2	3	4	5
	4	6	8	10
3	6		12	
4		12	16	20
5	10		20	25

4. Fill in the blanks in the following pattern:

9 + 1 = 10

99 + 1 = 100

___ + 1 = 1000

9 999 + 1 = _____

Exercise 6

Answer the following questions:

1. Fill in the missing numbers in the following chart:

1	2		4		6	7	8		10
	12	13	14		16	17	18		20
21		23	24		26	27	28		
31	32		34		36	37	38		40
41	42	43			46	47	48		
51	52	53	54		56	57	58		60
61	62	63	64			67	68		70
71	72	73	74		76		78		80
81	82	83	84		86	87			90
91	92	93	94		96	97	98		100

2. Arrange the following numbers in ascending order:

   (a) 140, 150, 120, 90, 100, 130, 110

   (b) 6 225, 5 000, 5 750, 5 500, 5 225, 6 000, 7 000

   (c) 90 000, 95 000, 85 000, 70 000, 80 000, 75 000, 60 000, 65 000

3. Arrange the following numbers in descending order:

   (a) 550, 350, 850, 250, 450, 750, 650

   (b) 66, 22, 33, 11, 77, 88, 44

   (c) 45 000, 67 000, 23 000, 12 000, 78 000, 56 000, 34 000

4. Write a number pattern from 0 to 50 which increases by 5.

5. Write a number pattern from 72 to 0 which decreases by 6.

Summary

1. Patterns of objects follow a specific order.

2. It is important to recognize the type of mathematical operation used in every number pattern before attempting the question.

Chapter Four

Addition of numbers

Introduction

In Standard Three, you learnt the addition of numbers up to four digits. In this chapter, you will learn the addition of numbers up to five digits. This knowledge will help you in buying and selling goods, data collection, solving word problem and other daily life activities.

Exercise 1: Revision

Answer the following questions:

1. 9 327 + 432 = **2.** 8 195 + 1 502 = **3.** 5 362 + 235 =

4. 845 + 5101 = **5.** 9 735 + 235 = **6.** 9 645 + 312 =

7. 4 798 + 2 455 = **8.** 6 845 + 3 101 = **9.** 53 436 + 112 =

10.
3 642
+ 1 235
_____

11.
2 534
+ 2 115
_____

12.
5 476
+ 3 465
_____

13.
7 584
+ 2 103
_____

14.
9 124
+ 812
_____

15.
4 856
+ 4 033
_____

16.
8 870
+ 400
_____

17.
3 741
+ 2 285
_____

18.
7 272
+ 597
_____

19.
4 486
+ 4 398
_____

20.
8 470
+ 804
_____

21.
2 464
+ 5 758
_____

22. Mary bought 2 464 chicks in May 2018. In June 2018, she bought 5 758 chicks. How many chicks did Mary buy in two months?

23. Juma harvested 4 395 mangoes and 226 avocados. How many fruits did he harvest?

Addition of numbers to get sums not exceeding 99 999 without regrouping

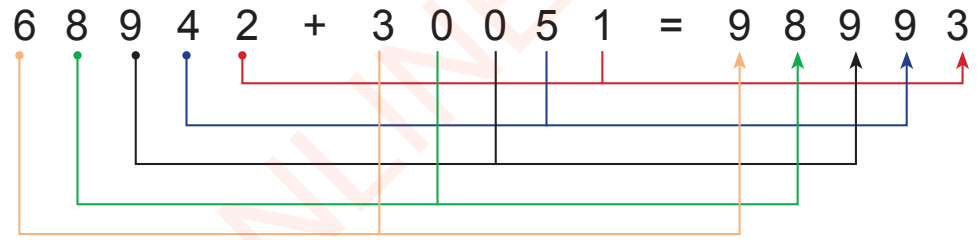
When adding numbers, start to add the number in ones place, followed by numbers in tens, hundreds, thousands and finally in ten thousands place.

Example 1

Add the following numbers horizontally:

68 942 + 30 051 =

Solution



Steps

1. Add ones; 2 + 1 = 3. Write 3 in the ones position.
2. Add tens; 4 + 5 = 9. Write 9 in the tens position.
3. Add hundreds; 9 + 0 = 9. Write 9 in the hundreds position.
4. Add thousands; 8 + 0 = 8. Write 8 in the thousands position.
5. Add ten thousands; 6 + 3 = 9. Write 9 in the ten thousands position.

Therefore, the answer is 98 993.

Example 2

Add the following numbers vertically:

$$\begin{array}{r} 45\,248 \\ +\,20\,231 \\ \hline 65\,479 \end{array}$$

Steps

1.	Align the digits with the same place values.	$\begin{array}{r} 45\,248 \\ +\,20\,231 \\ \hline \\ \hline \end{array}$
2.	Add ones; 8 + 1 = 9. Write 9 in the ones position.	$\begin{array}{r} 45\,248 \\ +\,20\,231 \\ \hline 9 \\ \hline \end{array}$
3.	Add tens; 4 + 3 = 7. Write 7 in the tens position.	$\begin{array}{r} 45\,248 \\ +\,20\,231 \\ \hline 79 \\ \hline \end{array}$
4.	Add hundreds; 2 + 2 = 4. Write 4 in the hundreds position.	$\begin{array}{r} 45\,248 \\ +\,20\,231 \\ \hline 479 \\ \hline \end{array}$
5.	Add thousands; 5 + 0 = 5. Write 5 in the thousands position.	$\begin{array}{r} 45\,248 \\ +\,20\,231 \\ \hline 5\,479 \\ \hline \end{array}$
6.	Add ten thousands; 4 + 2 = 6. Write 6 in the ten thousands position.	$\begin{array}{r} 45\,248 \\ +\,20\,231 \\ \hline 65\,479 \\ \hline \end{array}$

Therefore, the answer is 65 479.

Exercise 2

Answer the following questions:

1. 54 351 + 12 045 =
2. 63 124 + 35 743 =
3. 34 570 + 55 018 =
4. 80 021 + 17 734 =
5. 54 622 + 44 245 =
6. 20 218 + 59 621 =
7. 83 023 + 5 524 =
8. 30 251 + 7 043 =
9. 53 999 + 2 000 =
10. 73 443 + 62 36 =

11. 65 114 + 23 075 = _____
12. 57 043 + 12 744 = _____
13. 62 159 + 20 810 = _____
14. 82 305 + 5 213 = _____
15. 59 261 + 40 712 = _____
16. 84 743 + 12 251 = _____
17. 54 721 + 33 222 = _____
18. 71 236 + 23 451 = _____
19. 56 724 + 3 113 = _____
20. 75 072 + 22 016 = _____
21. 45 507 + 24 362 = _____
22. 56 706 + 23 273 = _____
23. 72 456 + 15 240 = _____
24. 64 175 + 24 621 = _____
25. 43 067 + 30 412 = _____

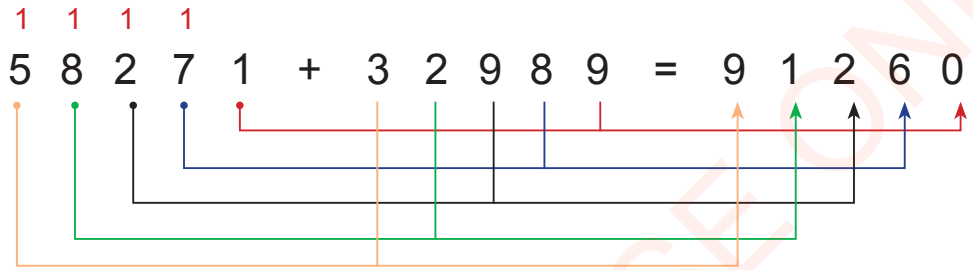
Addition of numbers to get sums not exceeding 99999 by regrouping

Example 1

Add the following numbers horizontally:

58 271 + 32 989 =

Steps



Steps

1. Add ones; 1 + 9 = 10. Write 0 in the ones position and regroup 10 ones into 1 group of tens. Add 1 group of tens to the tens place.
2. Add tens; 1 + 7 + 8 = 16. Write 6 in the tens place and regroup 10 tens into 1 group of hundreds. Add 1 group of hundreds to the hundreds place.
3. Add hundreds; 1 + 2 + 9 = 12. Write 2 in the hundreds place and regroup 10 hundreds into 1 group of thousands. Add 1 group of thousands to the thousands place.
4. Add thousands; 1 + 8 + 2 = 11. Write 1 in the thousands place and regroup 10 thousands into 1 group of ten thousands. Add 1 group of ten thousands to the ten thousands place.
5. Add ten thousands; 1 + 5 + 3 = 9. Write 9 in the ten thousands position.

   Therefore, the answer is 91 260.

Example 2

Add the following numbers vertically:

$$\begin{array}{r} 13\,827 \\ +\ 15\,685 \\ \hline 29\,512 \\ \hline \end{array}$$

Steps

1. Add ones; 7 + 5 = 12. Write 2 in the ones position. Regroup 10 ones into 1 group of tens. Add 1 group of tens to the tens place.

$$\begin{array}{r} {\scriptstyle 1} \\ 13\,827 \\ +\ 15\,685 \\ \hline 2 \end{array}$$

2. Add tens; 1 + 2 + 8 = 11. Write 1 in the tens position. Regroup 10 tens into 1 group of hundreds. Add 1 group of hundreds to the hundreds place.

$$\begin{array}{r} {\scriptstyle 1\,1} \\ 13\,827 \\ +\ 15\,685 \\ \hline 12 \end{array}$$

3. Add hundreds; 1 + 8 + 6 = 15. Write 5 in the hundreds position. Regroup 10 hundreds into 1 group of thousands. Add 1 group of thousands to the thousands place.

$$\begin{array}{r} {\scriptstyle 1\,1\,1} \\ 13\,827 \\ +\ 15\,685 \\ \hline 512 \end{array}$$

4. Add thousands; 1 + 3 + 5 = 9. Write 9 in the thousands position.

$$\begin{array}{r} {\scriptstyle 1\,1\,1} \\ 13\,827 \\ +\ 15\,685 \\ \hline 9\,512 \end{array}$$

5. Add ten thousands; 1 + 1 = 2. Write 2 in the ten thousands position.

Therefore, the answer is 29 512.

$$\begin{array}{r} {\scriptstyle 1\,1\,1} \\ 13\,827 \\ +\ 15\,685 \\ \hline 29\,512 \\ \hline \end{array}$$

Example 3

Add the following numbers vertically:

$$\begin{array}{r} 31\,072 \\ +\ 29\,853 \\ \hline 60\,925 \end{array}$$

Steps

1. Add ones; 2 + 3 = 5. Write 5 in the ones position.

$$\begin{array}{r} 31\,072 \\ +\ 29\,853 \\ \hline 5 \end{array}$$

2. Add tens; 7 + 5 = 12. Write 2 in the tens position. Regroup 10 tens into 1 group of hundreds. Add 1 group of hundreds to the hundreds place.

$$\begin{array}{r} {\scriptstyle 1} \\ 31\,072 \\ +\ 29\,853 \\ \hline 25 \end{array}$$

3. Add hundreds; 1 + 0 + 8 = 9. Write 9 in the hundreds position.

$$\begin{array}{r} {\scriptstyle 1} \\ 31\,072 \\ +\ 29\,853 \\ \hline 925 \end{array}$$

4. Add thousands; 1 + 9 = 10. Write 0 in the thousands position. Regroup 10 thousands into 1 group of ten thousands. Add 1 group of ten thousands to the ten thousands place.

$$\begin{array}{r} {\scriptstyle 1} \\ 31\,072 \\ +\ 29\,853 \\ \hline 0\,925 \end{array}$$

5. Add ten thousands; 1 + 3 + 2 = 6. Write 6 in the ten thousands position.

Therefore, the answer is 60 925.

$$\begin{array}{r} {\scriptstyle 1\ 1} \\ 31\,072 \\ +\ 29\,853 \\ \hline 60\,925 \end{array}$$

Exercise 3

Answer the following questions:

1. 2 636 + 8 345 = _____

2. 47 345 + 17 092 = _____

3. 36 328 + 60 606 = _____

4. 64 646 + 5 371 = _____

5. 36 473 + 8 357 = _____

6. 75 755 + 15 575 = _____

7. 16 661 + 61 836 = _____

8. 15 051 + 8 269 = _____

9. 85 585 + 3 385 = _____

10. 52 534 + 28 888 = _____

11. 45 745 + 6 432 = _____

12. 70 605 + 18 396 = _____

13. 29 327 + 10 191 = _____

14. 55 288 + 32 945 = _____

15. 25 552 + 48 180 = _____

16. 24 042 + 38 977 = _____

17. 38 373 + 36 789 = _____

18. 16 615 + 66 997 = _____

19. 48 488 + 20 011 = _____

20. 40 976 + 32 948 = _____

21. 82 466 + 718 = _____

Exercise 4

Answer the following questions:

1. 53 415 + 21 045 =

2. 64 124 +16 283 =

3. 75 520 + 9 221 =

4. 66 612 + 24 588 =

5. 48 434 + 23 537 =

6. 67 456 + 11 553 =

7. 53 656 + 6 667 =

8. 59 816 + 32 275 =

9. 43 892 + 8 329 =

10. 77 999 + 10 001 =

11.
  57 336
+ 12 217

12.
  55 376
+ 21 206

13.
  81 858
+ 12 141

14.
  64 599
+ 16 433

15.
  48 879
+ 22 300

16.
  48 289
+ 3 457

17.
  66 478
+ 24 310

18.
  39 892
+ 10 108

19.
  76 457
+ 13 023

20.
  61 823
+ 27 278

21.
  58 508
+ 39 990

22.
  87 735
+ 5 486

23.
  44 876
+ 26 035

24.
  85 519
+ 2 791

25.
  18 702
+ 79 308

Word problems on addition

Example 1

A certain national park in Tanzania was reported to have 78 696 zebras and 2 323 buffaloes. What is the total number of zebras and buffaloes in the national park altogether?

Solution

Number of zebras = 78 696
Number of buffaloes = 2 323
Add the numbers to get the total. That is,

$$\begin{array}{r} 78\,696 \\ +\ 2\,323 \\ \hline 81\,019 \end{array}$$

Therefore, there are 81 019 zebras and buffaloes in the national park.

Example 2

Chunya district has 24 751 Mathematics and 74 552 Kiswahili books in its schools. How many Mathematics and Kiswahili books does Chunya district have altogether?

Solution

Number of Mathematics books = 24 751
Number of Kiswahili books = 74 552
Add the numbers to get the total. That is,

$$\begin{array}{r} 24\,751 \\ +\ 74\,552 \\ \hline 99\,303 \end{array}$$

Therefore, Chunya district has a total of 99 303 Mathematics and Kiswahili books.

Exercise 5

Answer the following questions:

1. A farmer stored 25 677 kilograms of maize in 2017 and 21 913 kilograms of maize in 2018. How many kilograms of maize were stored altogether?
2. A farmer sold 35 752 litres of milk in January and 27 888 litres of milk in February. How many litres of milk were sold in two months?
3. The youth group planted 27 698 apple seedlings and 53 564 orange seedlings. How many seedlings were planted by the youth group?
4. Kombe gave his daughter 45 500 shillings for expenditure during the first term. In the second term, he gave her 50 000 shillings. How much money did he give her daughter both terms?
5. Mwajuma's family used 5 876 litres of water in the first year and 6 328 litres in the second year. How many litres of water did the family use both years?
6. A doctor attended 78 patients on Monday and 63 patients on Tuesday. How many patients were attended by the doctor in both days?
7. An inspection of 9 436 cars was carried out in a certain region. Another region inspected 10 130 cars. How many cars were inspected in both regions?
8. In the year 2016, Twendepamoja ward primary schools enrolled 1 050 pupils. In the same year Mwembetogwa ward primary schools enrolled 889 pupils. How many pupils were enrolled in both wards?

Summary

1. To add two or more numbers, align the digits horizontally or vertically.
2. Add the digits of the numbers from right to left.

Chapter Five

Subtraction of numbers

Introduction

In Standard Three, you learnt subtraction of numbers up to four digits. In this chapter, you will learn subtraction of numbers up to five digits. The knowledge of subtraction is used in your daily activities such as travelling, time, cooking, business and other real life activities.

Exercise 1: Revision

Answer the following questions:

1. 536 – 111 =

2. 935 – 235 =

3. 9 945 – 4 633 =

4. 4 798 – 2 455 =

5. 4 798 – 2 455 =

6. 6 845 – 5 101=

7.
$$\begin{array}{r} 158 \\ -\ 111 \\ \hline \\ \hline \end{array}$$

8.
$$\begin{array}{r} 789 \\ -\ 255 \\ \hline \\ \hline \end{array}$$

9.
$$\begin{array}{r} 567 \\ -\ 246 \\ \hline \\ \hline \end{array}$$

10.
$$\begin{array}{r} 659 \\ -\ 185 \\ \hline \\ \hline \end{array}$$

11.
$$\begin{array}{r} 8\,694 \\ -\ 1\,562 \\ \hline \\ \hline \end{array}$$

12.
$$\begin{array}{r} 8\,767 \\ -\ 6\,433 \\ \hline \\ \hline \end{array}$$

13.
$$\begin{array}{r} 6195 \\ -\ 512 \\ \hline \\ \hline \end{array}$$

14.
$$\begin{array}{r} 8\,195 \\ -\ 1\,507 \\ \hline \\ \hline \end{array}$$

15.
$$\begin{array}{r} 5\,328 \\ -\ 1\,111 \\ \hline \\ \hline \end{array}$$

16.
$$\begin{array}{r} 4\,224 \\ -\ 1\,233 \\ \hline \\ \hline \end{array}$$

17.
$$\begin{array}{r} 5\,454 \\ -\ 1\,465 \\ \hline \\ \hline \end{array}$$

18.
$$\begin{array}{r} 2\,662 \\ -\ 672 \\ \hline \\ \hline \end{array}$$

19. A school has 465 pupils. If 253 pupils are boys, how many girls are there?

20. A farmer has 354 cows and 253 goats. What is the difference between the number of cows and goats?

Subtraction of numbers

Numbers can be subtracted by vertical or horizontal arrangement by considering the alignment of position of the digits.

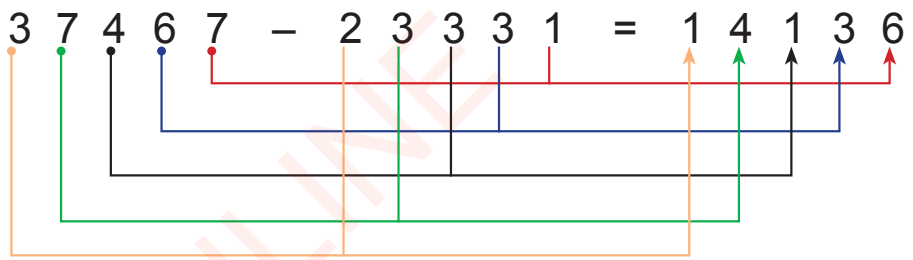
Subtraction of numbers without regrouping

Example 1

Subtract the following numbers horizontally:

37 467 – 23 331 =

Solution



Steps

1. Subtract ones; 7 – 1 = 6. Write 6 in the ones position.
2. Subtract tens; 6 – 3 = 3. Write 3 in the tens position.
3. Subtract hundreds; 4 – 3 = 1. Write 1 in the hundreds position.
4. Subtract thousands; 7 – 3 = 4. Write 4 in the thousands position.
5. Subtract ten thousands; 3 – 2 = 1. Write 1 in the ten thousands position.

Therefore, the answer is 14 136.

Example 2

Subtract the following numbers vertically:

$$\begin{array}{r} 65\,376 \\ -\ 21\,145 \\ \hline 44\,231 \end{array}$$

Steps

1. Subtract ones; 6 – 5 = 1. Write 1 in the ones position.

$$\begin{array}{r} 65\,376 \\ -21\,145 \\ \hline 1 \end{array}$$

2. Subtract tens; 7 – 4 = 3. Write 3 in the tens position.

$$\begin{array}{r} 65\,376 \\ -\ 21\,145 \\ \hline 31 \end{array}$$

3. Subtract hundreds; 3 – 1 = 2. Write 2 in the hundreds position.

$$\begin{array}{r} 65\,376 \\ -21\,145 \\ \hline 231 \end{array}$$

4. Subtract thousands; 5 –1 = 4. Write 4 in the thousands position.

$$\begin{array}{r} 65\,376 \\ -21\,145 \\ \hline 4\,231 \end{array}$$

5. Subtract ten thousands; 6 – 2 = 4. Write 4 in the ten thousands position.

$$\begin{array}{r} 65\,376 \\ -\ 21\,145 \\ \hline 44\,231 \end{array}$$

Therefore, the answer is 44 231.

Exercise 2

Answer the following questions:

1. 65 458 – 21 344 =
2. 87 999 – 33 422 =
3. 54 762 – 44 620 =
4. 75 555 – 24 521 =
5. 45 679 – 5 623 =
6. 56 454 – 11 111 =
7. 72 716 – 70 606 =
8. 83 335 – 63 212 =
9. 86 565 – 65 434 =
10. 77 653 – 34 322 =

11. 85 446 – 72 234 =

12. 43 346 – 32 116 =

13. 89 967 – 67 866 =

14. 58 766 – 38 564 =

15. 95 437 – 33 335 =

16. 98 778 – 86 378 =

17. 34 788 – 23 687 =

18. 46 796 – 43 655 =

19. 47 683 – 16 232 =

20. 69 635 – 58 313 =

21. 75 757 – 25 252 =

22. 99 991 – 4 340 =

Subtraction of numbers by regrouping

Example

$$\begin{array}{r} 57\,693 \\ -\ 34\,564 \\ \hline 23\,129 \\ \hline \end{array}$$

Steps

1. Subtract ones; 3 – 4, it is not sufficient. Take 1 group of tens from 9 tens, and regroup it into ones to get 10 ones. Add ones; 10 + 3 = 13.

   Now subtract ones; 13 – 4 = 9. Write 9 in the ones position. Remember 8 tens remained in the tens place.

$$\begin{array}{r} {\scriptstyle 8\ 13} \\ 57\,6\not{9}\not{3} \\ -\ 34\,564 \\ \hline 9 \\ \hline \end{array}$$

2. Subtract tens; 8 – 6 = 2. Write 2 in the tens position.

$$\begin{array}{r} {\scriptstyle 8\ 13} \\ 57\,6\not{9}\not{3} \\ -\ 34\,564 \\ \hline 29 \\ \hline \end{array}$$

3. Subtract hundreds; 6 – 5 = 1. Write 1 in the hundreds position.

$$\begin{array}{r} {\scriptstyle 8\ 13} \\ 57\,6\not{9}\not{3} \\ -\ 34\,564 \\ \hline 129 \\ \hline \end{array}$$

4. Subtract thousands; 7 – 4 = 3. Write 3 in the thousands position.

$$\begin{array}{r} {\scriptstyle 8\ 13} \\ 57\,6\not{9}\not{3} \\ -\ 34\,564 \\ \hline 3\,129 \\ \hline \end{array}$$

5. Subtract ten thousands; 5 – 3 = 2. Write 2 in the ten thousands position.

$$\begin{array}{r} {\scriptstyle 8\ 13} \\ 57\,6\not{9}\not{3} \\ -\ 34\,564 \\ \hline 23\,129 \\ \hline \end{array}$$

Therefore, the answer is 23 129.

Exercise 3

Answer the following questions:

1. 85 446 − 2 254 = _____

2. 44 346 − 37 016 = _____

3. 78 268 − 56 186 = _____

4. 53 766 − 31 584 = _____

5. 40 237 − 33 307 = _____

6. 94 176 − 86 367 = _____

7. 32 229 − 13 624 = _____

8. 46 223 − 43 655 = _____

9. 47 625 − 16 232 = _____

10. 64 536 − 58 323 = _____

11. 55 376 − 25 445 = _____

12. 60 474 − 32 137 = _____

13. 85 244 − 74 853 = _____

14. 42 302 − 34 734 = _____

15. 16 324 − 15 532 = _____

16. 31 144 − 25 839 = _____

17. 76 437 − 37 935 = _____

18. 92 743 − 65 365 = _____

19. 47 515 − 26 753 = _____

20. 53 846 − 51 342 = _____

21. 93 767 − 16 238 = _____

22. 87 536 − 66 743 = _____

23. 94 085 − 77 342 = _____

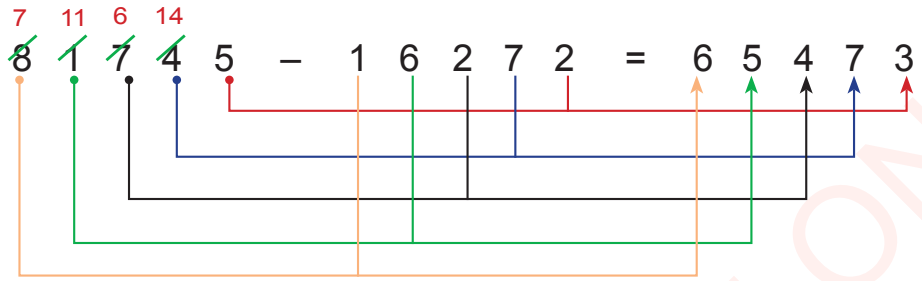
24. 36 784 − 19 438 = _____

Example 1

Subtract the following numbers horizontally:

81 745 – 16 272 =

Solution



Steps

1. Subtract ones; 5 – 2 = 3. Write 3 in the ones position.
2. Subtract tens; 4 – 7; it is not sufficient. Take 1 group of hundreds from 7 hundreds and regroup it into tens to get 10 tens. Add tens; 10 + 4 = 14. Now, subtract tens; 14 – 7 = 7. Write 7 in the tens position. Remember, 6 hundreds remained in hundreds place.
3. Subtract hundreds; 6 – 2 = 4. Write 4 in the hundreds position.
4. Subtract thousands; 1 – 6, it is not sufficient. Take 1 group of ten thousands from 8 ten thousands and regroup it into thousands to get 10 thousands. Add thousands; 10 + 1 = 11.

