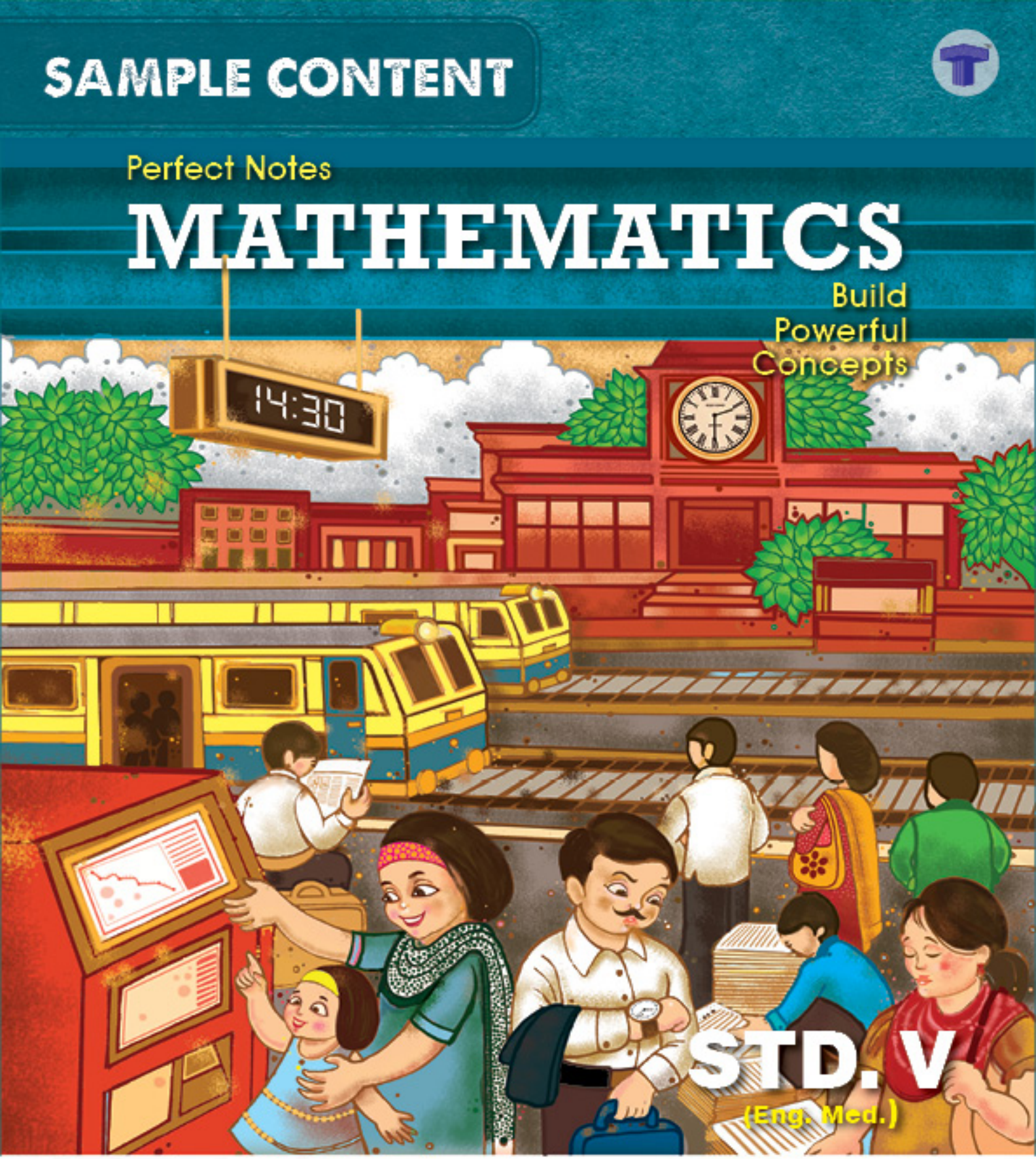
SAMPLE CONTENT

Perfect Notes

MATHEMATICS

Build Powerful Concepts



STD. V

(Eng. Med.)