   Now, subtract thousands; 11 – 6 = 5. Write 5 in the thousands position. Remember, 7 ten thousands remained in the ten thousands place.
5. Subtract ten thousands; 7 – 1 = 6. Write 6 in the ten thousands position.

   Therefore, the answer is 65 473.

Example 2

Subtract the following numbers vertically:

$$\begin{array}{r} 76\ 953 \\ -\ 42\ 367 \\ \hline 34\ 586 \end{array}$$

Steps

1. Subtract ones; 3 – 7, it is not sufficient. Take 1 group of tens from 5 tens and regroup it into ones to get 10 ones. Add ones; 10 + 3 = 13. Now, subtract ones; 13 – 7 = 6. Write 6 in the ones position. Remember, 4 tens remained in the tens place.

$$\begin{array}{r} {\scriptstyle 4\ 13} \\ 76\ 9\not{5}\not{3} \\ -\ 42\ 367 \\ \hline 6 \end{array}$$

2. Subtract tens; 4 – 6, it is not sufficient. Take 1 group of hundreds from 9 hundreds and regroup it into tens to get 10 tens. Add tens; 10 + 4 = 14. Now, subtract tens; 14 – 6 = 8. Write 8 in the tens position. Remember, 8 hundreds remained in the hundreds place.

$$\begin{array}{r} {\scriptstyle 8\ 14\ 13} \\ 76\ \not{9}\not{5}\not{3} \\ -\ 42\ 367 \\ \hline 86 \end{array}$$

3. Subtract hundreds; 8 – 3 = 5. Write 5 in the hundreds position.

$$\begin{array}{r} {\scriptstyle 8\ 14\ 13} \\ 76\ \not{9}\not{5}\not{3} \\ -\ 42\ 367 \\ \hline 586 \end{array}$$

4. Subtract thousands; 6 – 2 = 4. Write 4 in the thousands position.

$$\begin{array}{r} {\scriptstyle 8\ 14\ 13} \\ 76\ \not{9}\not{5}\not{3} \\ -\ 42\ 367 \\ \hline 4\ 586 \end{array}$$

5. Subtract ten thousands; 7 – 4 = 3. Write 3 in the ten thousands position.

$$\begin{array}{r} {\scriptstyle 8\ 14\ 13} \\ 76\ \not{9}\not{5}\not{3} \\ -\ 42\ 367 \\ \hline 34\ 586 \end{array}$$

Therefore, the answer is 34 586.

Example 3

Subtract the following numbers vertically:

$$\begin{array}{r} {\scriptstyle 7\ \ 8\ \ 15\ 9\ 10} \\ \cancel{8}\cancel{0}\ \cancel{6}\cancel{0}\cancel{0} \\ -\ 52\ 843 \\ \hline 27\ 757 \\ \hline \end{array}$$

Therefore, the answer is 27 757.

Exercise 4

Answer the following questions:

1. 75 223 − 2 234 = _____

2. 43 341 − 33 226 = _____

3. 79 701 − 58 812 = _____

4. 43 756 − 28 567 = _____

5. 95 327 − 33 628 = _____

6. 98 776 − 96 378 = _____

7. 34 666 − 13 687 = _____

8. 64 485 − 23 699 = _____

9. 34 110 − 14 219 = _____

10. 50 202 − 47 313 = _____

11. 88 965 − 69 866 = _____

12. 48 756 − 28 567 = _____

13. 70 331 − 5 524

14. 86 521 − 27 780

15. 97 214 − 69 325

16. 80 500 − 25 839

17. 70 000 − 2 764

18. 80 600 − 44 044

Word problems on subtraction

Example 1

A baker baked 72 324 loaves of bread. One day the bakery sold 45 458 loaves of bread. How many loaves of bread were not sold?

Solution

Total number of loaves of bread baked = 72 324
Number of loaves of bread sold = 45 458
Subtract the numbers to get the difference;

$$\begin{array}{r} 72\,324 \\ -\ 45\,458 \\ \hline 26\,866 \end{array}$$

Therefore, 26 866 loaves of bread were not sold.

Example 2

A total of 42 324 people went to the hospital for eyes test. If 21 505 were identified to have eyes problems, how many people did not have eyes problems?

Solution

Total number of people tested = 42 324
Number of people with eyes problems = 21 505
Subtract the numbers to get the number of people with no eyes problem;

$$\begin{array}{r} 42\ 324 \\ -\ 21\ 505 \\ \hline 20\ 819 \end{array}$$

Therefore, 20 819 people had no eyes problems.

Exercise 5

Answer the following questions:

1. A total of 56 328 people tested for malaria at a certain hospital. If 29 446 had malaria, how many people did not have malaria?
2. A business person has ordered 68 724 packets of salt from industry. If he received 24 388 packets, how many packets are not yet received?
3. Mr and Mrs Joshua had 77 000 fruit plants in their farm. If 25 780 plants were destroyed by insects, how many plants were not destroyed?
4. Last year, 52 024 road accidents occurred in a certain country. If 28 050 accidents involved pedestrians, how many accidents did not involve pedestrians?
5. Mufindi district planted 80 400 trees and Kilolo district planted 69 500 trees. What is the difference of trees planted by the two districts?
6. Asia has 25 409 fishes in her garden pond. If she sells 21 867 fishes, how many fishes remained in the pond?

7. Kasulu district enrolled 55 750 primary school pupils.
   If 22 462 pupils were girls, how many pupils were boys?
8. A water tank in a village receives 73 452 litres everyday. If 54 243 litres are used every day, how many litres of water remain in the tank?
9. Kobelo's salary is 99 840 shillings per month. If Kobelo's monthly expenditure is 89 799 shillings, how much money does he save every month?
10. Mkude harvested 56 544 pineapples from her farm. If 45 544 pineapples were sold at a profit, how many pineapples sold at a loss?

Summary

1. To subtract numbers, you have to align the numbers horizontally or vertically.
2. Subtract the numbers from right to left.

Chapter Six

Multiplication of numbers

Introduction

In Standard Three, you learnt how to multiply whole numbers with two digits by whole numbers with one digit. In this chapter, you will learn how to multiply whole numbers with three digits by whole numbers with two digits. You will also solve real life word problems which involve multiplication. This knowledge will help you to calculate the product and be able to find a variety of sums, to know the number of days in a week, weeks in a month, months in a year, and so on.

Exercise 1: Revision

Answer the following questions:

1. $6 \times 4 =$

2. $8 \times 3 =$

3. $9 \times 4 =$

4. $5 \times 5 =$

5. $11 \times 2 =$

6. $16 \times 3 =$

7.
$$\begin{array}{r} 14 \\ \times\ 2 \\ \hline \\ \hline \end{array}$$

8.
$$\begin{array}{r} 15 \\ \times\ 2 \\ \hline \\ \hline \end{array}$$

9.
$$\begin{array}{r} 34 \\ \times\ 2 \\ \hline \\ \hline \end{array}$$

10.
$$\begin{array}{r} 40 \\ \times\ 2 \\ \hline \\ \hline \end{array}$$

11.
$$\begin{array}{r} 37 \\ \times\ 0 \\ \hline \\ \hline \end{array}$$

12.
$$\begin{array}{r} 25 \\ \times\ 3 \\ \hline \\ \hline \end{array}$$

13. Fill the following multiplication table:

For example: 4 × 7 = 28

×	1	2	3	4	5	6	7	8	9
1						6			
2									
3									
4									
5									
6						36			
7				28					
8									
9									
10									
11									
12									

Multiplication of two digit numbers by a multiplier with two digits without regrouping

Example 1

23 × 21 =

Steps

1. 1 × 3 = 3 ones. Write 3 in the ones position.

$$\begin{array}{r} 23 \\ \times\ 21 \\ \hline 3 \end{array}$$

2. 1 × 2 = 2 tens. Write 2 in the tens position.

$$\begin{array}{r} 23 \\ \times\ 21 \\ \hline 23 \end{array}$$

3. 2 × 3 = 6 tens. Write 6 in the tens position and 0 in the ones position.	23 × 21 23 60
4. 2 × 2 = 4 hundreds. Write 4 in the hundreds position.	23 × 21 23 460
5. Add; 23 + 460 = 483.	23 × 21 23 + 460 483
Therefore, the answer is 483.	

Example 2

32 x 13 =

Steps

1. 3 × 2 = 6 ones. Write 6 in the ones position.	32 × 13 6
2. 3 × 3 = 9 tens. Write 9 in the tens position.	32 × 13 96

3.	1 × 2 = 2 tens. Write 2 in the tens position and 0 in the ones position.	32 × 13 96 20
4.	1 × 3 = 3 hundreds. Write 3 in the hundreds position.	32 × 13 96 320
5.	Add; 96 + 320 = 416.	32 × 13 96 + 320 416

Therefore, the answer is 416.

Exercise 2

Answer the following questions:

1. 22 × 14 = ____

2. 12 × 12 = ____

3. 11 × 13 = ____

4. 14 × 12 = ____

5. 13 × 13 = ____

6. 33 × 33 = ____

7. 40 × 12 = ____

8. 42 × 12 = ____

9. 32 × 11 = ____

10. 41 × 22 = _____

11. 32 × 22 = _____

12. 32 × 32 = _____

Multiplication of numbers by regrouping

Example 1

Multiply the following numbers:

27 × 12 =

Steps

1. 2 × 7 = 14 ones. Write 4 in the ones position. Regroup 10 ones into 1 group of tens. Remember to add 1 tens to the tens.

```
  27
× 12
   4
```

2. 2 × 2 = 4 tens. Add tens; 1 + 4 = 5. Write 5 in the tens position.

```
  27
× 12
  54
```

3. 1 × 7 = 7 tens. Write 7 in the tens position and 0 in the ones position.

```
  27
× 12
  54
+ 70
```

4. 1 × 2 = 2 hundreds. Write 2 in the hundreds position.

```
  27
× 12
  54
+ 270
-----
```

5. Add; 54 + 270 = 324.

```
  27
× 12
  54
+270
 324
```

Therefore, the answer is 324.

Example 2

Multiply the following numbers:

78 × 69 =

Steps

1. 9 × 8 = 72 ones. Write 2 in the ones position. Regroup 70 ones into 7 groups of tens. Remember to add 7 tens to the tens.

```
  78
× 69
   2
```

2. 9 × 7 = 63 tens. Add tens; 63 + 7 = 70. Write 0 in the tens position. Regroup 70 tens into 7 hundreds. Write 7 in the hundreds position.

```
  78
× 69
 702
```

3. 6 × 8 = 48 tens. Write 0 in the ones position and 8 in the tens position. Regroup 40 tens into 4 hundreds. Remember to add 4 hundreds to the hundreds.

```
  78
× 69
 702
+ 80
```

4. 6 × 7 = 42 hundreds. Add hundreds; 42 + 4 = 46. Write 6 in the hundreds position and 4 in the thousands position.

```
  78
× 69
 702
+4 680
```

5. Add; 702 + 3 680 = 5 382

$$\begin{array}{r} 78 \\ \times\ 69 \\ \hline 702 \\ +\ 4\,680 \\ \hline 5\,382 \end{array}$$

Therefore, the answer is 5 382.

Exercise 3

Answer the following questions:

1. 25 × 12 =

2. 37 × 31 =

3. 62 ×13 =

4. 51 × 22 =

5. 56 × 29 =

6. 74 × 53 =

7.
$$\begin{array}{r} 47 \\ \times\ 18 \\ \hline \\ \hline \end{array}$$

8.
$$\begin{array}{r} 53 \\ \times\ 34 \\ \hline \\ \hline \end{array}$$

9.
$$\begin{array}{r} 65 \\ \times\ 24 \\ \hline \\ \hline \end{array}$$

10.
$$\begin{array}{r} 85 \\ \times\ 60 \\ \hline \\ \hline \end{array}$$

11.
$$\begin{array}{r} 97 \\ \times\ 88 \\ \hline \\ \hline \end{array}$$

12.
$$\begin{array}{r} 84 \\ \times\ 93 \\ \hline \\ \hline \end{array}$$

13.
$$\begin{array}{r} 56 \\ \times\ 23 \\ \hline \\ \hline \end{array}$$

14.
$$\begin{array}{r} 29 \\ \times\ 33 \\ \hline \\ \hline \end{array}$$

15.
$$\begin{array}{r} 46 \\ \times\ 46 \\ \hline \\ \hline \end{array}$$

16.
$$\begin{array}{r} 65 \\ \times\ 75 \\ \hline \\ \hline \end{array}$$

17.
$$\begin{array}{r} 85 \\ \times\ 43 \\ \hline \\ \hline \end{array}$$

18.
$$\begin{array}{r} 57 \\ \times\ 74 \\ \hline \\ \hline \end{array}$$

19. 63 × 50

20. 96 × 78

21. 20 × 10

22. 10 × 10

23. 30 × 51

24. 19 × 55

Multiplication of three digit numbers by a multiplier with one digit

Example

Multiply the following numbers:

217 × 4 =

Steps

1. 4 × 7 = 28 ones. Write 8 in the ones position. Regroup 20 ones into 2 group of tens. Remember to add 2 tens to the tens.

```
 217
×  4
---
   8
```

2. 4 × 1 = 4 tens. Add tens; 4 + 2 = 6. Write 6 in the tens position.

```
 217
×  4
---
  68
```

3. 4 × 2 = 8 hundreds. Write 8 in the hundreds position.

```
 217
×  4
---
 868
```

Therefore, the answer is 868.

Exercise 4

Answer the following questions:

1. 710×5

2. 348×8

3. 213×6

4. 376×3

5. 151×7

6. 385×4

7. 213×8

8. 760×3

9. 245×9

10. 717×7

11. 188×7

12. 678×5

13. 525×5

14. 463×6

15. 775×7

16. 905×8

17. 837×5

18. 999×9

19. 456×7

20. 789×6

21. 324×8

22. 631×9

23. 774×5

24. 850×6

Multiplication of three digit numbers by a multiplier with two digits

Example

Multiply the following numbers:

624 × 35 =

Steps

1. 624 × 5 ones = 3 120	624 × 35 3 120
2. 624 × 3 tens = 18 720	+ 18 720
3. Add; 3 120 + 18 840 = 21 840.	21 840
Therefore, the answer is 21 840.	

Exercise 5

Answer the following questions:

1. 417 × 11 =	2. 130 × 70 =	3. 292 × 37 =
4. 100 × 10 =	5. 500 × 40 =	6. 810 × 10 =
7. 345 × 85 =	8. 359 × 79 =	9. 916 × 58 =
10. 999 × 97 =	11. 304 × 33 =	12. 675 × 55 =
13. 742 × 79 =	14. 379 × 27 =	15. 174 × 71 =
16. 486 × 43 =	17. 737 × 35 =	18. 837 × 61=
19. 496 × 63 =	20. 515 × 46 =	

Word problems on multiplication

Example 1

Katale primary school has 9 streams. Each stream has 35 pupils. Find the total number of pupils in the school.

Solution

Number of pupils per stream = 35

Number of streams = 9

Multiply 35 by 9 to get the total number of pupils. That is,

$$\begin{array}{r} 35 \\ \times\ 9 \\ \hline 315 \end{array}$$

Therefore, there are 315 pupils at the school.

Example 2

A business person bought 7 cartons of soap. If each carton has 12 bars of soap, how many bars of soap did she buy?

Solution

Number of cartons = 7

1 carton = 12 bars of soap

Multiply 12 by 7 to get the total number of bars of soap. That is,

$$12 \times 7 = 84$$

Therefore, she bought 84 bars of soap.

Example 3

Standard four class at Kihesa Primary School has 3 streams. Each stream has 20 desks. If each desk is used by 2 pupils, how many pupils are there in the class?

Solution

Number of streams = 3

Number of desks in each stream = 20

Total number of desk = 3 × 20 = 60

Number of pupils in each desk = 2

Total number of pupils = 2 × 3 × 20 = 120

Therefore, there are 120 pupils in the class.

Exercise 6

Answer the following questions:

1. A school lorry carries 60 sacks of beans in one trip. How many sacks will be carried in 19 trips?
2. At Mtakuja hospital, an average of 28 children are born every week. Find the total number of children born in 12 weeks. ?
3. One crate of soda has 24 bottles. The price of 1 bottle of soda is 500 shillings. Find the price of one crate of soda.
4. Which product is greater between 678 × 23 and 410 × 39?
5. One matchbox has 35 matchsticks. How many matchsticks do 10 matchboxes have?

6. A certain village conducted a campaign to raise the number of desks in a school. If 207 families pledged to contribute 11 pieces of timber each, how many pieces of timbers will the village get?
7. A business person got a profit of 55 shillings from selling 1 kilogram of rice. How much profit will he get from selling 392 kilograms of rice?
8. The government provided maize to 73 families affected by drought. Each family received 180 kilograms of maize. How many kilograms of maize did the government provide?
9. Mfaume has 98 chickens. Each chicken lays two eggs every day. How many eggs are laid by the chickens in a week?
10. Ali has a tomato and carrot garden. Tomato seedlings are planted on 30 beds. Each bed has 12 tomato seedlings. Carrot seedlings are planted on 19 beds. Each bed has 15 carrot seedlings. How many seedlings are in the garden?
11. A book has 58 pages. Every page has 32 printed lines. Each line contains 10 words. How many words are in the book?

Summary

1. When multiplying numbers, align the digits of each number vertically or horizontally.
2. Multiply all the digits from ones, tens and hundreds.
3. A multiplier is a number which is used to multiply another number.

Chapter Seven

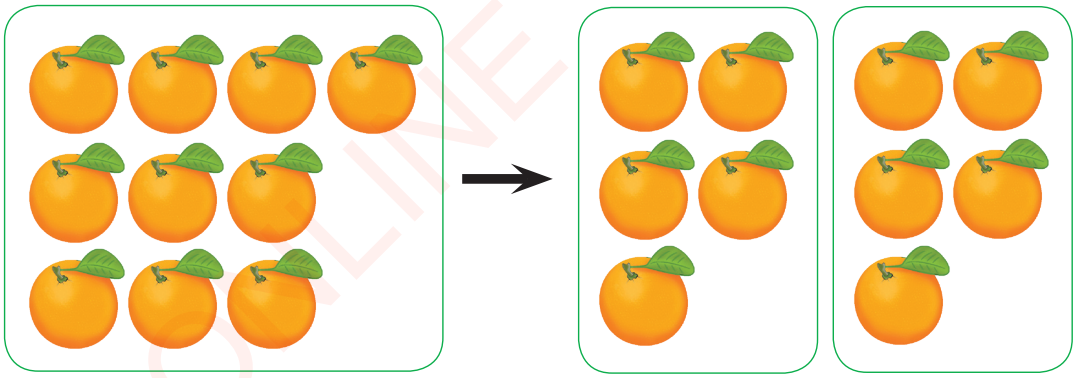
Division of numbers

Introduction

In this chapter, you will learn division of numbers with three digits by numbers with two digits. Also, you will learn how to solve word problems which involve the concept of division. This competence will help you to divide things like fruits, sweets and other objects found in your daily life activities.

Division of objects

Ten oranges has been divided equally into two groups as shown in the following figure:



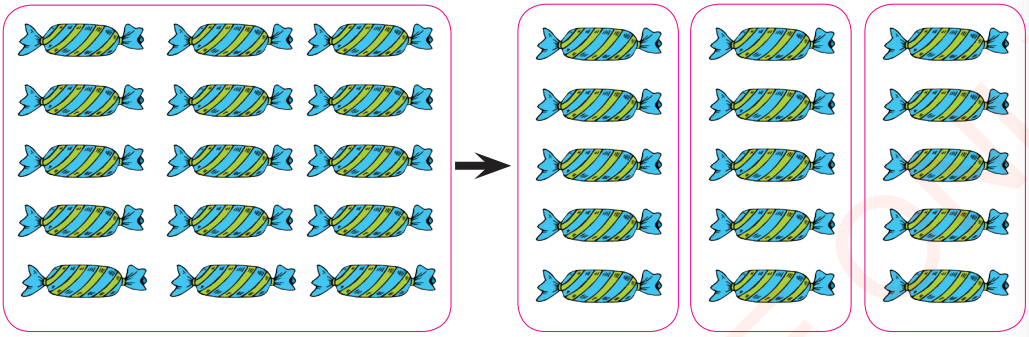
One group *Two groups*

Therefore, 10 oranges have been equally divided into two groups of 5 oranges each.

Example 1

Kimweli, Maimuna and Pendo shared 15 sweets equally. How many sweets did everyone get?

Solution



One group *Three groups*

When dividing objects, its better to divide one by one in rounds. For example, take one sweet give it to Kimweri, then take another sweet give it to Maimuna and the other give it to Pendo. Therefore, for the first round you have divided three sweets. Do it by rounds until all sweets finished and count everyone got how many sweets.

Activity

Use 100 bottle tops to do the following:

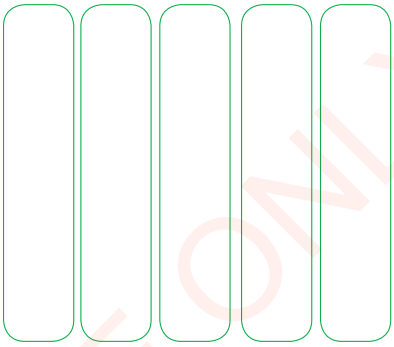
1. Divide 30 bottle tops equally into 6 groups. How many bottle tops are in each group?
2. Divide 84 bottle tops equally into 12 groups. How many bottle tops are in each group?
3. Divide 96 bottle tops equally into 3 groups. How many bottle tops are in each group?

Exercise 1

Answer the following questions:

1. Divide 15 mangoes equally into 5 groups.

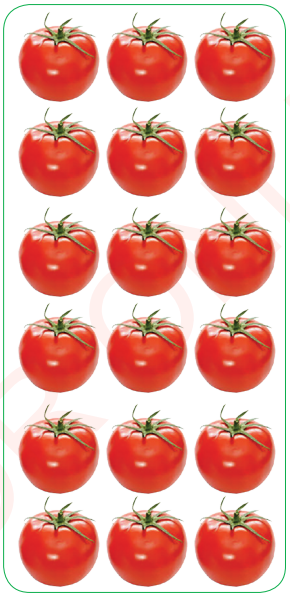
Divide by 5 =



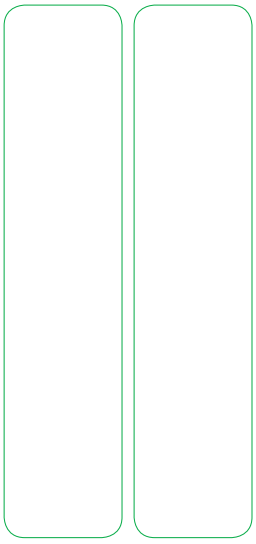
Groups

How many mangoes are in each group?

2. Divide 18 tomatoes equally into 2 groups.



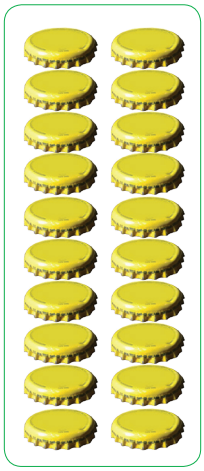
Divide by 2 =



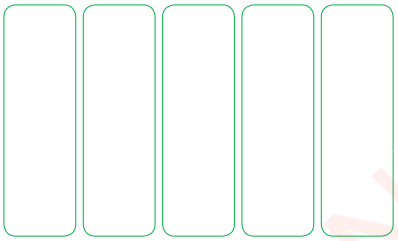
Groups

How many tomatoes are in each group?

3. Divide 20 bottle tops equally into 5 groups.



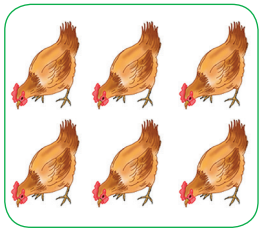
Divide by 5 =



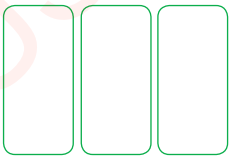
Groups

How many bottle tops are in each group?

4. Divide 6 chickens equally into 3 groups.



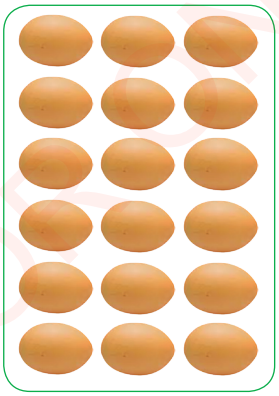
Divide by 3 =



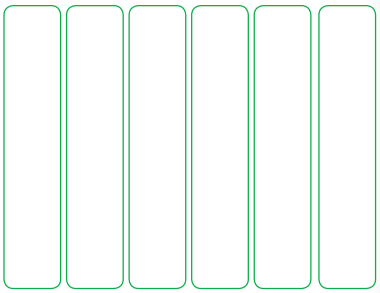
Groups

How many chickens are in each group?

5. Divide 18 eggs equally into 6 groups.



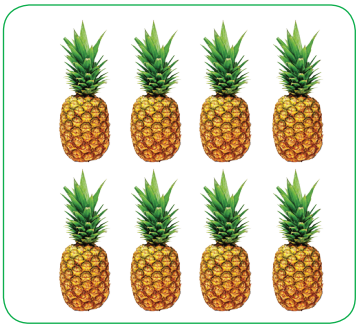
Divide by 6 =



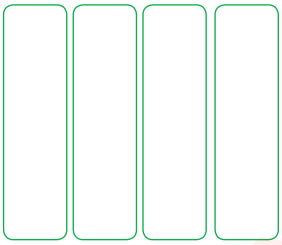
Groups

How many eggs are in each group?

6. Divide 8 pineapples equally into 4 groups.



Divide by 4 =



Groups

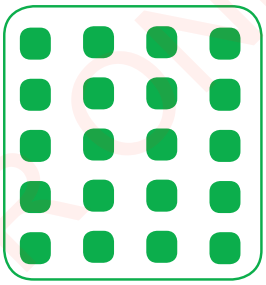
How many pineapples are in each group?

Division of numbers

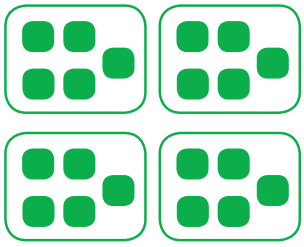
Division of numbers is the process of putting numbers or objects into equal parts. The mathematical operation used for division is ÷. Thus, A divide by B is written A ÷ B.

Example

When dividing 20 objects by 4, it means arrange 20 objects into 4 equal groups.



Divide by 4 =



Groups

There are 4 groups. Each group has 5 objects.
Therefore, 20 ÷ 4 = 5

Exercise 2

Answer the following questions:

1. If you divide 14 apples equally into 7 groups, how many apples will be in each group?
2. Five people want to share 20 loaves of bread equally. How many loaves of bread will every person get?
3. Thirty carrots were divided equally into 10 groups. How many carrots did each group get?
4. Suppose 42 exercise books were divided to 7 pupils, how many exercise books did each one get?
5. If thirty-six chapatti were divided to 12 people, how many chapatti did each one get?

Division by repeated subtraction

Example

Example of division by subtraction.

$20 \div 4 = 5$

(i) $20 - 4 = 16$

(ii) $16 - 4 = 12$

(iii) $12 - 4 = 8$

(iv) $8 - 4 = 4$

(v) $4 - 4 = 0$

Therefore, there is 4 five in 20.

Exercise 3

Divide the following using repeated subtraction method:

1. 100 ÷ 20 =
2. 40 ÷ 10 =
3. 33 ÷ 11=
4. 60 ÷ 15 =
5. 36 ÷ 6 =
6. 49 ÷ 7 =
7. 18 ÷ 6 =
8. 15 ÷ 3 =
9. 24 ÷ 4 =
10. 54 ÷ 9 =

The following examples show steps used when dividing numbers:

Example 1

68 ÷ 2 = 34

When dividing numbers, start to divide the numbers from left to right.

Steps

1. Divide 6 tens by 2 to get 3 tens. Write 3 in the answer position.
2. Divide 8 ones by 2 to get 4 ones. Write 4 in the answer position on the right of 3.

Therefore, the answer is 34.

Example 2

When dividing numbers, start to divide the numbers from left to right.

245 ÷ 5 = 49

Steps

1. Divide 2 by 5, it is not sufficient.

2. Combine 2 with the next digit to form 24. Now, divide 24 by 5 to get 4 and the remainder is 4. Write 4 in the answer position.

3. Combine the remainder 4 and 5 to form 45. Divide 45 by 5 to get 9. Write 9 in answer to the right of 4 to get 49.

   Therefore, the answer is 49.

Exercise 4

Answer the following questions:

1. 88 ÷ 8 =	**2.** 64 ÷ 4 =	**3.** 48 ÷ 3 =
4. 70 ÷ 7 =	**5.** 36 ÷ 6 =	**6.** 54 ÷ 3 =
7. 72 ÷ 3 =	**8.** 86 ÷ 2 =	**9.** 96 ÷ 6 =
10. 156 ÷ 4 =	**11.** 272 ÷ 8 =	**12.** 981 ÷ 3 =
13. 225 ÷ 5 =	**14.** 196 ÷ 4 =	**15.** 175 ÷ 5 =
16. 125 ÷ 5 =	**17.** 99 ÷ 9 =	**18.** 87 ÷ 3 =
19. 444 ÷ 4 =	**20.** 84 ÷ 4 =	**21.** 100 ÷ 5 =

Division of numbers by short method

Example 1

$2\overline{)284}$

Steps

1. Divide 2 hundreds by 2 to get 1 hundreds. Write 1 in the answer position.

$$\begin{array}{r} 1 \\ 2\overline{)284} \end{array}$$

2.	Divide 8 tens by 2 to get 4 tens. Write 4 in the answer position on the right of 1.	$2\overline{)284}$ 12
3.	Divide 4 ones by 2 to get 2 ones. Write 2 in the answer position on the right of 4.	$2\overline{)284}$ 142
	Therefore, the answer is 142.	

Example 2

$8\overline{)240}$

Steps

1.	Divide 2 hundreds by 8, it is not sufficient;	$8\overline{)240}$
2.	2 hundreds = 20 tens. Add tens; 20 + 4 = 24. Divide 24 tens by 8 to get 3. Write 3 in the answer position.	$8\overline{)240}$ 3
3.	Divide 0 by 8 to get 0. Write 0 in the answer position on the right of 3.	$8\overline{)240}$ 30
	Therefore, the answer is 30.	

Example 3

$12\overline{)384}$

Steps

1.	Divide 3 by12, not sufficient.	$12\overline{)384}$
2.	Combine 3 and 8 to get 38. Divide 38 by 12 to get 3, and the remainder is 2. Write 3 in the answer position.	2 $12\overline{)384}$ 3

3. Take the remainder and combine it with the next digit to form 24. Divide 24 by 12 to get 2. Write 2 to the right of 3 to get 32.

$$\begin{array}{r} 24 \\ 12\overline{)384} \\ 32 \end{array}$$

Therefore, the answer is 32.

Exercise 5

Answer the following questions:

1. $2\overline{)64}$	**2.** $3\overline{)93}$	**3.** $9\overline{)999}$
4. $4\overline{)840}$	**5.** $6\overline{)660}$	**6.** $18\overline{)360}$
7. $8\overline{)168}$	**8.** $20\overline{)400}$	**9.** $7\overline{)217}$
10. $95\overline{)950}$	**11.** $4\overline{)64}$	**12.** $2\overline{)744}$
13. $12\overline{)264}$	**14.** $31\overline{)961}$	**15.** $75\overline{)825}$
16. $56\overline{)840}$	**17.** $8\overline{)960}$	**18.** $12\overline{)780}$
19. $21\overline{)735}$	**20.** $14\overline{)294}$	**21.** $41\overline{)574}$
22. $32\overline{)544}$	**23.** $56\overline{)672}$	**24.** $27\overline{)567}$
25. $18\overline{)396}$	**26.** $11\overline{)253}$	**27.** $5\overline{)170}$

28. $17\overline{)918}$	**29.** $14\overline{)308}$	**30.** $19\overline{)285}$
31. $24\overline{)216}$	**32.** $10\overline{)880}$	**33.** $11\overline{)451}$
34. $12\overline{)492}$	**35.** $34\overline{)408}$	**36.** $26\overline{)624}$
37. $23\overline{)322}$	**38.** $15\overline{)465}$	**39.** $17\overline{)289}$
40. $81\overline{)972}$	**41.** $99\overline{)297}$	**42.** $67\overline{)536}$

Division of numbers by long method

Example 1

$2\overline{)68}$

Steps

1.	Divide 6 by 2, to get 3. Write 3 in the answer position.	$2\overline{)68}$ → 3
2.	Multiply; 3 × 2 = 6. Write 6 below 6 and then subtract to get 0.	6 − 6 = 0
3.	Take down 8 and then divide it by 2 to get 4.	8
4.	Write 4 at the answer position on the right of 3. Multiply; 4 × 2 = 8. Write 8 and subtract; 8 – 8 = 0. You will get 0.	8 − 8 = 0
	Therefore, the answer is 34.	

$$\begin{array}{r} 34 \\ 2\overline{)68} \\ -6\downarrow \\ \hline 8 \\ -8 \\ \hline 0 \\ \hline \end{array}$$

Example 2

$5\overline{)245}$

Steps

1. Divide 2 by 5; it is not sufficient. Start with two digits; 24. Think a number when multiplied by 5 the answer is 24 or slightly less than 24.

   Trials: 5 × 4 = 20; 20 is less than 24

   5 × 5 = 25; 25 is greater than 24.

   So the right number is 4.

   Write 4 on the answer position and 20 below 24.

   Subtract 20 from 24 to get 4;
   Take down 5 to form 45.

2. Think of a number when multiplied by 5 the answer is 45 or slightly less than 45.

   Trials: 5 × 9 = 45. So 9 is the right number. Write 9 on the answer position at the right of 4 and 45 below 45.

3. Subtract; 45 – 45 = 0.

   Therefore, the answer is 49.

```
    49
5 ) 245
  – 20↓
  ----
    45
  – 45
  ----
    00
```

Example 3

$8\overline{)808}$

Steps

1. Divide 8 by 8 to get 1. Write 1 to the answer position. Multiply; 1 × 8 = 8, write 8 below 8 and then subtract to get 0.
2. Take down 0 and then divide it by 8 to get 0. Write 0 at the answer position at the right of 1. Multiply; 0 × 8 = 0. Write 0 below 0 and subtract to get 0. Take down 8 and divide it by 8 to get 1.
3. Write 1 at the answer position on the right of 0. Multiply; 1 × 8 = 8. Write 8 below 8 and subtract to get 0.

   Therefore, the answer is 101.

```
   101
8 ) 808
  - 8↓
  ---
    0
  - 0
  ---
    8
  - 8
  ---
    0
```

Exercise 6

Answer the following questions:

1.	$2\overline{)86}$	**2.**	$5\overline{)55}$	**3.**	$4\overline{)88}$
4.	$3\overline{)723}$	**5.**	$7\overline{)532}$	**6.**	$4\overline{)600}$
7.	$5\overline{)900}$	**8.**	$3\overline{)351}$	**9.**	$6\overline{)660}$
10.	$7\overline{)189}$	**11.**	$4\overline{)184}$	**12.**	$8\overline{)736}$

13.	$9\overline{)126}$	**14.**	$3\overline{)783}$	**15.**	$5\overline{)700}$
16.	$8\overline{)824}$	**17.**	$7\overline{)665}$	**18.**	$7\overline{)847}$
19.	$9\overline{)765}$	**20.**	$6\overline{)228}$	**21.**	$5\overline{)655}$
22.	$3\overline{)495}$	**23.**	$6\overline{)114}$	**24.**	$4\overline{)576}$

Division of numbers by divisors with two digits

Example 1

$11\overline{)451}$

Steps

1.	Since 4 is not divisible by 11, you start with 45.	41 11) 451
2.	11 × 4 = 44. Write 4 at the answer position and 44 below 45. Subtract; 45 – 44 = 1.	- 44 ↓ 11
3.	Take down 1 to get 11.	- 11 00
4.	11 × 1 = 11. Write 1 at the answer position and 11 below 11. Subtract; 11–11= 0. Therefore, the answer is 41.	

Example 2

$18\overline{)684}$

Steps

1.	Since 6 is not divisible by 18, you start with 68.	$18\overline{)\begin{array}{r}38\\684\\-\ 54\downarrow\\\hline 144\\-\ 144\\\hline 000\end{array}}$
2.	18 × 3 = 54. Write 3 at the answer position and 54 below 68. Subtract; 68 – 54 = 14.	
3.	Take down 4 to get 144.	
4.	18 × 8 = 144. Write 8 at the answer position on the right of 3 and 144 below 144. Subtract; 144 – 144 = 0. Therefore, the answer is 38.	

Exercise 7

Answer the following questions:

1. $84\overline{)924}$	2. $13\overline{)169}$	3. $12\overline{)192}$
4. $17\overline{)663}$	5. $23\overline{)575}$	6. $50\overline{)600}$
7. $15\overline{)900}$	8. $13\overline{)351}$	9. $25\overline{)525}$
10. $23\overline{)552}$	11. $32\overline{)768}$	12. $17\overline{)714}$
13. $14\overline{)552}$	14. $34\overline{)782}$	15. $25\overline{)700}$

16. $16\overline{)288}$ 17. $27\overline{)675}$ 18. $22\overline{)418}$

19. $31\overline{)775}$ 20. $16\overline{)320}$ 21. $15\overline{)375}$

22. $33\overline{)495}$ 23. $17\overline{)374}$ 24. $24\overline{)600}$

Word problems involving division

Example 1

A poetry book has 156 pages. If Baraka can read 12 pages every day, how many days does he need to read the entire book?

Solution

Total number of pages in the book = 156

Number of pages Baraka reads everyday = 12

Divide 156 pages by 12 to get the required number of days.

Dividing using the short method:

$$12\overline{)156}$$
$$13$$

Baraka can read the book in 13 days.

Example 2

If 984 oranges are equally divided to 24 pupils, how many oranges will each pupil get?

Solution

Total number of oranges = 984

Total number of pupils = 24

Divide 984 by 24 using the long method to get the number of oranges.

$$
\begin{array}{r}
41 \\
24\overline{)\,984} \\
-\,96\downarrow \\
\hline
24 \\
-\,24 \\
\hline
00
\end{array}
$$

Therefore, each pupil will get 41 oranges.

Exercise 8

Answer the following questions:

1. A baker got 800 shillings after selling 8 loaves of bread. What was the price of one loaf of bread??
2. Maganga's mother sold 6 eggs for 2400 shillings. How much money did each egg cost?
3. There are 560 soft drink bottles in 14 crates. If the crates have equal number of bottles, how many bottles are in each crate?

4. A train carried 579 passengers in 3 trips. If the number of passengers in each trip was equal, how many passengers were carried in each trip?
5. If 15 writing pads of the same size have a total of 195 lines, how many lines are in each pad?
6. Majengo Primary School has 897 pupils in 23 streams. If the streams have an equal number of pupils, how many pupils are in each stream?
7. If a box can keep 25 bars of soap, how many boxes are needed to keep 900 bars of soap?
8. The price of 11 sweets is 440 shillings. What is the price of one sweet?
9. If 19 lorries of the same type have a total of 114 tyres, what is the number of tyres in each lorry?
10. A rope of 300 centimetres long was divided into 10 equal parts. What is the length of each part?

Summary

1. When dividing objects, divide them one by one in rounds.
2. Dividing numbers is the same as subtracting numbers repeatedly.

Chapter Eight

Fractions

Introduction

In Standard Three, you learnt how to read and write fractions which have two digits. In this chapter, you will learn addition and subtraction of fractions with the same denominator. This knowledge will help you in reading time, selling and buying things and other daily activities.

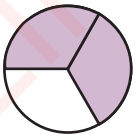
Exercise 1: Revision

1. Write the following fractions in numerals:

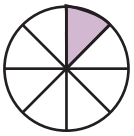
(a) Three quarters
(b) Two thirds
(c) Half
(d) Two sixths
(e) One sixth.

2. Write the fraction of the shaded parts in each of the following figures:

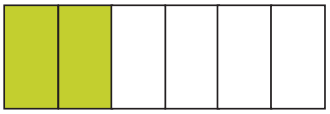
(a) 

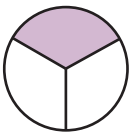
(b) 

(c) 

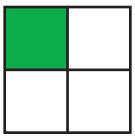
(d) 

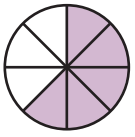
(e) 

(f) 

(g) 

(h) 

(i) 

(j) 

Addition of fractions with the same denominator

Example 1

Use drawings to answer the following question.

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

Steps

1. Draw two circles of equal size.
2. Divide the two circles into four equal parts.
3. Shade 3 parts out of 4 in the first circle.
4. Write in numerals the fraction of the shaded part in the first circle.
5. Shade 1 part out of 4 in the second circle.
6. Write in numeral the fraction of the shaded part in the second circle.
7. Add the fractions of the shaded parts in the two circles.
8. Draw the third circle to show your answer.

The required fraction is represented in the following figures:

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

Therefore, to add fractions with the same denominator, add the numerators. The denominator remains the same.

Therefore, $\frac{3}{4} + \frac{1}{4} = \frac{3+1}{4} = \frac{4}{4}$.

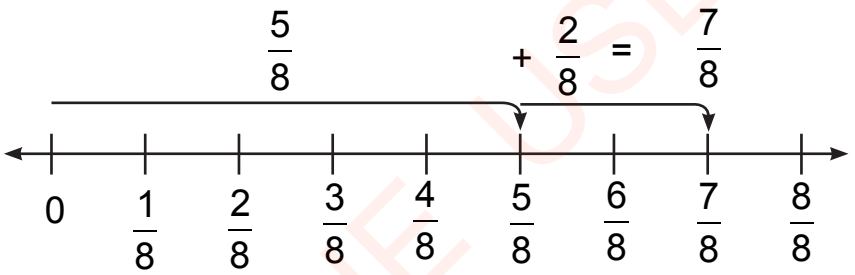
Example 2

Use a number line to find the answer of the following question.

$$\frac{5}{8}+\frac{2}{8}=$$

Steps

1. Draw a line and divide it into 8 equal parts.
2. Mark the parts.
3. From 0, the first mark is one eighth, $\frac{1}{8}$.
4. From 0 the fifth mark is five eighth, $\frac{5}{8}$.
5. Add $\frac{2}{8}$ to $\frac{5}{8}$. This means that from $\frac{5}{8}$ you move 2 steps to the right and read the last mark.



Therefore, $\frac{5}{8}+\frac{2}{8}=\frac{5+2}{8}=\frac{7}{8}$.

Example 3

$$\frac{13}{27}+\frac{7}{27}=$$

Steps

1. Add the numerators in the same way as you add the whole numbers.
2. Keep denominator the same.
3. Therefore, $\frac{13}{27}+\frac{7}{27}=\frac{13+7}{27}=\frac{20}{27}$.

Exercise 2

Answer the following questions:

1. $\frac{2}{5} + \frac{2}{5} =$
2. $\frac{3}{9} + \frac{5}{9} =$
3. $\frac{1}{4} + \frac{1}{4} =$
4. $\frac{3}{6} + \frac{2}{6} =$
5. $\frac{1}{5} + \frac{2}{5} =$
6. $\frac{5}{8} + \frac{1}{8} =$
7. $\frac{3}{10} + \frac{5}{10} =$
8. $\frac{1}{7} + \frac{5}{7} =$
9. $\frac{1}{2} + \frac{1}{2} =$
10. $\frac{2}{6} + \frac{4}{6} =$
11. $\frac{1}{4} + \frac{2}{4} =$
12. $\frac{1}{15} + \frac{1}{15} =$
13. $\frac{3}{9} + \frac{4}{9} =$
14. $\frac{3}{7} + \frac{3}{7} =$
15. $\frac{0}{5} + \frac{2}{5} =$
16. $\frac{1}{3} + \frac{1}{3} =$
17. $\frac{2}{7} + \frac{4}{7} =$
18. $\frac{11}{20} + \frac{7}{20} =$
19. $\frac{1}{10} + \frac{3}{10} =$
20. $\frac{16}{35} + \frac{9}{35} =$

Exercise 3

Answer the following questions:

1. $\frac{3}{25} + \frac{4}{25} =$
2. $\frac{6}{20} + \frac{11}{20} =$
3. $\frac{8}{18} + \frac{9}{18} =$
4. $\frac{4}{16} + \frac{5}{16} =$
5. $\frac{4}{11} + \frac{6}{11} =$
6. $\frac{9}{100} + \frac{89}{100} =$
7. $\frac{9}{15} + \frac{2}{15} =$
8. $\frac{8}{9} + \frac{1}{9} =$
9. $\frac{4}{10} + \frac{5}{10} =$
10. $\frac{13}{50} + \frac{30}{50} =$

Word problems on addition of fractions

Example

If $\frac{3}{9}$ of a water tank was filled by Yona and $\frac{2}{9}$ of the tank was filled by Halima, what fraction of the tank was filled by both Yona and Halima?

Solution

Add the two fractions to get the total. That is,

$$\frac{3}{9} + \frac{2}{9} = \frac{3+2}{9} = \frac{5}{9}$$

Therefore, Yona and Asha filled $\frac{5}{9}$ of the tank with water.

Exercise 4

Answer the following questions:

1. Mother gave her daughter a quarter of a packet of biscuits. Later she gave her daughter three quarters of that packet of biscuits. What is the total fraction of the packet of biscuits did she ate?

2. Masanja ate $\frac{1}{6}$ of the bread and Amani ate $\frac{2}{6}$ of the same bread. What fraction of the bread did they eat both of them?

3. A farmer divided his farm into 8 equal plots. He planted maize in $\frac{4}{8}$ of his plots and beans in $\frac{3}{8}$ of the plots. What fraction of the farm was planted with maize and beans?

4. A villager sold $\frac{2}{5}$ of his cotton at Mlole Co-operative Union and $\frac{3}{5}$ at Mwadui Co-operative Union. What fraction of cotton did the farmer sell at the two co-operative unions?

5. Tausi spent $\frac{1}{7}$ of her salary for rent and $\frac{3}{7}$ for food. What fraction of her salary did she spend on both rent and food?

6. Maunda bought two fishes. The first fish weighed $\frac{2}{4}$ kilogram and the second fish weighed $\frac{2}{4}$ kilogram. What is the total mass of the two fishes?

7. Maendeleo village planned to build a health centre. The villagers made $\frac{5}{10}$ of the required bricks. If the chairperson contributed $\frac{3}{10}$ of the required bricks, what fraction of the required bricks did the village get?

8. Nuru sold $\frac{3}{10}$ of the total mangoes to the first customer and $\frac{6}{10}$ of the mangoes to the second customer. What fraction of mangoes was sold to the two customers?

9. A school bought books for several subjects. If $\frac{4}{12}$ of the books were Mathematics books, $\frac{2}{12}$ were Kiswahili books, and $\frac{3}{12}$ were Science and Technology books, what fraction of the books was bought for the three subjects?

10. Draw a figure and shade the fraction which shows:

$\frac{3}{7} + \frac{2}{7} = \frac{5}{7}$.

Subtraction of fractions with the same denominator

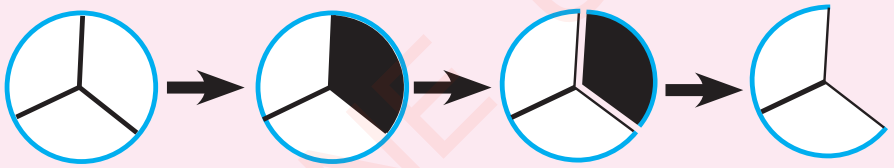
Example 1

Use drawings to find the correct answer.

$$\frac{3}{3} - \frac{1}{3} =$$

Steps

1. Draw one circle.
2. Divide the circle into 3 equal parts and then represent each part as a fraction.
3. Shade one part of the circle out of the three part of the circle.
4. Write the shaded part in fraction.
5. Remove the shaded part from the circle.
6. Draw the remaining parts of the circle.
7. Write the remaining part of the circle in fraction.



$\frac{3}{3}$ $\frac{1}{3}$ $\frac{3}{3} - \frac{1}{3}$ is equal to $\frac{2}{3}$

Therefore, $\frac{3}{3} - \frac{1}{3} = \frac{2}{3}$.

To subtract fractions using drawings means to remove the shaded parts in the drawing.

Therefore, subtraction of fractions with the same denominator is done by subtracting the numerators.The denominator remains the same, because it is representing parts of the whole object. That is, $\frac{3}{3} - \frac{1}{3} = \frac{3-1}{3} = \frac{2}{3}$.

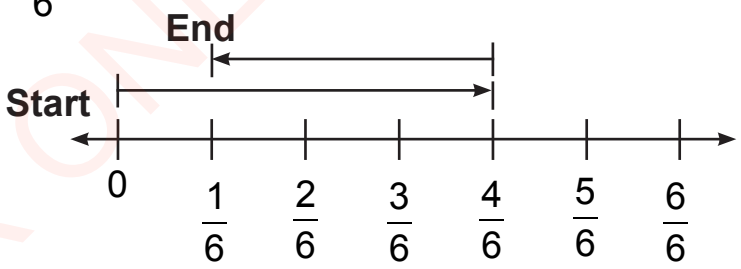
Example 2

Use a number line to find the answer the following question.

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

Steps

1. Draw a line.
2. Divide the line into 6 equal parts.
3. Counting from 0, the first mark represents 1 out of 6 equal parts. This is one sixth, $\frac{1}{6}$.
4. Starting from 0, move 4 steps to the right. You will arrive at $\frac{4}{6}$.
5. From the end mark in step 4, move 3 steps to the left. You will arrive at $\frac{1}{6}$.
6. Read the answer at the end of step 5. You will get $\frac{1}{6}$.



Therefore, $\frac{4}{6} - \frac{3}{6} = \frac{4-3}{6} = \frac{1}{6}$.

Example 3

Find the correct answer.

$$\frac{11}{12} - \frac{7}{12} =$$

Steps

1. Subtract numerators the same way as you subtract whole numbers.
2. Therefore, $\frac{11}{12} - \frac{7}{12} = \frac{11-7}{12} = \frac{4}{12}$.

Exercise 5

Answer the following questions:

1. $\frac{5}{8} - \frac{3}{8} =$
2. $\frac{2}{5} - \frac{1}{5} =$
3. $\frac{4}{9} - \frac{1}{9} =$
4. $\frac{6}{7} - \frac{4}{7} =$
5. $\frac{2}{3} - \frac{1}{3} =$
6. $\frac{3}{3} - \frac{1}{3} =$
7. $\frac{3}{6} - \frac{1}{6} =$
8. $\frac{7}{8} - \frac{5}{8} =$
9. $\frac{6}{13} - \frac{3}{13} =$
10. $\frac{3}{5} - \frac{2}{5} =$
11. $\frac{4}{5} - \frac{1}{5} =$
12. $\frac{5}{7} - \frac{3}{7} =$
13. $\frac{2}{6} - \frac{2}{6} =$
14. $\frac{2}{2} - \frac{1}{2} =$
15. $\frac{5}{10} - \frac{1}{10} =$
16. $\frac{4}{4} - \frac{2}{4} =$
17. $\frac{5}{11} - \frac{1}{11} =$
18. $\frac{16}{50} - \frac{5}{50} =$

19. $\frac{24}{25} - \frac{20}{25} =$ 20. $\frac{75}{100} - \frac{50}{100} =$ 21. $\frac{35}{40} - \frac{35}{40} =$

22. $\frac{41}{75} - \frac{23}{75} =$ 23. $\frac{17}{20} - \frac{9}{20} =$ 24. $\frac{75}{100} - \frac{25}{100} =$

Exercise 6

Answer the following questions:

1. $\frac{7}{9} - \frac{3}{9} =$ 2. $\frac{3}{5} - \frac{1}{5} =$ 3. $\frac{8}{9} - \frac{1}{9} =$

4. $\frac{74}{100} - \frac{30}{100} =$ 5. $\frac{32}{83} - \frac{27}{83} =$ 6. $\frac{45}{100} - \frac{10}{100} =$

7. $\frac{17}{20} - \frac{16}{20} =$ 8. $\frac{16}{16} - \frac{7}{16} =$ 9. $\frac{17}{25} - \frac{12}{25} =$

10. $\frac{15}{25} - \frac{8}{25} =$ 11. $\frac{13}{15} - \frac{2}{15} =$ 12. $\frac{9}{11} - \frac{5}{11} =$

13. $\frac{6}{7} - \frac{2}{7} =$ 14. $\frac{27}{49} - \frac{19}{49} =$ 15. $\frac{65}{70} - \frac{50}{70} =$

16. $\frac{35}{40} - \frac{15}{40} =$ 17. $\frac{41}{75} - \frac{23}{75} =$ 18. $\frac{17}{20} - \frac{9}{20} =$

19. $\frac{70}{100} - \frac{20}{100} =$ 20. $\frac{24}{40} - \frac{20}{40} =$

Word problems on subtraction of fractions

Example

Five eighth of a farm is planted mango trees. The remaining fraction of the farm is planted orange trees. What fraction of the farm is planted orange trees?

Steps

1. The farm can be divided into 8 equal parts. A whole farm is the same as eight eighth, which is equal to $\frac{8}{8}$.
2. The fraction of planted mango trees $= \frac{5}{8}$.
3. Subtract $\frac{5}{8}$ from $\frac{8}{8}$ to get the fraction of the farm which is planted orange trees. That is,

$$\frac{8}{8} - \frac{5}{8} = \frac{8-5}{8} = \frac{3}{8}$$

Therefore, the fraction of the farm which is planted orange trees is $\frac{3}{8}$.

Exercise 7

Answer the following questions:

1. Half of Ngosha's farm is cultivated. What fraction of his farm is not cultivated?
2. A quarter of oranges harvested by Aisha were rotten. What fraction of the oranges was not rotten?
3. Bahati cut a watermelon into 10 equal pieces. If $\frac{7}{10}$ of the watermelon was sold, what fraction was not sold?

4. Mariam ate one-sixths of a whole sugarcane. What fraction of the sugarcane remained?

5. Kandi had $\frac{5}{9}$ of a whole loaf of bread. If he gave Godfrey $\frac{4}{9}$ of the bread, what fraction did he remain with?

6. Kabula did $\frac{7}{12}$ of Mathematics homework questions in the morning and $\frac{2}{12}$ of the questions in the evening. What fraction of the questions remained?

7. Draw a figure to show: $\frac{4}{5} - \frac{1}{5} = \frac{3}{5}$.

8. Three quarters of Hamisi's farm is bordered by the main road. What fraction of the farm is not bordered by the main road?

9. Bakari spends $\frac{1}{10}$ of his salary to pay for house rent and $\frac{2}{10}$ of the salary to pay for water and electricity bills. What fraction of Bakari's salary remains after paying house rent, water and electricity bills?

10. Villagers sowed seeds of fruit plants. If $\frac{2}{7}$ of the seeds did not germinate, what fraction of the seeds germinated?

Summary

1. A fraction has the form $\frac{A}{B}$, whereby A is a numerator and B is a denominator.
2. To add or subtract fractions of the same denominators, the denominator does not change.

Chapter Nine

Time

Introduction

In Standard Three, you learnt the relationship between an hour, a day, a week, a month and a year. In this chapter, you will learn reading, writing, adding and subtracting time in hours and minutes. Also you will solve word problems involving time. This knowledge will help you prepare your own timetables, know the starting and finishing of an event and follow your daily school routine properly.

Exercise 1: Revision

1. Compare the units of time and fill in the blanks of the following table:

Time	Measure
3 days	___ hour
2 weeks	___ days
3 hours	___ minutes
2 leap years	___ months
1 leap year	___ days
2 ordinary years	___ months
1 ordinary year	___ days

2. List down the names of all months of the year.

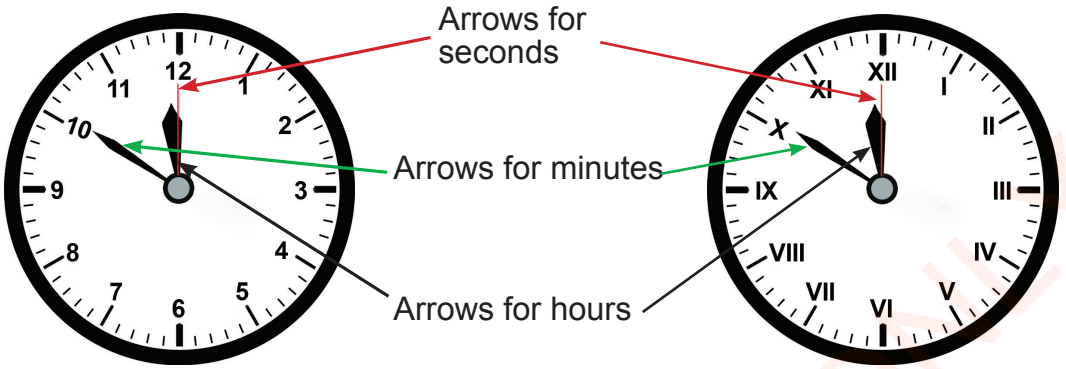
3. How many days are in February in an ordinary year?

4. How many days are in February in a leap year?

The clock face

The clock face has three arrows. The arrows are fixed at the centre of the clock face.

The short and thick arrow shows hours. The long arrow shows minutes. The longest and thin arrow shows seconds. Time in the clock face can be shown using numerals or Roman numbers.



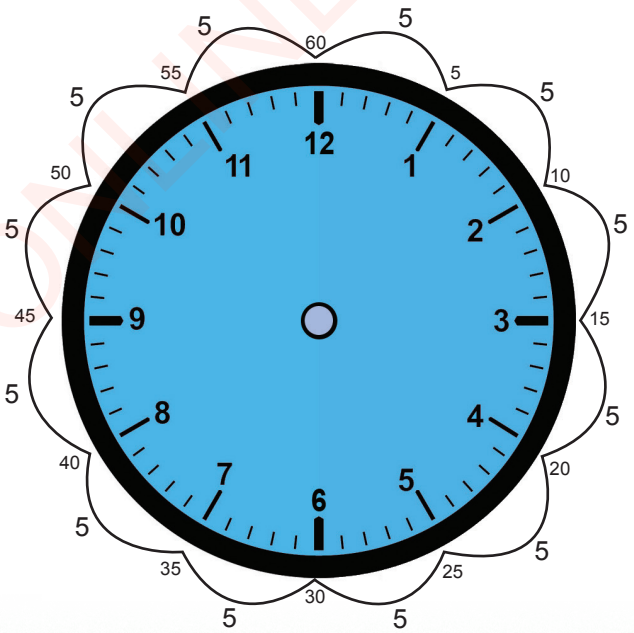
A clock using numerals

A clock using Roman numbers

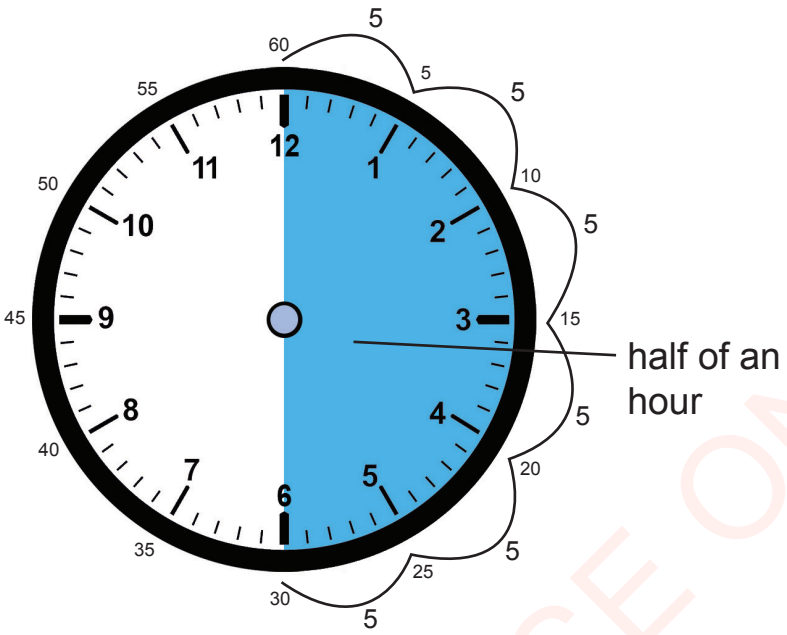
All arrows rotate on the clock face from left to right. The hour arrow covers 12 hours in one complete rotation.

1 hour is equal to sixty (60) minutes.

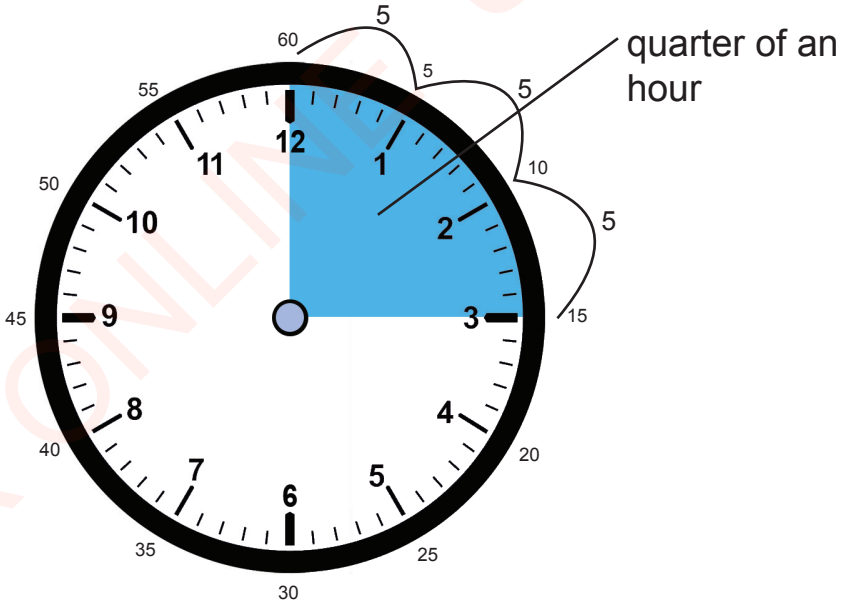
This means that the minute hand completes a full circle.



Thirty (30) minutes are equal to a half of an hour.



Fifteen (15) minutes are equal to a quarter of an hour.

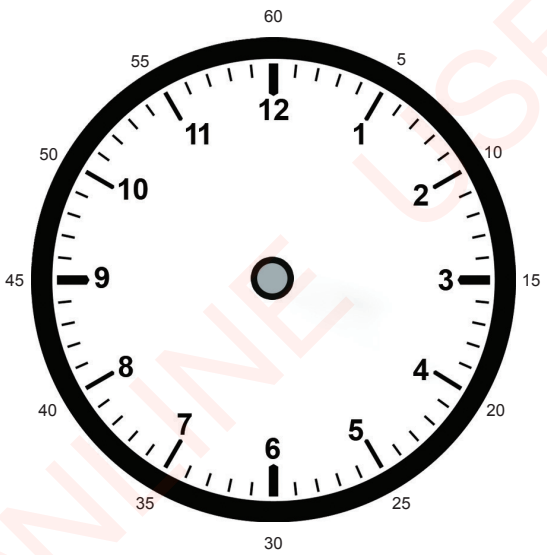


Drawing a clock face

Activity

Steps

1. Prepare a circular object such as a 200 Tanzanian shilling coin, 500 Tanzanian shilling coin or a plastic bottle cap.
2. Use the circular object and a pencil to draw a circle on a paper.
3. Divide the circle into 12 equal parts. Put twelve thick mark on the circle as a clock face.



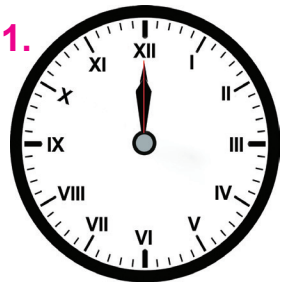
4. Write 1, 2, 3, …, 12 facing the thick marks.
5. Draw a short and thick arrow facing number 4 from the centre of the circle.
6. Draw a long arrow facing number 12 from the centre of the circle.
7. Read and record the time you have indicated.

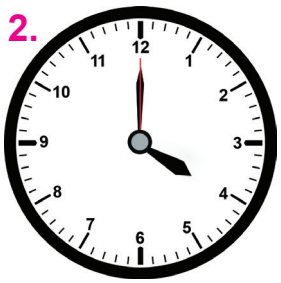
Reading and writing time by using clock

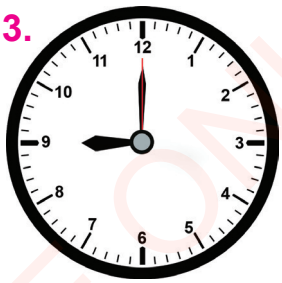
Reading time by using clock

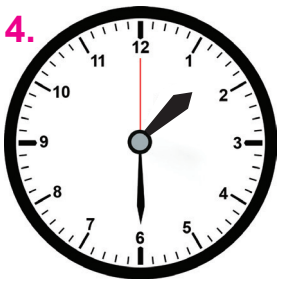
Example

Read time in the following clocks:

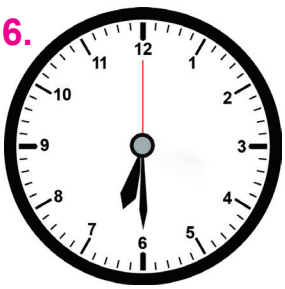
1. 
12 O'clock
(12:00)

2. 
4 O'clock
(4:00)

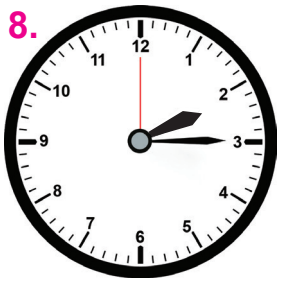
3. 
9 O'clock
(9:00)

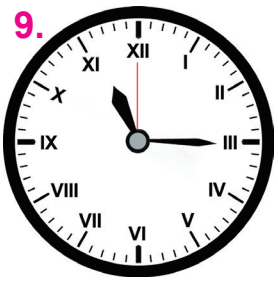
4. 
Half past one
(1:30)

5. 
Half past eight
(8:30)

6. 
Half past six
(6:30)

7. 
Quarter past five
(5:15)

8. 
Quarter past two
(2:15)

9. 
Quarter past eleven
(11:15)

Writing time in hours and minutes

When writting time from a clock, start to write hours followed by minutes.

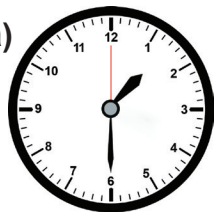
Example

1. Six O'clock is written as 6:00.
2. Thirty minutes past twelve is written as 12:30.
3. A quarter past ten is written as 10:15.

Exercise 2

Answer the following questions:

1. Read the following clocks then write the time in words and in numerals.

(a) 

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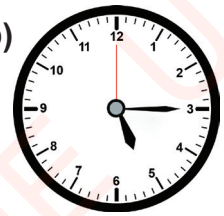
(b) 

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(c) 

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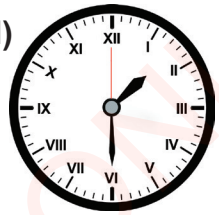
(d) 

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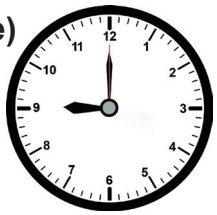
(e) 

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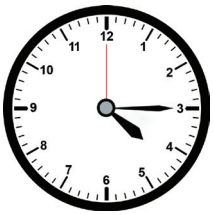
(f) 

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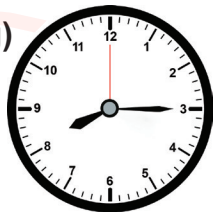
(g) 

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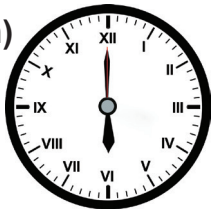
(h) 

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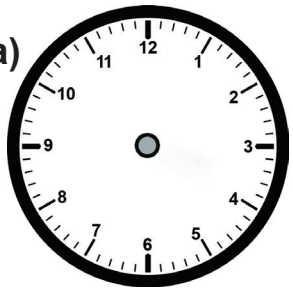
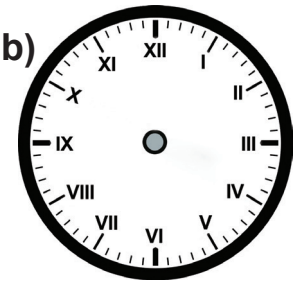
2. Draw arrows for hours and minutes to show each of the indicated time:

(a)



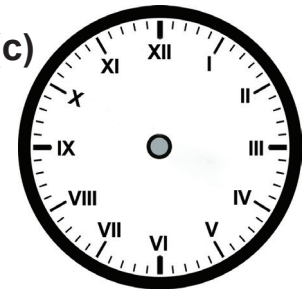
3 O'clock
(3:00)

(b)



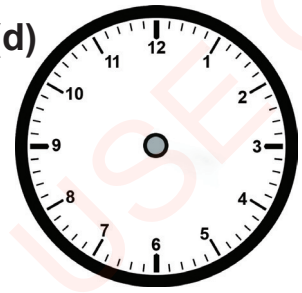
Half past eight
(8:30)

(c)



6 O'clock
(6:00)

(d)



A quarter past nine
(9:15)

3. Write the following time in words:

(a) 12:15 _____

(b) 1:00 _____

(c) 11:30 _____

(d) 2:00 _____

(e) 8:15 _____

(f) 2:30 _____

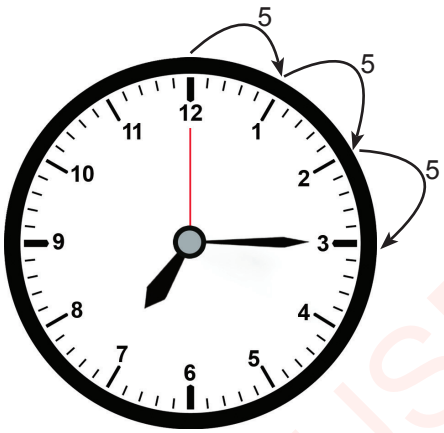
(g) 10:15 _____

(h) 5:00 _____

Time in hours and minutes

When reading time in English, we normally start with minutes followed by hours.

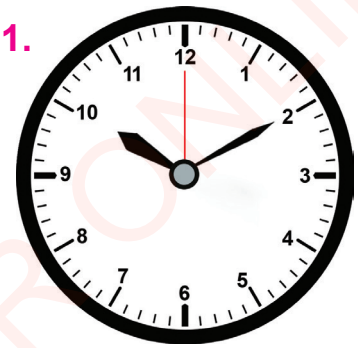
Example



It is fifteen minutes past seven or a quarter past seven (7:15).

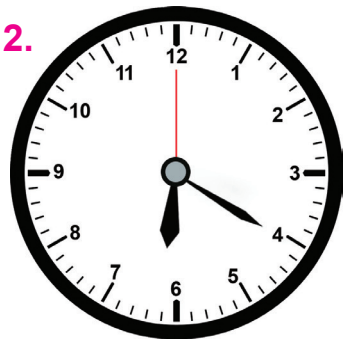
Read the time indicated in each of the following clocks:

1.



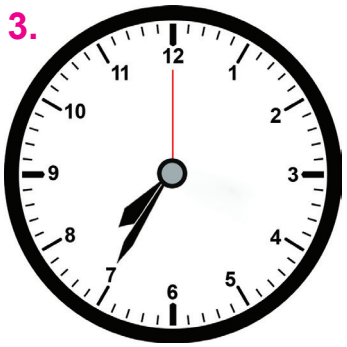
Ten minutes past ten
(10:10)

2.



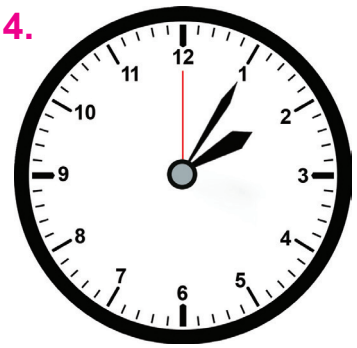
Twenty minutes past six
(6:20)

3.



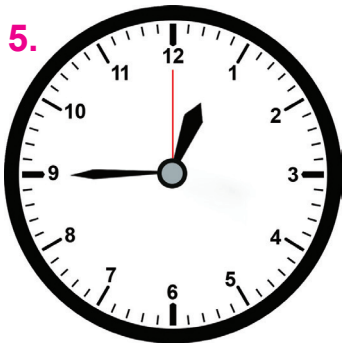
Thirty-five minutes past seven (7:35)

4.



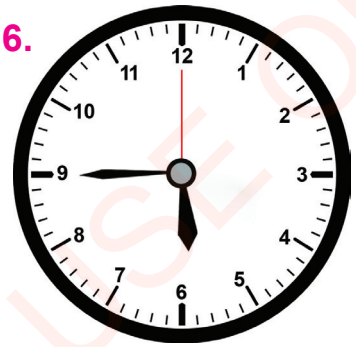
Five-minutes past two (2:05)

5.



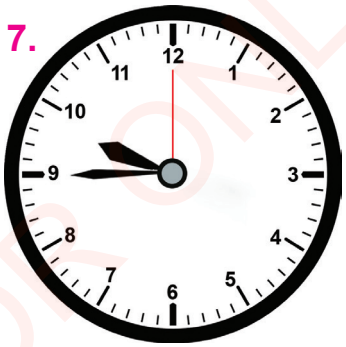
Forty-five minutes past twelve or fifteen minutes to one (12:45)

6.



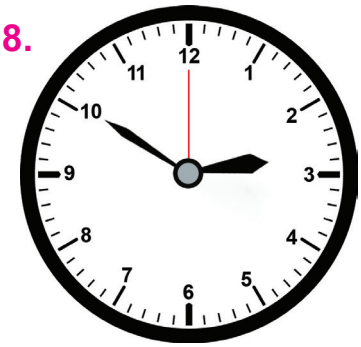
Forty-five minutes past five or fifteen minutes to six (5:45)

7.



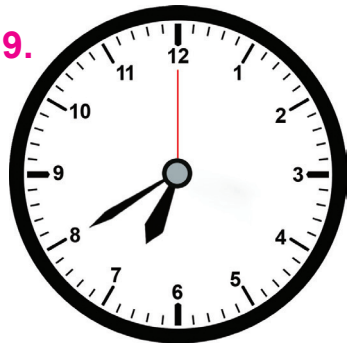
Forty-five minutes past nine or fifteen minutes to ten (9:45)

8.



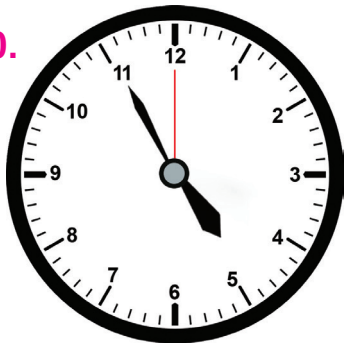
Fifty minutes past two or ten minutes to three (2:50)

9.



Forty minutes past six or twenty minutes to seven (6:40)

10.



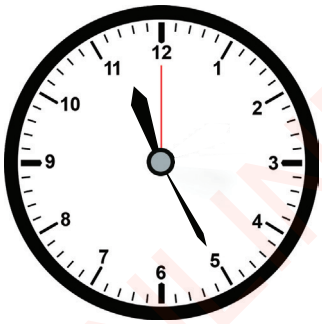
Fifty-five minutes past four or 5 minutes to five (4:55)

Exercise 3

Answer the following questions:

1. Read and write the following time in numerals and in words.

(a)



_____

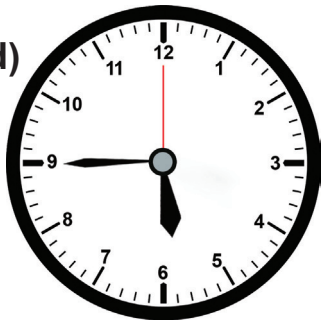
(b)

_____

(c)

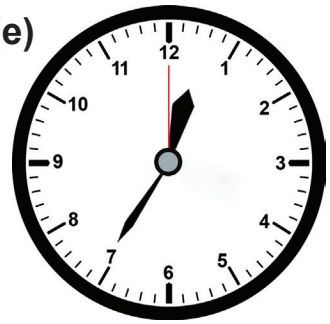
_____

(d)



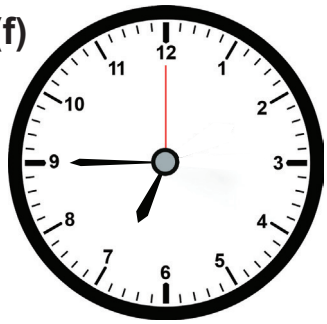
_____

(e)



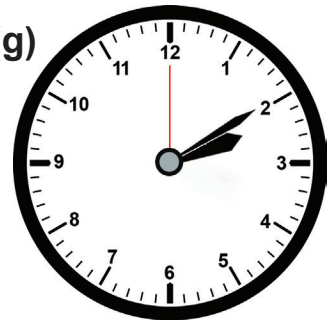
_____

(f)



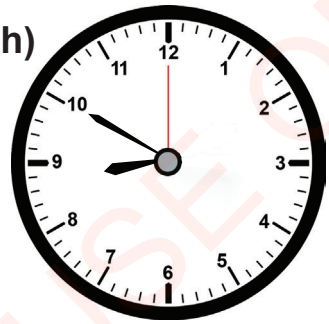
_____

(g)



_____

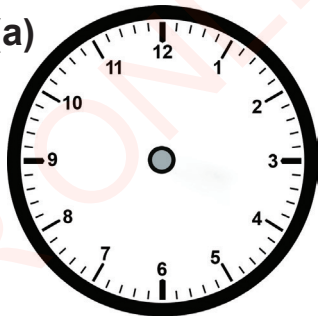
(h)



_____

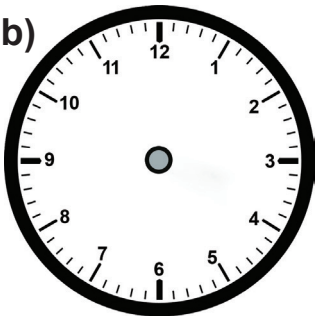
2. Draw arrows in clock face to show time which is indicated under each clock:

(a)



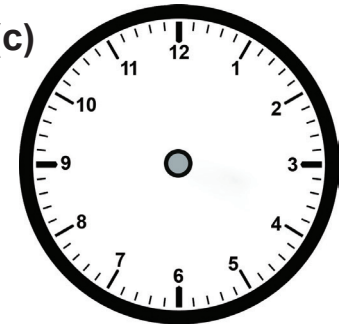
Five minutes past seven
(7:05)

(b)



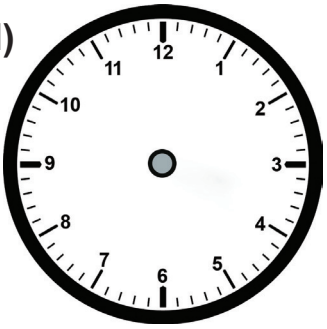
Thirty-five minutes past two
(2:35)

(c)



Fifty-five minutes past six
(6:55)

(d)



A quarter to three
(2:45)

3. Write each of the following time in words:

(a) 8:45 _____

(b) 12:10 _____

(c) 11:40 _____

(d) 2:25 _____

(e) 1:15 _____

(f) 4:35 _____

(g) 7:20 _____

(h) 5:05 _____

Exercise 4

Answer the following questions:

1. Write each of the following time in numerals:

(a) Half past seven _____

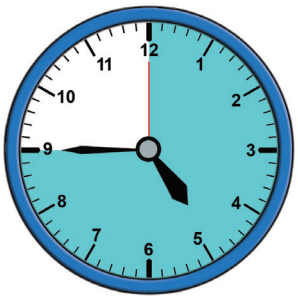
(b) Twenty-five minutes past ten _____

(c) Five O' clock _____

(d) A quarter to one _____

2. Write the time in words as indicated in each of the following clock faces:

(a)

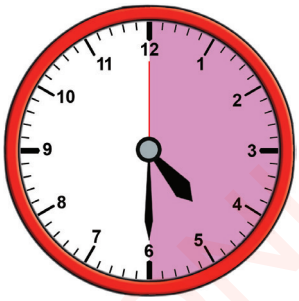


_____

(b)

_____

(c)

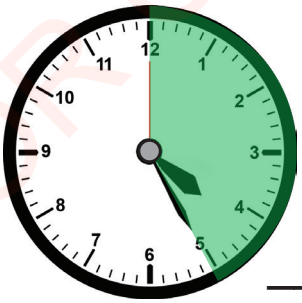


_____

(d)

_____

(e)

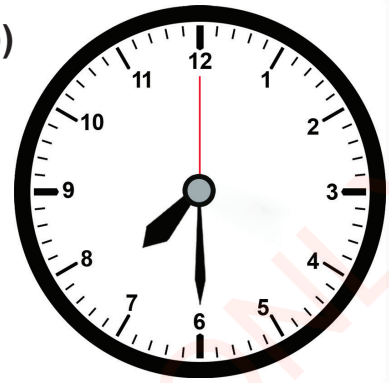


_____

3. Read and write the time shown in each of the following clock faces in numerals and in words.

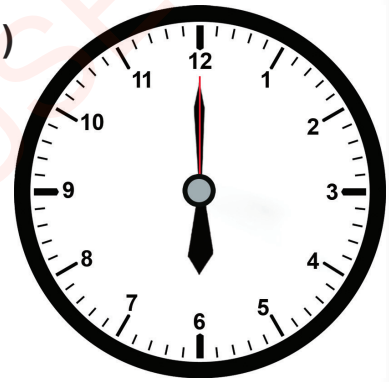
(a)

(b)



(c)

(d)



4. Draw clock faces to indicate each of the following time:

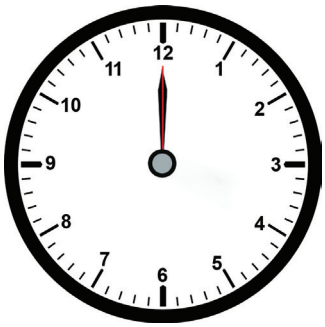
(a)	2:00	(b)	5:30	(c)	8:15
(d)	9:45	(e)	12:55	(f)	6:35

5. Draw clock faces to show each of the following time:

(a) Forty-five minutes past twelve.
(b) Thirty-five minutes past ten.
(c) A quarter past seven.
(d) A half past ten.
(e) Ten minutes to eleven.
(f) Four O'clock.
(g) Thirty minutes past six.

6. In each of the following clock faces, draw the missing arrows for the given time:

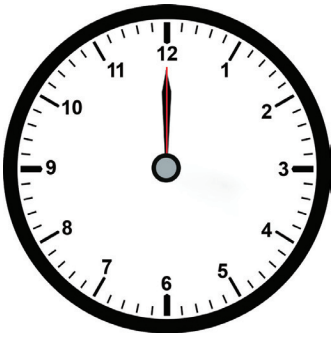
(a) Three O'clock



(b) Ten O'clock

(c) One O'clock

(d) Four O'clock



7. What is the difference between hour arrow and minute arrow?

Addition of time in hours and minutes

Adding time in hours and minutes without regrouping

I hour = 60 minutes.

Example 1

	hours	minutes
	2	25
+	3	15
	5	40

Steps

1. Add minutes: 25 + 15 = 40. Write 40 in the minutes column.

	hours	minutes
	2	25
+	3	15
		40

2. Add hours: 2 + 3 = 5. Write 5 in the hours column.

	hours	minutes
	2	25
+	3	15
	5	40

Therefore, the answer is 5 hours and 40 minutes.

Example 2

	hours	minutes
	4	30
+	5	28
	9	58

Exercise 5

Answer the following questions:

1.

hours	minutes
3	15
+ 4	25

2.

hours	minutes
2	15
+ 4	20

3.

hours	minutes
7	20
+ 1	35

4.

hours	minutes
2	30
+ 1	10

5.

hours	minutes
6	20
+ 2	30

6.

hours	minutes
8	10
+ 1	10

7.

hours	minutes
5	30
+ 1	15

8.

hours	minutes
5	00
+ 2	59

9.

hours	minutes
9	05
+ 2	30

10.

hours	minutes
3	15
+ 1	35

11.

hours	minutes
6	09
+ 1	15

12.

hours	minutes
4	12
+ 1	17

13.

hours	minutes
3	10
+ 2	40

14.

hours	minutes
1	22
+ 3	20

15.

hours	minutes
8	20
+ 1	30

Adding time in hours and minutes by regrouping

Example

	hours	minutes
	3^{+1}	45
+	4	35
	8	20

Steps

1. Add minutes; 45 + 35 = 80. Regroup 80 minutes into hours and minutes; 80 minutes = 60 minutes + 20 minutes = 1 hour + 20 minutes. Take 1 hour to the hours column and write 20 in the minutes column.

	hours	minutes
	1	
	3	45
+	4	35
		20

2. Add hours: 1 + 3 + 4 = 8. Write 8 in the hours column.

	hours	minutes
	1+	
	3	45
+	4	35
	8	20

Therefore, the answer is 8 hours and 20 minutes.

Exercise 6

Answer the following questions:

1.

hours	minutes
7	25
+ 2	55

2.

hours	minutes
1	37
+ 4	24

3.

hours	minutes
4	40
+ 3	50

4.

hours	minutes
2	20
+ 5	60

5.

hours	minutes
2	12
+ 1	49

6.

hours	minutes
9	15
+ 1	50

7.

hours	minutes
5	30
+ 1	45

8.

hours	minutes
4	01
+ 2	59

9.

hours	minutes
1	30
+ 2	30

10.

hours	minutes
3	15
+ 2	45

11.

hours	minutes
3	05
+ 8	55

12.

hours	minutes
4	12
+ 3	50

13.

hours	minutes
2	10
+ 3	54

14.

hours	minutes
8	20
+ 1	45

15.

hours	minutes
6	30
+ 2	40

Subtraction of time in hours and minutes

Subtracting time in hours and minutes without regrouping

Subtracting few minutes from many minutes is the same as subtracting whole numbers.

Example 1

	hours	minutes
	6	25
–	5	15
	1	10

Steps

1. Subtract minutes: 25 – 15 = 10. Write 10 in the minutes column.

hours	minutes
6	25
– 5	15
	10

2. Subtract hours: 6 – 5 = 1. Write 1 in the hours column.

hours	minutes
6	25
– 5	15
1	10

Therefore, the answer is 1 hour and 10 minutes.

Example 2

	hours	minutes
	8	37
–	3	22
	5	15

Exercise 7

Answer the following questions:

1.

hours	minutes
3	40
– 1	25

2.

hours	minutes
4	17
– 1	14

3.

hours	minutes
9	50
– 1	40

4.

hours	minutes
5	55
– 3	13

5.

hours	minutes
4	32
– 1	19

6.

hours	minutes
9	55
– 6	50

7.

hours	minutes
5	40
– 1	15

8.

hours	minutes
8	23
– 1	12

9.

hours	minutes
5	50
– 2	30

10.

hours	minutes
3	55
– 1	45

11.

hours	minutes
8	15
– 5	05

12.

hours	minutes
4	55
– 1	50

13.

hours	minutes
7	30
– 2	15

14.

hours	minutes
6	48
– 3	40

15.

hours	minutes
2	45
– 1	05

Subtracting time in hours and minutes by regrouping

Example

	hours	minutes
	3	15
–	1	45
	1	30

Steps

1. Subtract minutes: 15 – 45; it is not sufficient. Take 1 hour from 3 hours and regroup it into minutes.
   1 hour = 60 minutes.
   Add minutes; 60 + 15 = 75.

   Now, subtract minutes; 75 – 45 = 30.
   Write 30 in the minutes column.
   Remember, 2 hours remained to subtract from.

	hours	minutes
	2	75
	~~3~~	~~15~~
–	1	45
		30

2. Subtract hours: 2 – 1 = 1. Write 1 in the hours column.

	hours	minutes
	2	75
	~~3~~	~~15~~
–	1	45
	1	30

Therefore, the answer is 1 hour and 30 minutes.

Exercise 8

Answer the following questions:

1.

hours	minutes
3	25
– 1	55

2.

hours	minutes
4	14
– 1	37

3.

hours	minutes
4	40
– 1	50

4.

hours	minutes
5	20
– 2	50

5.

hours	minutes
2	12
– 1	49

6.

hours	minutes
9	15
– 6	50

7.

hours	minutes
5	30
– 1	45

8.

hours	minutes
5	00
– 1	59

9.

hours	minutes
5	35
– 2	50

10.

hours	minutes
3	15
– 1	45

11.

hours	minutes
8	15
– 5	55

12.

hours	minutes
4	12
– 1	50

13.

hours	minutes
7	11
– 3	35

14.

hours	minutes
5	45
– 3	50

15.

hours	minutes
6	05
– 3	36

16. Today is the first day for Doto to be at the Scout camp. The following is the table which shows the schedule of activities:

Start time	End time	Activity
7:00 morning	8:00 morning	Breakfast
8:00 morning	9:00 morning	Physical exercise
9:00 morning	10:45 morning	Theoretical lessons
10:45 morning	12:15 afternoon	Practical lessons
12:15 afternoon	1:45 afternoon	Lunch break
1:45 afternoon	4:15 evening	Practical lessons
4:15 evening	6:00 evening	Entertainment

Use the table to answer the following questions:

(a) How long does the lunch break take?

(b) How long does a practical lesson take?

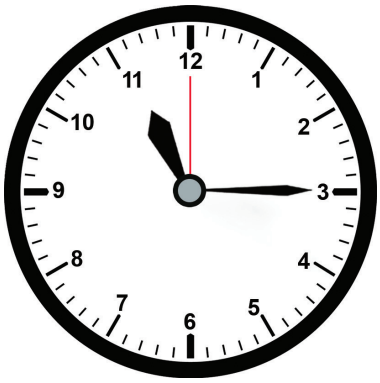
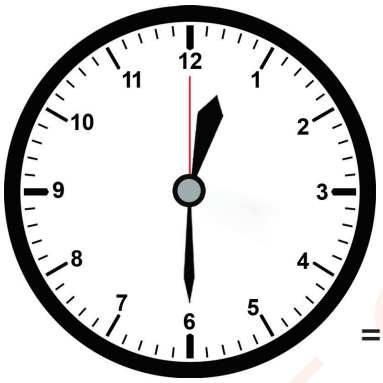
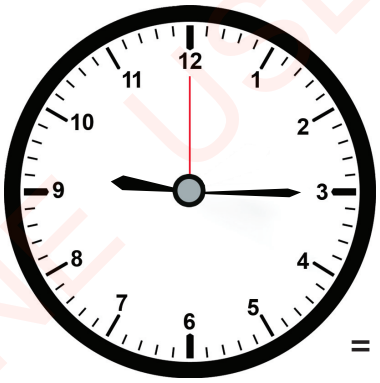
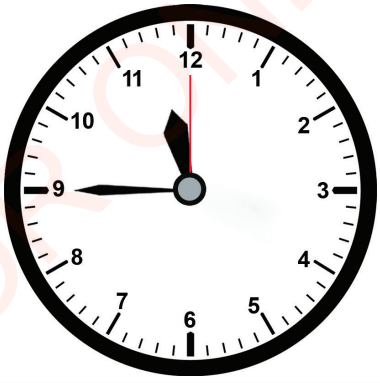
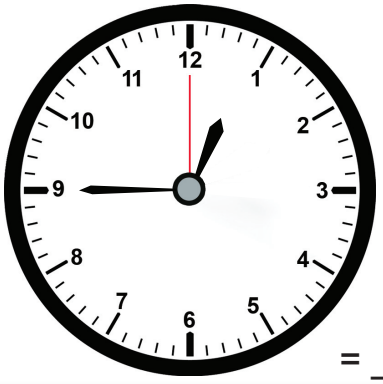
(c) Name the activity Doto does at 3:45 in the evening.

(d) What does Doto do at 8:25 in the morning?

(e) Which activities that take more than 1 hour and 30 minutes?

(f) What does Doto do at 5:30 in the evening?

17. Activities at a certain place start and end as shown on the clock faces. Write the time taken by each activity in the space provided.

	Start	End	
(a)			= _____
(b)			= _____
(c)			= _____

Word problems involving time

Example

The timetable at Maendeleo Primary School starts at 8:45 in the morning and ends at 16:40 in the evening. How much time in hours and minutes is required to complete the school timetable?

Solution

Time required = Ending time – Starting time
= 16:40 – 8:45

	hours	minutes
	16	40
–	8	45
	7	55

Steps

1. Subtract minutes: 40 – 45; it is not sufficient.
2. Take 1 hour from 16 hours and regroup it into 60 minutes.
   Add minutes; 60 + 40 = 100.
3. Now, subtract minutes; 100 – 45 = 55.
4. Write 55 in the minutes column. Remember, 15 hours remained to subtract from.
5. Subtract hours: 15 – 8 = 7.
6. Write 7 in the hours column.

Therefore, the duration required to complete the school timetable is 7 hours and 55 minutes.

Exercise 9

Answer the following questions:

1. Find the difference in time between 10:15 in the morning and 1:45 in the afternoon.
2. Rehema is a pupil in Standard Four at Mtakuja Primary School. She spends 2 hours and 15 minutes for individual studies when she is at home. If she starts studying at 7:15 in the evening, at what time will she stop?
3. Zakaria left home for school at 6:30 in the morning. He walked for 45 minutes. At what time did he arrive at school?
4. Footballers spent 1 hour and 30 minutes in a football match. If they started at 6:00 in the evening. At what time did they finish the match?
5. Mwasi arrived at school at 6:15 in the morning. She was 15 minutes late. At what time was she supposed to arrive?
6. Ndiba spent 1 hour and 55 minutes to walk from his home to the market. If he arrived at the market at thirty minutes past eight in the morning, at what time did he start the journey?
7. Rosa is a timekeeper at her school. She rings a bell every 40 minutes. If she had rang a bell at 8:40 in the morning. What will be the next time to ring the bell?
8. An examination started at 9:15 in the morning and ended at 12:15 in the afternoon. How long did the examination take?
9. A 40 minute Mathematics lesson ended at 11:20 in the morning. When did it start?
10. A bus left Tanga bus stand at 6:00 in the morning and arrived in Dodoma at 5:45 in the evening. How long did the journey take?

11. Vanessa arrived at school at 6:15 in the morning. She arrived 1 hour and 45 minutes earlier. When was she supposed to arrive?

12. Choose the words from list B and write them against the words in list A to make the meaningful statement.

List A	List B
(i) 90 minutes	a. Show the hours
(ii) Long arrow	b. Equal to a quarter of an hour
(iii) Short arrow	c. Show 12 hours
(iv) 15 minutes	d. Show the minutes
(v) 30 minutes	e. Equal to 60 minutes
	f. Equal to half of an hour
	g. Equal to a quarter to an hour
	h. Equal to one hour and a half

Summary

1. The face clock has three arrows. The short and thick arrow shows the hours, the long arrow shows minutes and the longest and thin arrow shows seconds.

2. 1 hour is equal to 60 minutes.

Chapter Ten

Tanzanian Currency

Introduction

In this chapter, you will learn how to add, subtract and multiply Tanzanian Currency. Also, you will solve word problems which involve buying and selling of things. This competence will help you to know the value of Tanzanian money in buying, selling things and solve word problems which involves money in daily life activities.

Exercise 1: Revision

Answer the following questions:

1. State the value of each of the following currency notes:

_____

_____

_____

_____

2. sh 8 700 + sh 900 =
3. sh 980 – sh 470=
4.
$$\begin{array}{rr} & \text{sh } 2\,800 \\ + & \text{sh } 550 \\ \hline & \\ \hline \end{array}$$
5.
$$\begin{array}{rr} & \text{sh } 4\,450 \\ - & \text{sh } 2\,200 \\ \hline & \\ \hline \end{array}$$
6. sh 8 900 – sh 800 =
7. sh 9 990 – sh 8 990 =
8. sh 450 + sh 7 300 + sh 1 100 =
9. A teacher in charge of school projects got 1 950 Tanzanian shillings after selling eggs and 6 500 Tanzanian shillings after selling chicken. How much money did he collect altogether?
10. Nuru bought a goat at 55 000 Tanzanian shillings and then sold it at 70 500 Tanzanian shillings. How much profit did she get?

Addition of Tanzanian Currency

Adding currency is the same as adding whole numbers. In adding currency, add ones, tens, hundreds, thousands and finally ten thousands.

Example

1. sh 71 400 + sh 24 500 = sh 95 900
2. sh 19 850 + sh 45 350 = sh 65 200

3.
	sh	11 650
+	sh	78 450
	sh	90 100

Exercise 2

Answer the following questions:

1. sh 25 300 + sh 60 200 =
2. sh 52 670 + sh 17 380 =
3. sh 36 800 + sh 44 000 =
4. sh 11 500 + sh 80 150 =
5. sh 66 000 + sh 3 500 =
6. sh 27 800 + sh 71 050 =
7. sh 54 050 + sh 11 450 =
8. sh 75 000 + sh 3 900 =

9.
	sh	27 800
+	sh	39 400

10.
	sh	70 880
+	sh	16 970

11.
	sh	56 280
+	sh	38 270

12.
	sh	78 850
+	sh	5 850

13.
	sh	9 800
+	sh	65 700

14.
	sh	40 500
+	sh	38 500

15.
	sh	25 750
+	sh	50 250

16.
	sh	20 550
+	sh	46 450

17.
	sh	36 990
+	sh	23 030

18.
	sh	52 400
+	sh	10 800

19.
	sh	66 270
+	sh	5 500

20.
	sh	70 700
	sh	12 500
+	sh	1 150

Subtraction of Tanzanian Currency

Subtracting currency is the same as subtracting whole numbers.

Examples

1. sh 48 000 – sh 5 550 = sh 42 450
2. sh 90 900 – sh 75 300 = sh 15 600
3.

	sh	90 800
–	sh	36 950
	sh	53 850

Exercise 3

Answer the following questions:

1. sh 1 700 – sh 1 200 =
2. sh 9 250 – sh 2 100 =
3. sh 92 450 – sh 38 510 =
4. sh 93 500 – sh 40 650 =
5. sh 74 000 – sh 35 600 =
6. sh 99 999 – sh 86 700 =
7.

	sh	72 300
–	sh	54 200

8.

	sh	60 250
–	sh	28 970

9.

	sh	85 600
–	sh	32 500

10.

	sh	44 450
–	sh	3 750

11.

	sh	99 100
–	sh	65 700

12.

	sh	80 560
–	sh	60 590

13.

	sh	75 750
–	sh	25 920

14.

	sh	35 000
–	sh	20 090

15.

	sh	21 800
–	sh	15 350

16.

	sh	42 300
–	sh	18 800

17.

	sh	84 500
–	sh	53 950

Multiplication of Tanzanian Currency

Multiplication of currency is done by multiplying currency by a number.

Examples

1. sh 750 × 4 = sh 3 000

2.

	sh	650
×		7
sh	4	550

Exercise 4

Answer the following questions:

1.

	sh	950
×		7

2.

	sh	75
×		13

3.

	sh	560
×		12

4.

	sh	105
×		80

5.

	sh	200
×		25

6.

	sh	960
×		14

7. sh 160 × 6 =

8. sh 960 × 36 =

9. sh 635 × 16 =

10. sh 87 × 15 =

11. sh 340 × 15 =

12. sh 950 × 9 =

13. sh 107 × 30 =

Word problems on addition

Example

Mapunda spent 45 000 Tanzanian shillings to buy some milk and 52 500 Tanzanian shillings for transport. How much money did he spend for milk and transport altogether?

Solution

Milk		sh 45 000
Transport	+	sh 52 500
Total		sh 97 500

Therefore, Mapunda spent 97 500 Tanzania shillings.

Exercise 5

Answer the following questions:

1. Jane got a loss of 2 500 Tanzanian shillings after selling a commodity for 87 500 Tanzanian shillings. What was the original price of the commodity?
2. A vegetable vender got 5 000, 2 000 and 1 000 Tanzanian shillings notes and 200 Tanzanian shillings coin after selling some vegetables. Calculate the total money she got.
3. A pupil bought a Mathematics book at 5 500 Tanzanian shillings and an exercise book at 2 600 Tanzanian shillings. How much money did she spend on her purchases?
4. Bupe bought rice at 38 000 Tanzanian shillings from a wholesaler. She got a profit of 6 000 Tanzanian shillings after selling it. How much money did she get after selling the rice?

5. Juhudi got 1 000 Tanzania shillings from her mathematics teacher as a gift for passing examination. She also, received 1 700 Tanzanian shillings from her mother. If Juhudi had 350 Tanzanian shillings before, how much money did she have?
6. Juma bought some maize flour at 9 500 Tanzanian shillings and peas at 14 750 Tanzanian shillings. How much money did he spend in buying both maize flour and peas?
7. Mariam sold mango seedlings at 5 500 shillings and orange seedlings at 4 250 shillings. How much money did she get altogether?
8. Pupils at a certain primary school visited Ruaha National Park. They spent 48 000 Tanzanian shillings for transport and 30 500 Tanzanian shillings for food. How much money did they spend altogether?
9. Tupendane youth group started a bee keeping project. They spent 42 400 Tanzanian shillings to buy beehives and 48 200 Tanzanian shillings to buy honey harvesting equipment. How much money did they spend on starting the project?
10. The Chairperson of Umoja Village collected 32 750 Tanzanian shillings from different volunteers for elderly people. She also collected 60 300 Tanzanian shillings for orphans. How much money did the chairperson collect altogether?

Word problems on subtraction

Example

Anna had 80 800 Tanzanian shillings. She bought school uniform and exercise book at 20 000 Tanzanian shillings and 17 500 Tanzanian shillings respectively. What was Anna's balance?

Solution

School uniform		sh	20 000
Exercise books	+	sh	17 500
		sh	37 500

Anna spent 37 500 shillings to buy school uniform and exercise books.Subtract the amount she spent from the amount she had before buying school uniform and exercise book.

The amount she had		sh	80 800
The money spent	–	sh	37 500
		sh	43 300

Therefore, Anna was left with 43 300 Tanzanian shillings.

Exercise 6

Answer the following questions:

1. Paul's wage is 60 000 Tanzanian shillings per month. He spends 37 400 Tanzanian shillings and deposits the balance to his bank account. How much money does he deposit?
2. Pendo had 90 000 Tanzanian shillings. She bought bed sheets at 32 500 Tanzanian shillings and a gown at 40 000 Tanzanian shillings. How much money did she remain with?

3. Safina was given 1 000 Tanzanian shillings by her mother for expenses at school. She bought a bottle of drinking water at 450 Tanzanian shillings and chapatti at 300 Tanzanian shillings. How much money did she remain with?
4. Musa got a profit of 2 070 Tanzanian shillings after selling some maize at 97 650 Tanzanian shillings. How much money did Musa buy the maize?
5. Salum withdrew 85 000 Tanzanian shillings from his bank account. He paid 50 450 Tanzanian shillings for electricity bill and 15 000 Tanzanian shillings for water bill. How much money did he remain with?
6. Mr Fungafunga bought a goat at 30 000 Tanzanian shillings and a chicken at 11 500 Tanzanian shillings. What was his balance if he had 70 000 Tanzanian shillings?
7. Furaha had 10 000 Tanzanian shillings. She gave it to her two children for transport. If the first child was given 4 600 Tanzanian shillings, how much money was given to the second child?
8. A businessman had 7 500 Tanzanian shillings. How much more money did he need in order to buy 24 bottles of soft drinks if each bottle cost 500 Tanzanian shillings?
9. A head teacher bought a book at 6 500 Tanzanian shillings. She also bought 10 exercise books which cost 250 Tanzanian shillings each. She gave the shopkeeper a 10 000 Tanzanian shilling note. How much balance did she receive from the shopkeeper?
10. Nasibu gave a bus conductor a 10 000 Tanzanian shillings note to buy a bus ticket worth 6 500 Tanzanian shillings. How much balance did he receive from the bus conductor?

Word problems on multiplication

Example

A tea bag is sold at 500 Tanzanian shillings. How much do you pay for 12 tea bags?

Solution

sh	500
×	12
	1 000
+	5 000
sh	6 000

Therefore, the price for buying 12 tea bags is 6 000 Tanzanian shillings.

Exercise 7

Answer the following questions:

1. A pen is sold at 250 Tanzanian shillings. How much money is needed to buy 13 pens of the same kind?
2. Machinga sold 40 dishes. If one dish was sold at 650 Tanzanian shillings, how much money did he get?
3. If the price of a watermelon is 850 Tanzanian shillings, how much money does Amina need to buy 10 watermelons?
4. One kilogram of tomatoes is sold at 2 500 Tanzanian shillings. How much money is needed to buy 50 kilograms of tomatoes?
5. A business person bought 50 loaves of bread. He bought them at 950 Tanzanian shillings each. Later on, he decided to sell them. If he sold them at 800 Tanzania shillings each, what was his loss?

6. Kabibi sold 20 mangoes. One mango was sold at 500 Tanzanian shillings. How much money did Kabibi get?
7. A taxi driver charges his passengers 950 Tanzanian shillings per kilometre. How much money does he charge for a 27 kilometres trip?
8. Azimio Primary School pays 36 500 Tanzanian shillings per month for electricity bill. How much money will the school pay for electricity in two months?
9. Zuwena gets 750 Tanzanian shillings after selling ice creams everyday. How much money will she get in one week?
10. A bus has 32 passengers. The fare is 450 Tanzanian shillings per passenger. How much money will be collected from all the passengers?

Summary

1. You add and subtract currency by currency.
2. You multiply currency by a number.

Chapter Eleven

Metric units

Introduction

In Standard Three, you learnt reading and measuring metric units of length and mass. In this chapter, you will learn how to convert metric units of length, mass and volume. You will also solve word problems which involve metric units. This knowledge will help you to do several activities in your daily life such as measuring length of a piece of timber, weight of a person, volume of bottles and other real objects.

Exercise 1: Revision

Fill in the blanks with the appropriate metric units and quantity to be measured.

Object to be measured	Units	Quantity
1. Fabric	Example: Metre	
2. Wheat flour		Example: Mass
3. Ruler		
4. Sugar		
5. Peanuts		
6. Thread		
7. Tea spices		

Activity 1

1. Measure and record the measurements of items in the following table then answer questions 2, 3 and 4:

	Item	Measurement
(a)	Width of Mathematics book	
(b)	The length of a pen	
(c)	The width of exercise book	
(d)	The length of desk	
(e)	The length of pencil	
(f)	The width of ruler	

2. Which is the longest between a pen and Mathematics book?
3. Which is the widest between Mathematics book and exercise book?
4. Which is the longest between a ruler and desk?

Activity 2

1. Measure and record the mass of the items in the following table:

	Item	Mass
(a)	Mathematics book	
(b)	An empty soft drink bottle	
(c)	An exercise book	
(d)	A box of chalks	

2. Consider the items in 1 above:
   (a) Which one is the lightest?
   (b) Which one is the heaviest?

Conversion of units of length

The basic standard metric unit of length is a metre (m). Other commonly used units of the length are millimetres (mm), centimetres (cm) and kilometres (km). The measurements of length can be converted from one unit to another unit. The relationships of metric units of length will help you in conversions of units.

(a) 1 centimetre (cm) = 10 millimetres (mm)
(b) 1 metre (m) = 100 centimetres (cm)
(c) 1 metre (m) = 1 000 millimetres (mm)
(d) 1 kilometre (km) = 1 000 metres (m)

Conversion of large units of length to small units

Example 1

Convert 3 m into cm.

Solution

1 m = 100 cm
3 m = 100 cm × 3
= 300 cm
Therefore, 3 m = 300 cm.

Example 2

Convert 5 km 250 m into m.

Solution

1 km = 1 000 m
5 km = 1 000 m × 5 = 5 000 m
Add 5 000 m and 250 m to get 5 250 m.

Therefore, 5 km 250 m = 5 250 m.

Exercise 2

Answer the following questions:

1. Convert the following measurements into metres (m):

(a) 17 km (b) 85 km (c) 36 km (d) 19 km
(e) 35 km 20 m (f) 34 km 15 m (g) 7 km 500 m (h) 10 km 750 m

2. Convert the following measurements into centimetres (cm):

(a) 13 m (b) 2 m (c) 9 m (d) 2 100 m
(e) 990 m (f) 34 m 15 cm (g) 62 m 40 cm (h) 341 m 9 m

3. Convert the following measurements into millimetres (mm):

(a) 5 cm (b) 30 cm (c) 12 cm (d) 8 cm
(e) 102 cm (f) 1 cm 6 mm (g) 50 cm 8 cm (h) 900 cm 90 mm

Conversion of small units of length to large units

Example 1

Convert 500 cm into m.

Solution

1 m = 100 cm. Therefore,
500 cm = 500 m ÷ 100,
= 5 m.

Example 2

Convert 4 500 m into km.

Solution

1 km = 1 000 m. Therefore,
4 500 m = 4 500 m ÷ 1000
= 4 km 500 m

Exercise 3

Answer the following questions:

1. Convert the following measurements into kilometres:

(a) 9 000 m (b) 15 000 m (c) 6 000 m (d) 1 750 m
(e) 9 500 m (f) 8 000 m (g) 9 750 m (h) 1 025 m

2. Convert the following measurements into metres:

(a) 2 000 cm (b) 150 cm (c) 600 cm (d) 1 550 cm
(e) 275 cm (f) 400 cm (g) 325 cm (h) 2 025 cm

3. Convert the following measurements into centimetres:

(a) 40 mm (b) 100 mm (c) 250 mm (d) 245 mm
(e) 500 mm (f) 600 mm (g) 900 mm (h) 550 mm

Measuring length

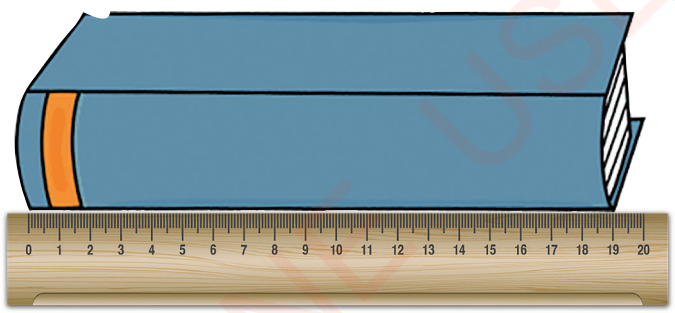
Lengths of objects can be measured using a ruler or a tape measure.

Activity 1

Use a ruler to measure the length of a book in cm and mm.

Steps

1. Prepare a ruler and a book.
2. Put a ruler on a book. One of the edges of the book must be at the 0 mark of the ruler.
3. Count centimetres from one edge to the other edge of the book.
4. Write the length of the book in cm or mm.



Activity 2

Measure and record the length of each of the following objects in cm and mm:

	Objects	cm	mm
(a)	Length of chalk board		
(b)	Length of classroom		
(c)	Width of classroom		
(d)	Width of a window		
(e)	Width of a door		

Exercise 4

Among the metric units, namely cm, m and km which one will be used to measure the following items?

1. The length of desk.
2. The distance from school to the market.
3. The height of our National Flag pole at school.
4. The distance from your home to school.
5. The length of your pen.

Word problems on measurements of length

Example 1

The length of the football ground is 100 metres. Convert this length into centimetres.

Solution

Convert 100 m into cm

1 m = 100 cm

100 m = 100 cm × 100

= 10 000 cm

100 m = 10 000 cm

Therefore, the length of the football ground is 10 000 centimetres.

Example 2

Fausta walked 8 km 700 m from the market to her work place. Tasha walked 6 928 m from the market to her home.

(a) Who walked a longer distance?

(b) From (a), what was the difference of their journey in metres?

Solution

(a) Distance covered by Fausta = 8 km 700 m.

Convert 8 km into m

1 km = 1 000 m

8 km = 1 000 m × 8

= 8 000 m

The distance Fausta walked:
8 000 m + 700 m = 8 700 m

But, Tasha walked a distance of 6 928 m which is short than 8 700 m.

Therefore, Fausta walked a longer distance than Tasha.

Solution

(b) The difference is,

8 700 m – 6 928 m = 1 772 m

Fausta walked 1 772 m longer than Tasha.

Exercise 5

Answer the following questions:

1. The length of standard four classroom is 6 m 75 cm. Write the length of the classroom in cm.
2. The distance from a market to lake Tanganyika is 12 km. Write this distance in metres.
3. Bulali bought a 50 m piece of cloth. Kulwa bought a 200 cm piece of cloth. Who bought a longer piece of cloth than the other?
4. The distance from a school to a dispensary is 800 m. The distance from the same school to the market is 1 km. Which of the two places is far away from the school?
5. Sadoki walked 2 000 m from his home to school. Find the total distance to and from school.
6. Hashimu ate 128 cm sugarcane while Rehema ate 1 m sugarcane. Who ate longer sugarcane than the other?
7. The distance from standard four classroom to the football ground is 7 000 cm. The distance from standard four classroom to the head teacher's office is 70 m. Which of the two places is far from standard four classroom?
8. Bahati walks 3 km 500 m every morning and 1 km 500 m every evening. Dotto walks 5 km every morning. Who walks a longer distance than the other?

Conversion of metrics units of mass

The standard metric unit of mass is gram (g). Other units of mass which are often used are milligram (mg) and kilogram (kg).

1 kilogram (kg) = 1 000 grams (g)

1 gram (g) = 1 000 milligrams (mg)

Example 1

Convert 4 kg into g

Solution

1 kg = 1 000 g

4 kg = 1 000 g × 4

= 4 000 g

Therefore, 4 kg = 4 000 g

Example 2

Convert 7 000 g into kg

Solution

1 kg = 1 000 g

? = 7 000 g

$$= \frac{7\,000\ \cancel{g} \times 1\ kg}{1\,000\ \cancel{g}}$$

Therefore, 7 000 g = 7 kg

Exercise 6

Answer the following questions:

1. Fill in the blanks in the following table:

kg	1		3		5		7		9	
g	1 000	2 000		4 000		6 000		8 000		10 000

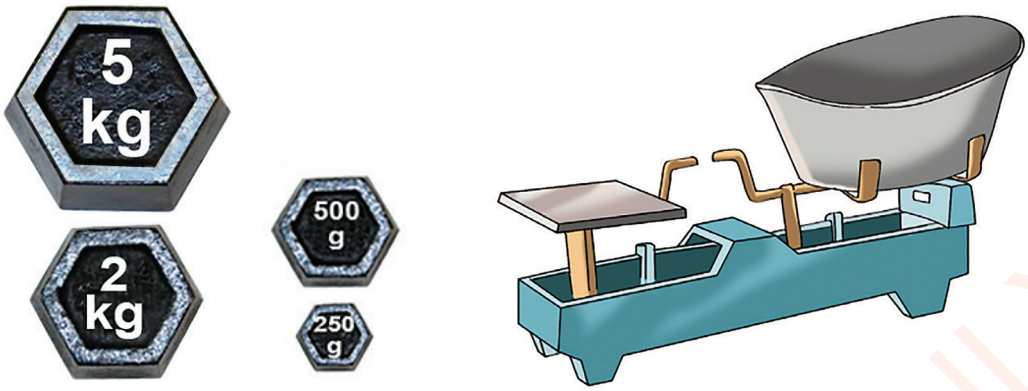
2. Convert the following kilograms into grams:

(a) 2 kg (b) 11 kg (c) 2 kg (d) 3 kg
(e) 45 kg (f) 67 kg (g) 8 kg (h) 89 kg

3. Convert the following grams into kilograms:

(a) 1 000 g (b) 15 000 g (c) 64 000 g (d) 3 000 g
(e) 42 000 g (f) 3 000 g (g) 5 000 g (h) 58 000 g

Measuring mass



Identifying measurements of mass

Activity 1

Use a beam balance to measure the mass of sand in grams and kilograms.

Steps

1. Prepare sand and a beam balance.
2. Balances the beam balance so that it reads two kilograms and half.
3. Measure two kilograms and half of sand in the beam balance.
4. Write the mass of sand in grams or kilograms.

Activity 2

Study the following list of masses and answer the questions that follow:

1.	16 000 grams	4.	5 kg
2.	5 000 g	5.	100 milligrams
3.	25 kg	6.	6 500 g

(a) Which mass in grams is the lightest?
(b) Which mass in grams is the heaviest?
(c) Which mass in kilograms is the lightest?
(d) Which mass in kilograms is the heaviest?

Word problems on mass

Example

The mass of Iddi is 24 kg while the mass of Penina is 24 450 g. Who is heavier than the other?

Steps

1. Convert the mass of Iddi into grams

   1 kg = 1 000 g

   24 kg = 1 000 g × 24

   = 24 000 g

2. Compare their mass:

   24 450 g is heavier than 24 000 g.

   Therefore, Penina is heavier than Iddi.

Exercise 7

Answer the following questions:

1. Convert 5 250 g into kg.
2. Which is heavier than the other, a mass of 2 000 g or 20 kg?
3. How many grams are in 2 kg?
4. Which is heavier than the other, 1 kg of salt or 1 kg of cotton?
5. Pepe bought 3 kg 500 g of fish. How many grams of fish did he buy?
6. Elia bought three quarters of a kilogram of rice. Convert the kilograms into grams.

7. Mao, Zawadi and Furaha weighed their masses. Mao weighed 32 kg, Zawadi weighed 30 kg and Furaha weighed 30 750 g:
   (a) Who is the heaviest among of the three?
   (b) Who is the lightest among of the three?
8. Grandmother bought 2 kg of millet flour, 1 kg of sugar and 500 g of powder milk. How many grams did she buy altogether?
9. One loaf of bread weighs half a kilogram. Find in grams the mass of five loaves of bread of the same type.
10. My sister bought 2 kg of tomatoes and 500 g of onions. How many grams did she buy altogether?
11. Adam's mass is 34 kg, while Kateri's mass is 34 700 g. Who is heavier than the other?
12. A chicken weighed 3 kg before it was cooked. If the chicken weighed 2 kg 750 g after being cooked, how many grams were lost?

Metric units of volume

The basic standard metric unit of volume is litre (l). Another unit often used to measure volume is millilitre (ml).

1 litre (l) = 1 000 millilitres (ml)

Identifying measurements of volume

Study the following table and answer the questions which follow:

Jug	Litre	Bottle	Beam balance
Ruler	Box	Syringe tube	Bucket

1. Which instruments are used to measure the volume?
2. Which unit is used to measure volume?
3. List down the instrument which can be used to measure:
   (a) large volume
   (b) small volume.

Measuring volume

Activity

1. Take a jug and fill it with water. Use the jug to fill a 10 litre bucket.
2. How many jugs of water filled the bucket?
3. What is the volume of the jug?

Read the following information and answer the questions that follow:

Faraja measured 150 ml of juice and filled it into the bottle. She drank some of the juice and 65 ml remained. After some rest she added 220 ml of juice in the bottle. Again she drank some and 25 ml of juice remained.

(a) How much ml of juice she drank at first?
(b) How much ml of juice she added in the bottle?
(c) How much ml of juice she drank at second?
(d) Faraja drank how much ml of juice in total?
(e) What was the amount of juice remained in the bottle?

Word problems on volume

Example

A cow produces 20 litres of milk every day. How many litres will it produce in 3 days?

Solution

1 day = 20 litres
3 days = 20 litres × 3 = 60 litres

Therefore, the cow will produce 60 litres of milk in 3 days.

Exercise 8

Answer the following questions:

1. If the price of 1 litre of oil is 4 000 Tanzanian shillings, what is the cost of 3 litres?
2. Arrange the following in ascending order: 450 ml, 40 ml, 4 ml and 400 ml.
3. A gas tank contains 5 litres of gas. If 3 litres have been used up, how many litres are left in the tank?
4. How many 500 ml bottles are required to fill a 20 litres bucket?
5. How many 5 litre buckets are required to fill a 500 litre tank?
6. A 1 000 ml thermos flask has 750 ml of milk. How many more millilitres of milk are required to fill it?
7. Lina, Sanka and Imani filled a bucket with water. If Lina filled 5 litres, Sanka 2 litres and Imani 3 litres, how many litres did they fill in the bucket?
8. Sia bought some 1 500 ml juice. If she drank 500 ml of the juice, how much juice remained?
9. Mbale drinks 3 litres of water while Senga drinks 2 000 millilitres of water everyday. Who drinks more water than the other?

10. Match and write the words from **list A** with words in **list B** to get a meaningfully statement.

List A	List B
(i) Measurements	(a) Amount of physical quantities
(ii) Mass	(b) A group of people
(iii) Length	(c) metre, gram and litre
(iv) Volume	(d) Measured in grams
(v) Units	(e) Drawing pencil
	(f) Measured in metres
	(g) Measured in litres

Summary

1. The basic metric unit of length is a metre (m).
2. The basic metric unit of mass is a gram (g).
3. The basic metric unit of volume is a litre (l).

Chapter Twelve

Geometry

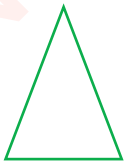
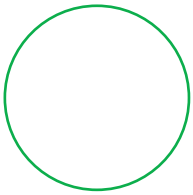
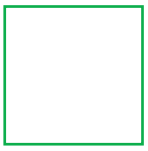
Introduction

In Standard Three, you learnt plane figures and non-plane figures. In this chapter, you will learn line segments, rays and drawing straight lines. You will also learn how to find the perimeter of a rectangle, square and triangle as well as solving word problems on perimeters of these geometrical figures. This knowledge will help you to deal with real life activities such as finding the perimeter of a classroom and various plane figures.

Exercise 1: Revision

Answer the following questions:

1. Write the names of three objects with plane figures found in your surroundings.
2. Write down three examples of non-plane figures in your environments.
3. Use a paper or sticks to make any four plane figures.
4. Which of the following figures are plane?

(a)	(b)	(c)	(d)
			
(e)	(f)	(g)	(h)
			

Line segments, rays and straight lines

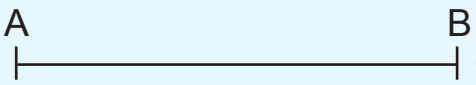
Line segments

Activity 1

Using a ruler, pencil and piece of paper, draw a line segment.

Steps

1. Put a ruler on paper and mark the starting point, say at 0 cm, and the end point, say 7 cm from the starting point.
2. Using a ruler, draw a straight line joining the two points.
3. Put vertical marks at the two points.
4. Remove the ruler and label the starting and ending marks using capital letters, say A and B or X and Y or C and D.



5. Write the name of this line segment.
6. This line segment is written in short form as $\overline{AB}$ or $\overline{XY}$ or $\overline{CD}$. You can use other letters, say $\overline{MN}$ or $\overline{GK}$ if the end points are labelled differently.

Example

Draw a line segment with 6 cm long and write its name.

Diagram	Name of a line segment
A 6 cm B	Line segment AB or $\overline{AB}$

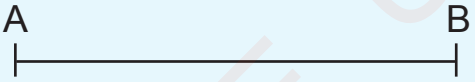
A ray

Activity 2

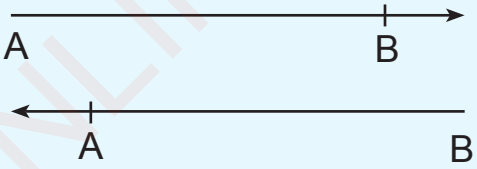
Draw a ray.

Steps

(a) Use a ruler to draw a line segment AB.



(b) Extend this line segment to the right or to the left. Put an arrow.



In this step, you have drawn two rays; ray $\overrightarrow{AB}$ and ray $\overrightarrow{BA}$. In short form, the ray AB is written as $\overrightarrow{AB}$ or $\overrightarrow{BA}$, and a ray BA is written as $\overrightarrow{BA}$ *or* $\overleftarrow{AB}$. The symbol $\rightarrow$ denotes a ray.

A ray is formed when a line segment is endless in one direction. The point with an arrow indicates the direction of the ray, while the other point with no arrow is called initial point. Therefore, a ray has a specific direction.

Exercise 2

Draw line segments with the following lengths:

	Line segments
1	PQ = 4 cm
2	CD = 5 cm
3	LM = 6 cm
4	JK = 7 cm
5	XY = 8 cm
6	EF = 9 cm
7	MN = 10 cm

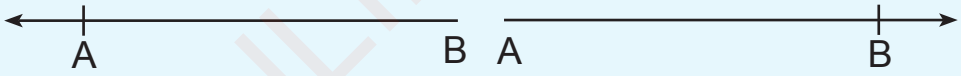
A straight line

Activity

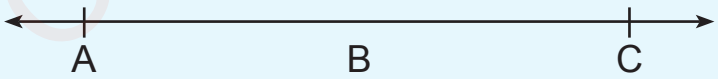
Draw a straight line.

Steps

1. Use a ruler to draw two rays, ray BA and ray BC.



2. Join the two rays to get a straight line.



3. Two rays form a straight line AC or CA.

4. Therefore, the straight line AC or CA is written $\overleftrightarrow{AC}$ or $\overleftrightarrow{CA}$. The symbol $\leftrightarrow$ denotes a straight line.

Exercise 3

Answer the following questions:

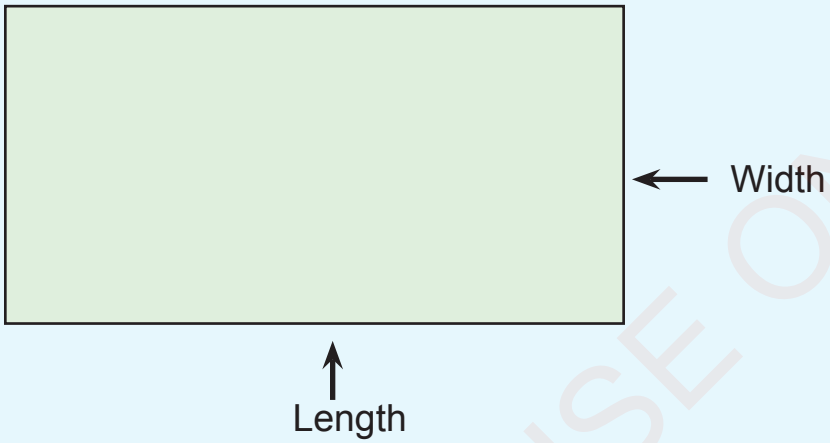
1. Draw two line segments of equal lengths.
2. Draw three straight lines with lengths of your choice. Write the name of each line.
3. What is the difference between a line segment and straight line?
4. Can you draw a straight line without a ruler? Give reasons.
5. Can you draw a 4 cm line segment without a ruler? Give reasons.
6. Draw two rays, XY and YX. Write their names in short form.
7. State the difference between a line segment and a ray.
8. Which instrument is used to measure a line segment?
9. Write six different ways of naming the following line:

10. Draw a line segment PQ. How many end points does the line segment PQ have?
11. Join the ends of the three line segments AB, BC and CA. Write the name of the figure formed.

Perimeters of plane figures

Activity 1

Measuring the perimeter of a rectangle.



Steps

1. Put a mark of the tape measure showing 0 at one corner of the rectangle.
2. Use the tape measure to measure the distance around the rectangle. Read the value of the mark on the tape measure which intercepts the starting point.
3. Measure the distance of each side of the rectangle using a ruler and record the results. Add all the results.
4. Compare the answers in step 2 and step 3.
5. What is the value of the distance around the rectangle?
6. The distance around the figure is called a perimeter.

Activity 2

Measure and write the perimeter of the following objects:

Objects	Perimeter in cm
Set square in a mathematical set	
Rectangular top of a table	

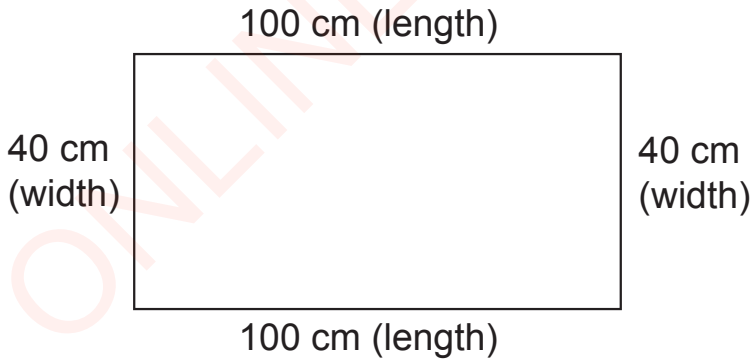
Finding the perimeter of a rectangle, square and triangle

The perimeter of a rectangle, square and triangle can be found by using formulas.

Perimeter of a rectangle

Example

Find the perimeter of the following rectangle:



Solution

Perimeter = length + width + length + width

= 100 cm + 40 cm + 100 cm + 40 cm = 280 cm.

Alternative solution

The rectangle has two equal lengths and two equal widths. Thus,

Perimeter = 2 × length + 2 × width

= 2 × 100 cm + 2 × 40 cm

= 200 cm + 80 cm

= 280 cm

Therefore, the perimeter of the rectangle is 280 cm.

Exercise 4

Answer the following questions:

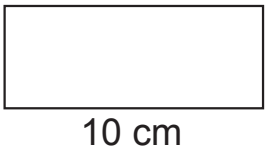
1. Measure the length of your exercise book and write its dimensions in cm. Measure the width of the same exercise book in cm.
   (a) What is the difference between length and width?
   (b) Find the total length of all four sides of the exercise book.
2. Draw any three rectangles with different lengths and widths, each having a perimeter of 12 cm.
3. Draw three rectangles with the following perimeters. Write the length and width of each rectangle.
   (a) 10 cm (b) 18 cm (c) 20 cm
4. Find the perimeter of a rectangle whose length and width are 8 cm and 4 cm respectively.
5. Find the perimeter of the square with a side of 4 cm.
6. What is the difference between a rectangle and a square?

Exercise 5

Find the perimeter of the following rectangles:

1.

2.



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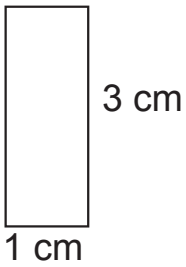

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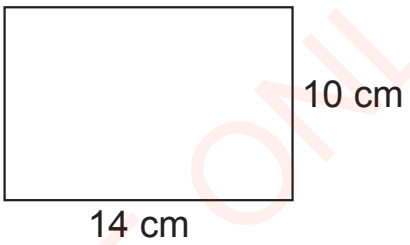

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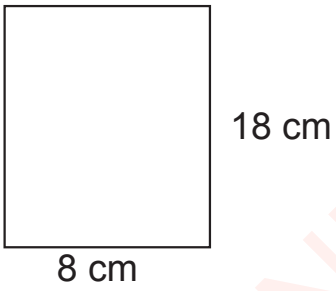

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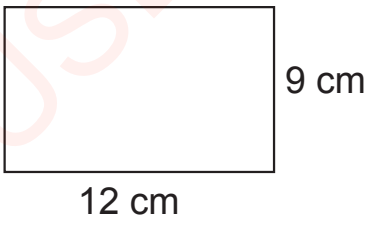

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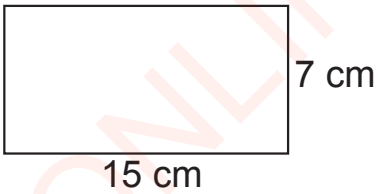

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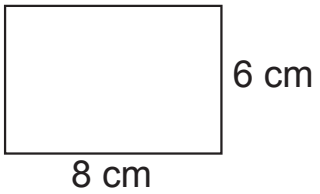

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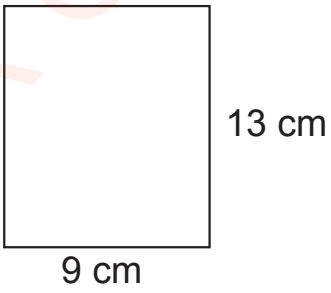

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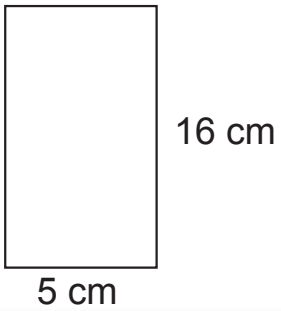
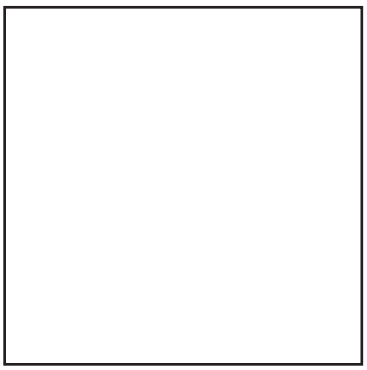


Perimeter of a square

Example

Find the perimeter of the following square.



Solution

Perimeter of a square = length + width + length + width. That is,
Perimeter = 20 cm + 20 cm + 20 cm + 20 cm
Therefore, perimeter = 80 cm

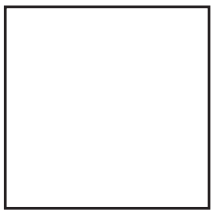
Alternative solution

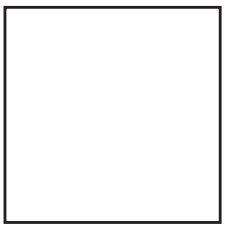
Perimeter of a square = length + width + length + width
But length = width. Replacing width by length you will get,
Perimeter of a square = length + length + length + length
Perimeter of a square = 4 × length
= 4 × 20 cm
Perimeter = 80 cm

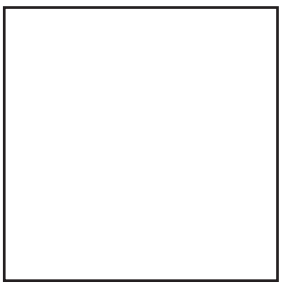
Therefore, the perimeter of the square is 80 cm.

Exercise 6

Find the perimeter of the following squares:

1. 

2. 

3. 

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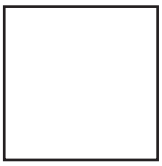
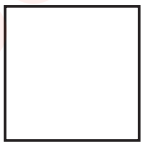
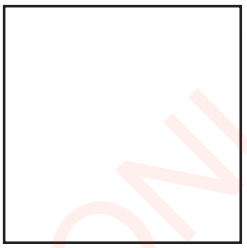
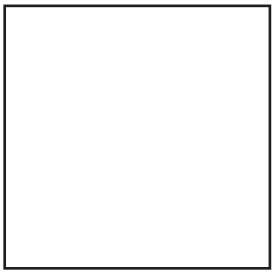
5. 

6. 

7. 

8. 

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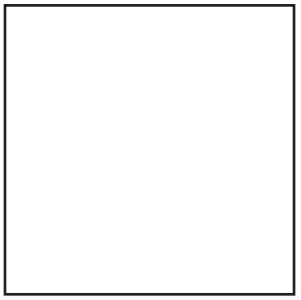
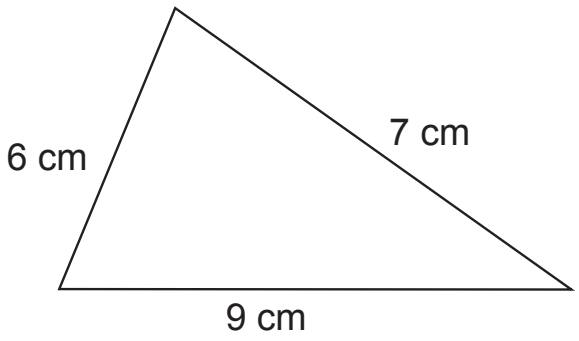
10. 

Perimeter of a triangle

Example

Find the perimeter of the following triangle:



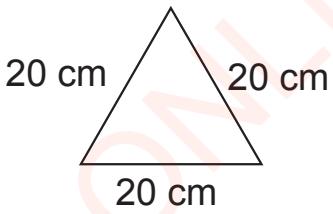
Solution

Perimeter = sum of the lengths of all sides
Perimeter = 6 cm + 7 cm + 9 cm
Perimeter = 22 cm
Therefore, the perimeter of the triangle is 22 cm.

Exercise 7

Find the perimeter of the following triangles:

1.



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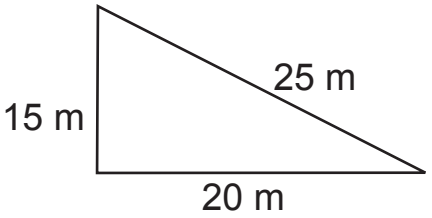

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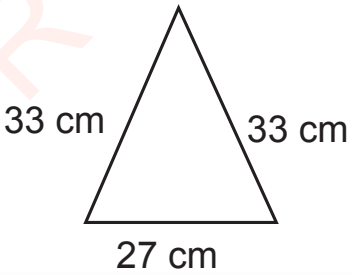

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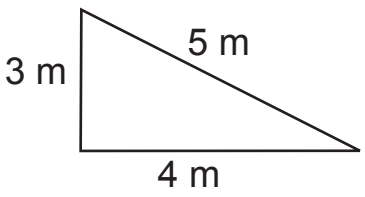

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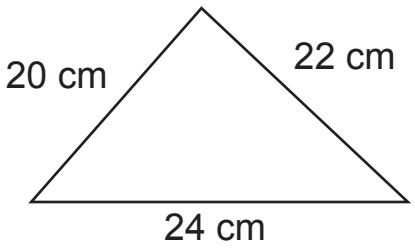

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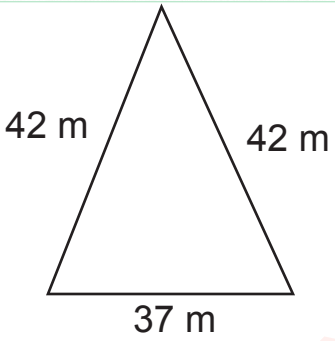

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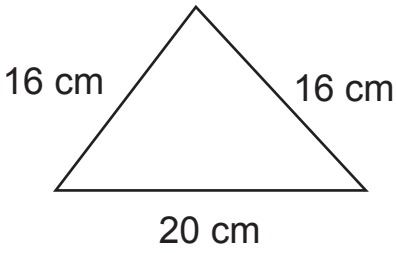

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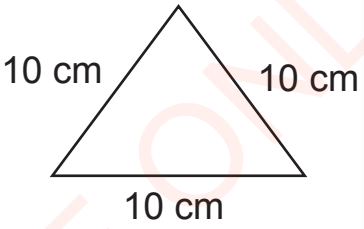

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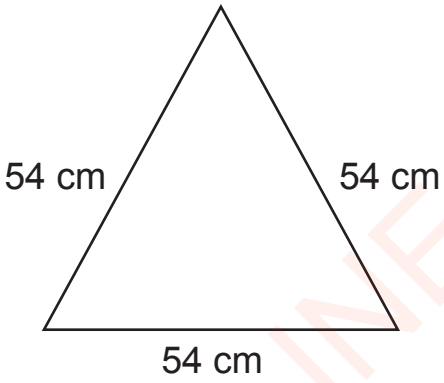

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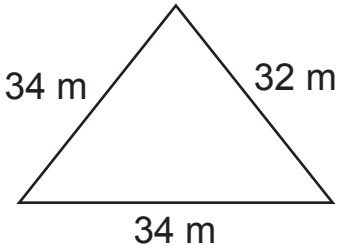
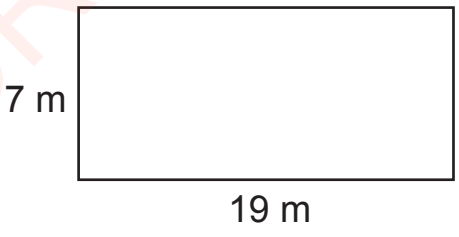


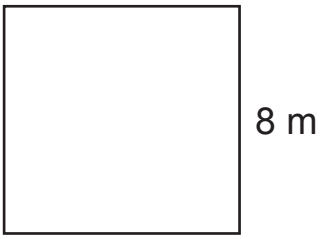
Exercise 8

Find the perimeter of the following figures:

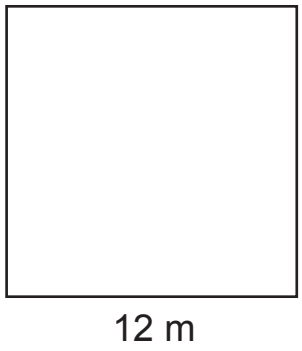
1.



2.



3.



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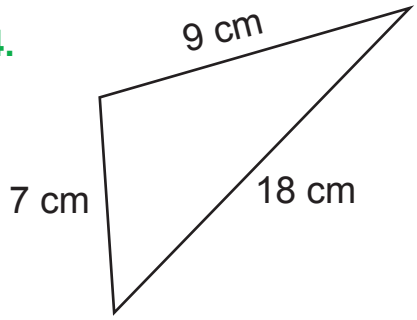

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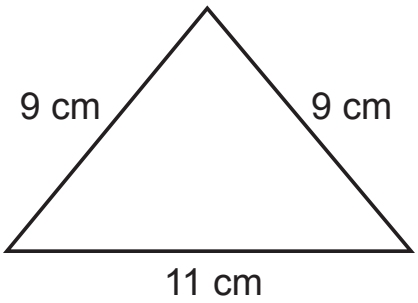

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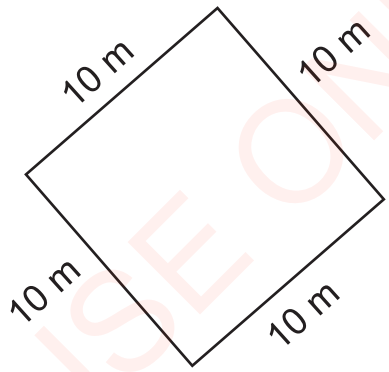

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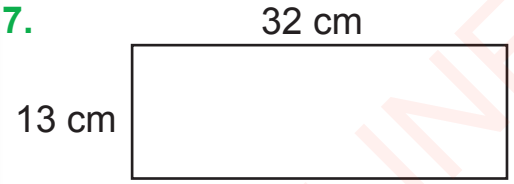

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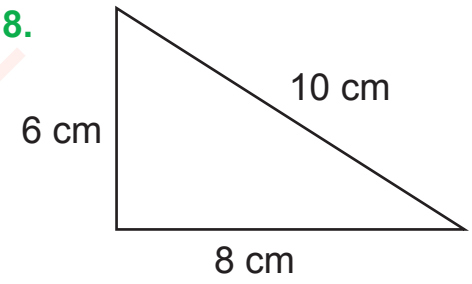

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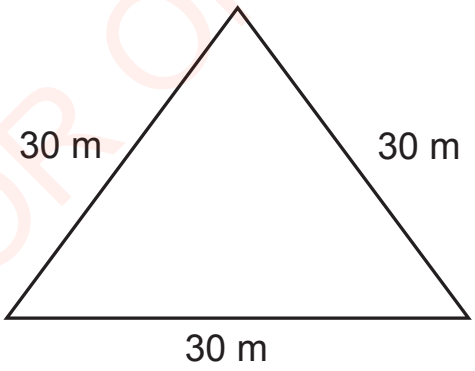

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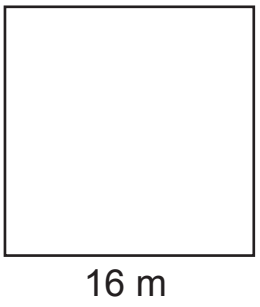
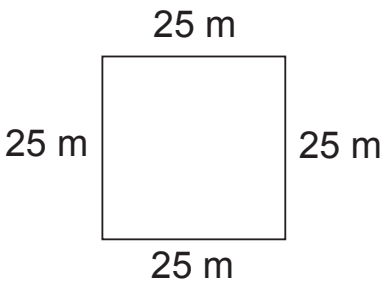


Word problems on perimeter

Example 1

A square flower garden is 25 metres long. Find its perimeter.

Solution



Perimeter = 25 m + 25 m + 25 m + 25 m = 100 m

Alternative solution

Perimeter = 4 × length

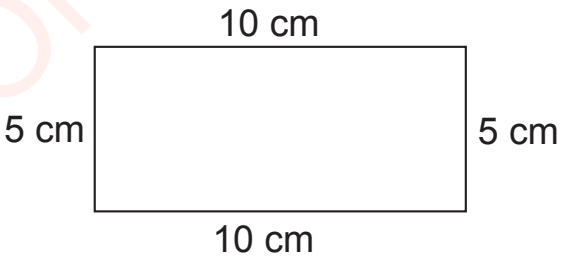
Perimeter = 4 × 25 m = 100 m

Therefore, the perimeter of the flower garden is 100 metres.

Example 2

Mariam drew a rectangle whose length and width are 10 cm and 5 cm respectively. Find its perimeter.

Solution



Perimeter of the rectangle = length + width + length + width

Perimeter of the rectangle = 10 cm + 5 cm + 10 cm + 5 cm = 30 cm

Alternative solution

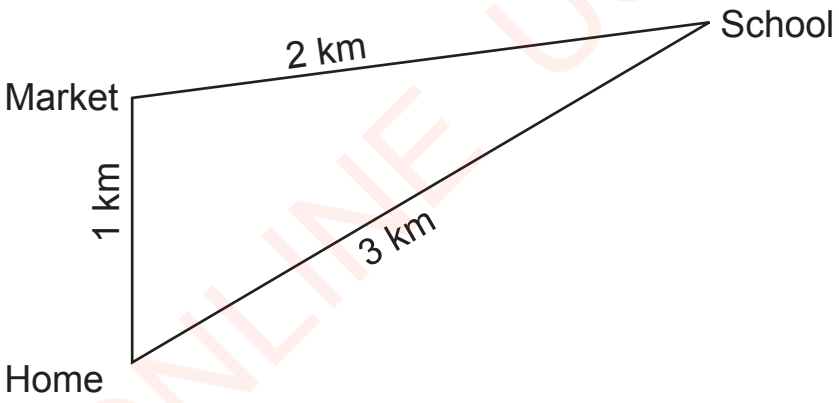
Perimeter = 2 × length + 2 × width
= 2 ×10 cm + 2 × 5 cm
= 20 cm + 10 cm
= 30 cm

Therefore, the perimeter of the rectangle is 30 cm.

Example 3

Ashura walked 3 km from home to school. After school sessions, she went to the market to buy some fruits. The distance from her school to the market is 2 km. If she used a different road to walk 1 km back home, what distance did she walk on that day?

Solution



Perimeter = Distance from home to school + Distance from school to the market + Distance from the market to her home

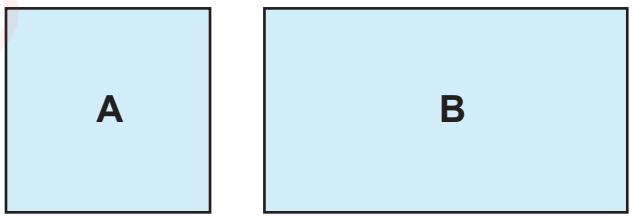
= 3 km + 2 km + 1 km = 6 km

Therefore, Ashura walked 6 km on that day.

Exercise 9

Answer the following questions:

1. The length of one side of a square is 23 cm. Find its perimeter.
2. The perimeter of a rectangle is 80 cm. If its length is 30 cm, find its width.
3. A rectangular school garden is 12 000 cm long and 800 cm wide. Find its perimeter.
4. Find the perimeter of a triangle whose equal sides are 17 cm long each.
5. A side of a square is 16 m long, find its perimeter.
6. Find the length of a rope surrounding a window which is 3 metres long and 2 metres wide.
7. Can a perimeter of a rectangle be equal to the perimeter of a square? Give an example.
8. Draw two different rectangles with a perimeter of 12 cm each.
9. The perimeter of square A is 4 metres. Two same squares make a rectangle B. Baraka and Neema calculated the perimeter of the rectangle B. Baraka got a perimeter of 8 metres, while Neema got 6 metres. Who got the correct answer? Give reason.



10. A pupil bought a 28 m wire mesh which covered all the sides of a chicken house. If the length of the chicken house is 10 m, what is its width?

11. The perimeter of a square is 36 cm.

(a) Explain the steps to find the length of each side.

(b) If the square has to be changed into a rectangle which is 3 cm wide, what will be the length of the rectangle?

12. The perimeter of a rectangle is 42 metres. If its width is 7 metres, what is its length?.

13. The total length of two sides of a triangle is 48 cm. If the perimeter of this triangle is 69 cm, find the length of the third side.

14. Find the length of a square if its perimeter is 92 metres.

15. Furaha drew a square whose side is 7 cm long. What was its perimeter?

16. Musa drew a rectangle that was 8 cm long and 5 cm wide. What was its perimeter?

17. A tailor bought a cloth that was 2 metres long and 1 metre wide. What is its perimeter?

18. A carpet in the teachers' office has 7 metres long and 5 metres wide. Find its perimeter.

19. Shiloli ran round a football ground that is 100 metres long and 70 metres wide. What distance did she cover in two rounds?

20. The perimeter of a triangle is 23 cm. The length of the first side is 7 cm while the second one is 6 cm. What is the length of the third side?

Summary

1. A line segment has two points shown by a starting mark and an ending mark.
2. A ray has a mark at the starting point and an arrow at the endless point.
3. A straight line is formed by extending a line segment in both direction endlessly.
4. A perimeter is the distance around a figure.

Chapter Thirteen

Statistics

Introduction

In Standard Three, you learnt on how to use statistics to represent various information. In this chapter, you will learn how to collect and record, and represent information by using pictograms and bar charts. This competence will help you to collect and interpret information such as the amount of rainfall, population growth, health services and harvests.

Exercise 1: Revision

Study the pictogram which shows the daily sales of fish in one week at Mwananchi fish market and answer the questions that follow:

Days	Number of fish sold
Monday	
Tuesday	
Wednesday	
Thursday	
Friday	
Saturday	
Sunday	

1. How many fish were sold on Monday?
2. How many fish were sold on Saturday?
3. How many fish were sold in a week?
4. What is the difference of fish sales between Monday and Sunday?
5. Which day has the lowest fish sales?
6. Which day has the highest fish sales?
7. Which days have equal fish sales?
8. Write the number of fish sold on:
   (a) Thursday
   (b) Wednesday
   (c) Friday

Collecting and recording data

Collected and recorded information are called data. Data can be interpreted by using bar charts or pictograms.

Representation of data by pictograms

Pictograms are used to represent collected data. One picture of an object can be used to represent a number of objects. Any picture can be used to represent a number of objects.

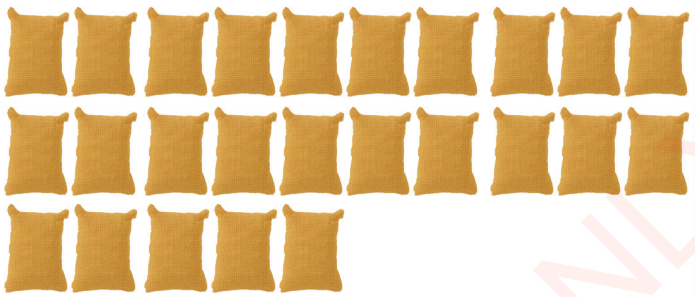
Example

In 2014, farmers in Kalenga village harvested maize, beans, potatoes and millet as shown in the following table. Draw a picture of sacks to represent this information.

Key: 1 sack represents 1 000 sacks.

Crops	Number of sacks
Maize	25 000
Beans	14 000
Potatoes	30 000
Millet	8 000

Answer

Crops	Number of sacks	Number of sacks by pictures
Maize	25	
Beans	14	
Potatoes	30	
Millet	8	

Exercise 2

Fill in the blanks. The first row is done as an example.

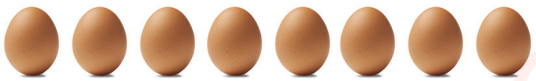
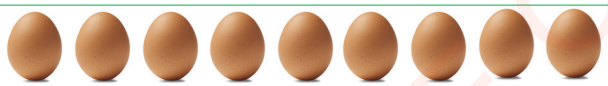
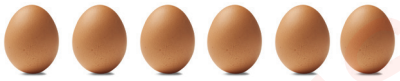
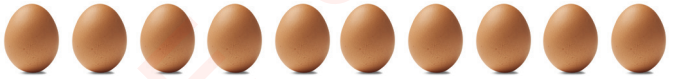
	Total	Pictograms	Key
1.	15 000 trees		1 tree picture represents 1 000 trees.
2.	11 000 eggs		1 egg picture represents 1 000 eggs.
3.	200 boxes		1 box picture represents 100 boxes.
4.	40 000 sacks of peanuts		1 sack picture represents 10 000 sacks.
5.	80 000 oranges		1 orange picture represents 10 000 oranges.
6.	50 water bottles		1 water bottle picture represents 10 water bottles.

Using pictures to get the number of objects

Example

Mary collected eggs as shown in the following table:

Key: 1 picture represents 50 eggs.

Days	Number of eggs
Monday	
Tuesday	
Wednesday	
Thursday	
Friday	
Saturday	
Sunday	

Questions

(a) Which day did Mary collect the largest number of eggs?

(b) How many eggs were collected on Tuesday?

(c) What is the total number of eggs collected in a week?

Solution

(a) Mary collected many eggs on Friday.

(b) The eggs collected on Tuesday are obtained as follows:

9 x 50 eggs = 450 eggs.

Therefore, on Tuesday she collected 450 eggs.

(c) Eggs collected in a week:

The total number of eggs pictures
= 8 + 9 + 6 + 7 + 10 + 7 + 4
= 51

But, 1 picture represents 50 eggs.

The total number of eggs collected

= 51 x 50 eggs = 2 550 eggs.

Therefore, Mary collected 2 550 eggs in that week.

Exercise 3

1. Study the pictogram and answer the questions that follow:

The triangles in the following table represent sales of millet per month at Amani's shop.

Months	Sales in kilograms
June	
July	
August	
September	
October	

Questions

Key: 1 triangle represents 1 000 kilograms

(a) Which month has the lowest sales of millet?

(b) How many kilograms of millet were sold in August?

(c) What is the difference of millet sales in kilograms between September and October?

2. Use information from the following table to draw a pictogram to show the total number of pupils in each school.

Key: 1 picture represents 100 pupils.

Schools	Number of pupils
Umoja	800
Minazini	1 200
Mwenge	900
Kilimani	1 000
Juhudi	600

Representation of data by bar charts

A bar chart is used to represent collected and recorded data. The bar chart is a diagram consisting of bars whose heights represent the number of objects in each category.

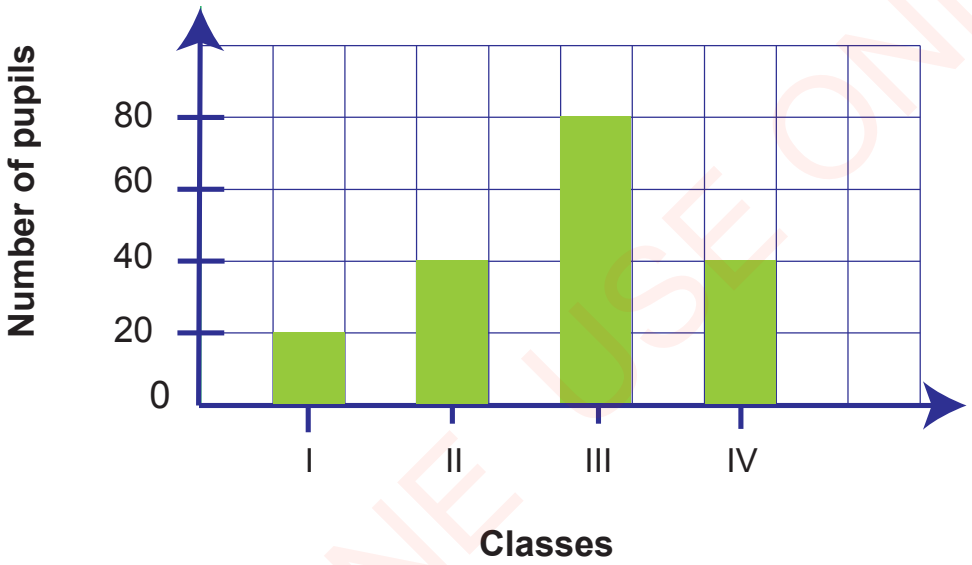
In order to draw a bar chart, consider the following:

(a) The heights of bars represent total number of objects or items.
(b) The widths of bars must be equal.
(c) Equal spaces must be left between the bars.
(d) The length of the bar depends on data point on the vertical axis.
(e) The bar chart must have a heading.

Example 1

Study the bar chart representing the number of pupils in Class I – IV at Mwenge Primary School and then answer the questions that follow:

A pictogram showing the number of pupils in Class I – IV at Mwenge Primary School



Scale: Horizontal: 1 cm represents 1 class
Vertical: 1 cm represents 20 pupils

Questions

1. What do the vertical line represents?
2. What do the horizontal line represents?
3. How many pupils are in Class I?
4. Which class has the highest number of pupils?
5. Which classes have equal number of pupils?

Answers

1. Vertical line represents number of pupils.
2. Horizontal line represents classes.
3. Class I has 20 pupils.
4. Class III has the highest number of pupils.
5. Classes II and IV have equal number of pupils.

Activity

Collect and arrange books as follows:

Name of the books	Number of books
Mathematics	18
Kiswahili	14
English	10
Social studies	20

Questions

1. Which arrangement of the book is longer than others?
2. Which arrangement of the book is shorter than others?
3. Draw a bar chart to represent arrangement of the books?

Example 2

Study the attendance of Standard Four pupils at Mashujaa Primary School and answer the questions that follow:

Day	Monday	Tuesday	Wednesday	Thursday	Friday
Number of pupils	90	120	70	60	110

Questions

(a) Draw a bar chart to represent the class attendance from Monday to Friday.

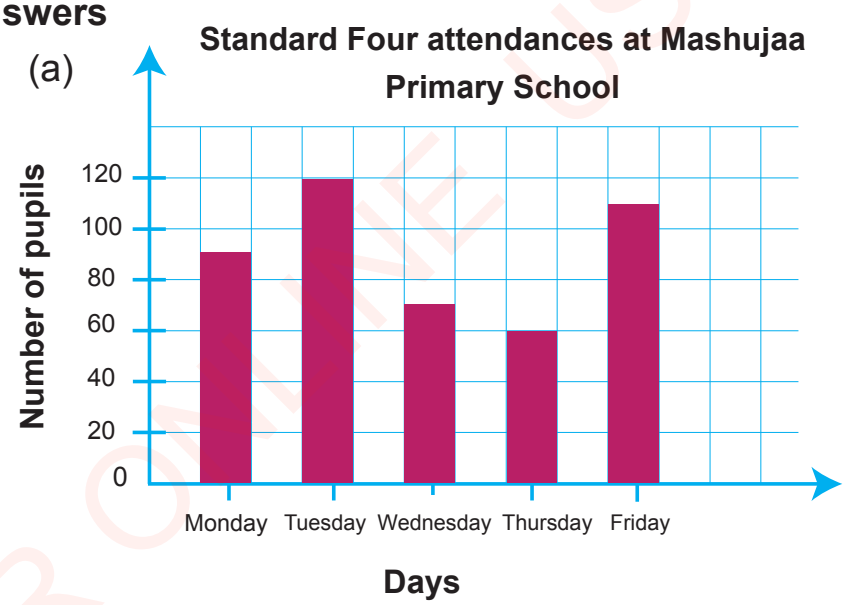
(b) From the bar chart, state the day attended by:

(i) highest number of pupils.

(ii) lowest number of pupils.

Answers

(a)



Scale: Horizontal: 1 cm represents one day

Vertical: 1 cm represents 20 pupils

(b) (i) Tuesday had highest number of pupils attended.

(ii) Thursday had a lowest number of pupils attended.

Exercise 4

1. Maimuna harvested some maize as shown in the following pictogram. Study the pictogram and answer the questions that follow:

Year	Number of sacks of maize
2012	
2013	
2014	
2015	

Key: 1 picture of sack represents 2 sacks of maize.

Questions

(a) Represent the above information using a bar chart..

(b) Which year had the longest bar?

(c) What is the difference between the sacks of maize harvested in 2012 and 2015?

2. The marks of 6 standard four pupils in a Mathematics test are shown in the following table:

Pupils	Marks
Bakari	85
Amani	60
Neema	90
Shukuru	40
Ashura	80
Bahati	60

Scale: Vertical: 1 cm represent 10 marks
Horizontal: 1 cm represent 1 width of bar

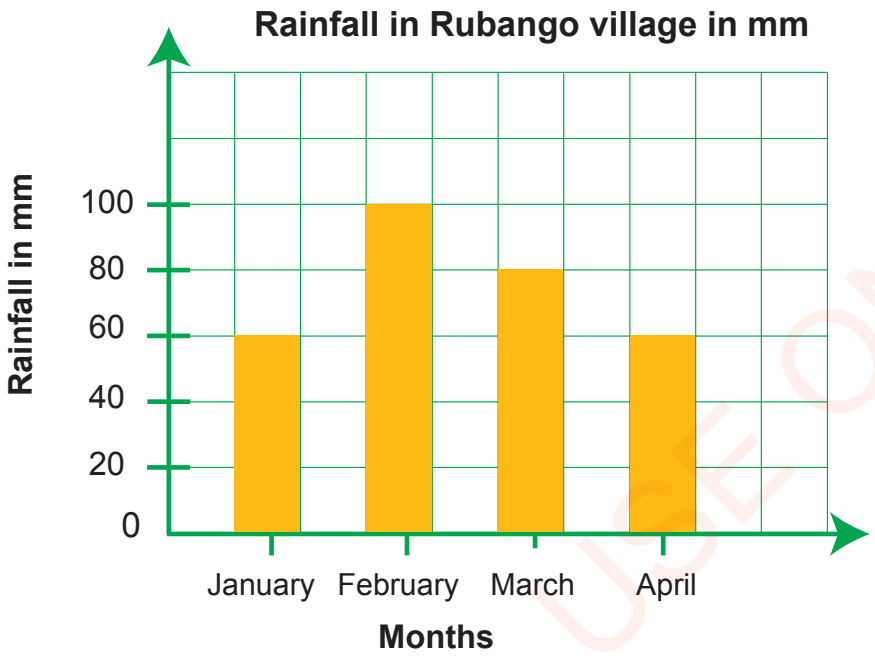
Questions

(a) Which bar is the longest?

(b) Find the difference between the shortest and the longest bar.

(c) State the names of the pupils whose bars have equal length.

3. Study the following bar chart which shows rainfall from January to April. Use the bar chart to answer the questions that follow:



Scale: Horizontal: 1 cm represents one month
Vertical: 1 cm represents 20 mm of rainfall.

Questions

(a) Which month had the highest rainfall?

(b) Which months had equal amounts of rainfall?

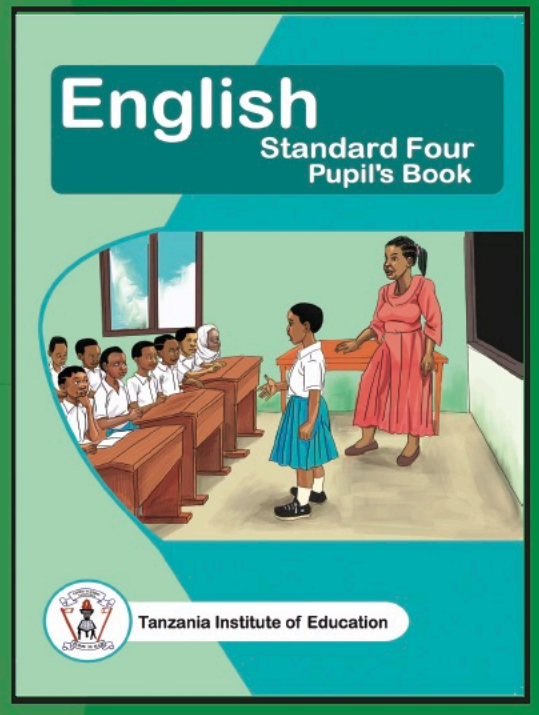
(c) What is the amount of rainfall in March?

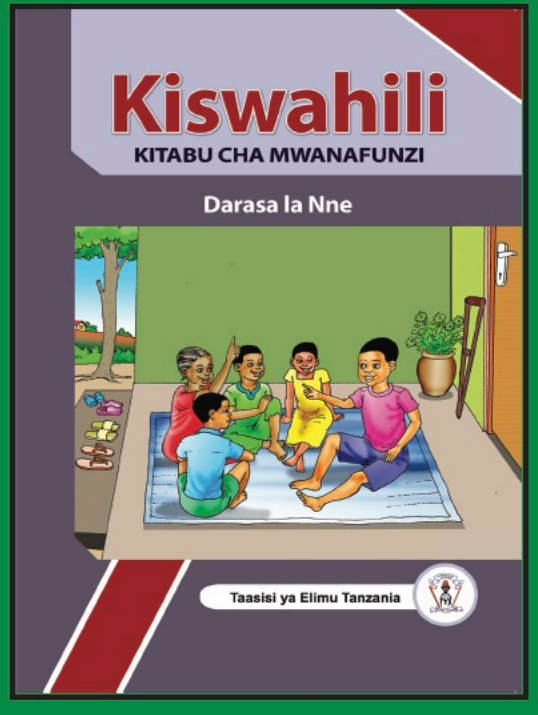
Summary

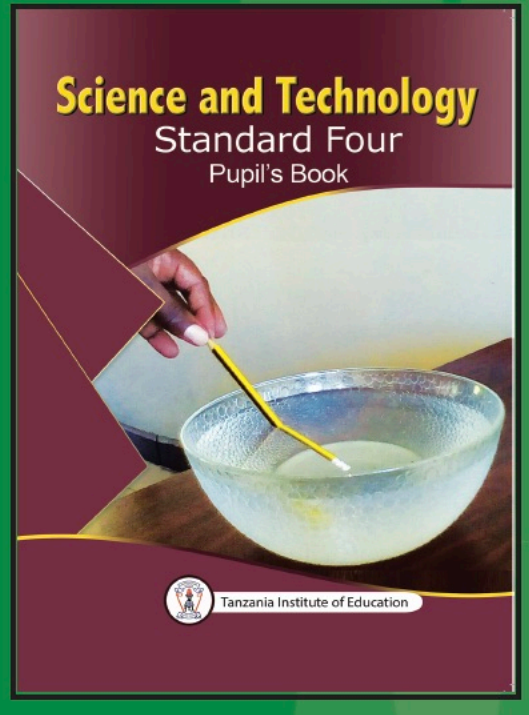
1. Pictograms are used to represent collected data.
2. Collected data is represented by pictograms and bar charts.

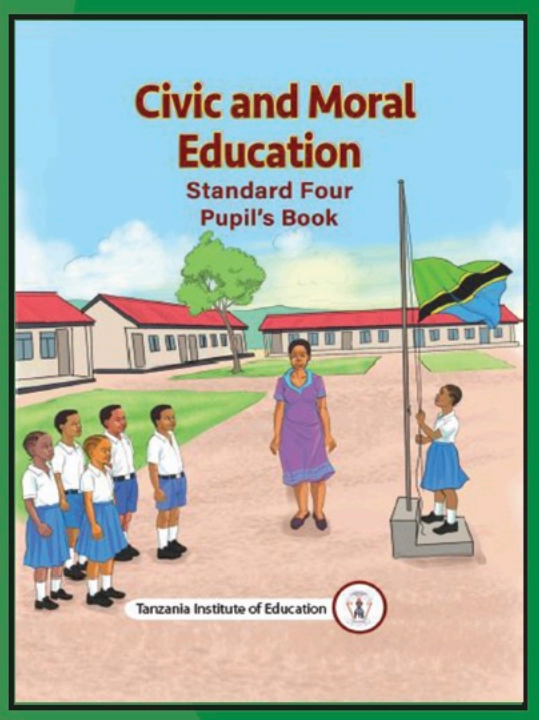
Other Books by
Tanzania Institute of Education

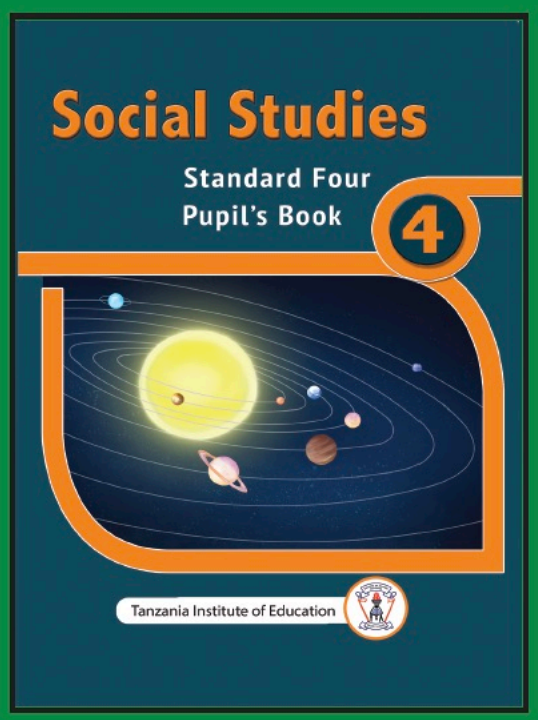
Standard Four

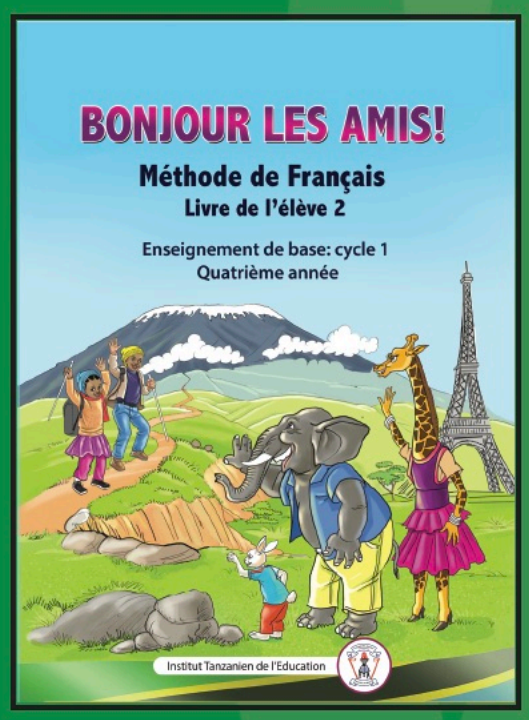












ISBN 978-9987-09-117-1

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