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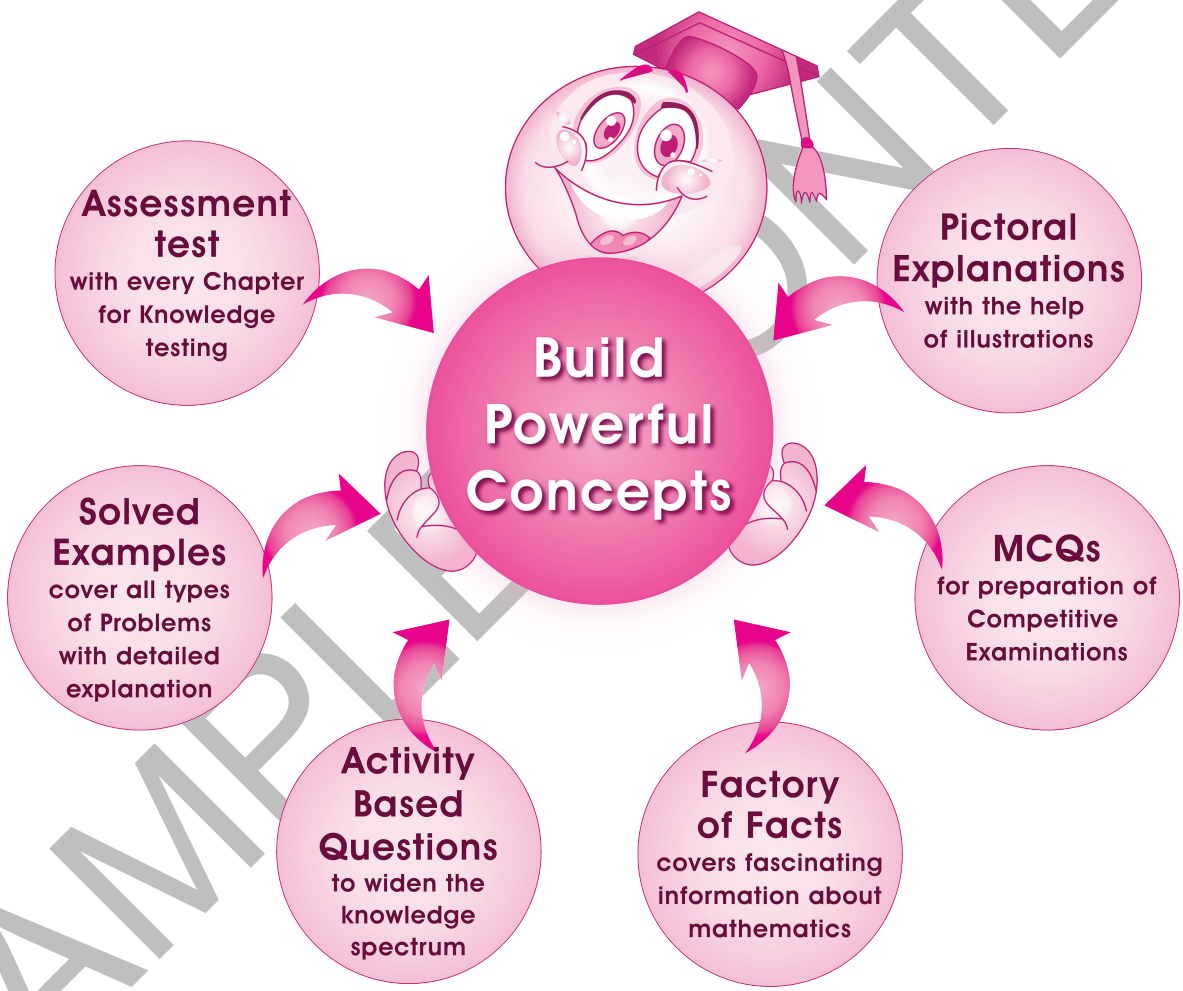
STD. V

Mathematics



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PREFACE

Preparing this Mathematics book was a rollercoaster ride. We had a plethora of ideas, suggestions and decisions to ponder over. However our basic premise was to keep this book in line with the new, improved syllabus and provide students with an absolutely fresh material.

To begin with, let us look at this book as a 'powerful concept building tool'. We want this book to act as a facilitator for students to deeply understand mathematical concepts presented in the class V book by the Maharashtra State Education Board. The understanding of these concepts would eventually help students, link textual problems with their daily life and comprehend its application for future use.

We've ensured that every chapter begins with a lucid introduction to the topic. Thereon the chapter covers a multitude of solved examples related to the topic. These examples are textual as well external practice problems, so as to reinforce the topic's understanding within the reader.

The part of Formative Assessment covers Activity Based Questions from the textbook. We've partially solved these questions and added additional ones for practice sake.

Every chapter ends with an Assessment Test. This test stands as a testimony to the fact that the child has understood the chapter thoroughly. The Multiple Choice Questions included in this test facilitate students to prepare for competitive examinations.

To conclude the chapter we've presented a snippet of interesting mathematical concepts in the form of Factory of Facts. This enhances the student's knowledge beyond the textbook material.

With absolute trust in our work, we hope, our holistic efforts towards making this book are paid off if students understand mathematics conceptually rather than just focusing on the problem solving part. This text would definitely act as a reference point for the same.

The journey to create a complete book is strewn with triumphs, failures and near misses. If you think we've nearly missed something or want to applaud us for our triumphs, we'd love to hear from you.
Please write to us on : mail@targetpublications.org

A book affects eternity; one can never tell where its influence stops.

Best of luck to all the aspirants!

From,

Publisher

Edition: Second

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1. Roman Numerals

Introduction:
In ancient Europe, people used some capital Roman letters to write numbers. Hence these numerals were known as Roman numerals. In this chapter, we will learn to write Roman numerals from 1 to 20.
We see the use of Roman numerals in several clocks and watches, ancient European coins, books etc.

Summative Assessment

Let's Study

Symbols used for writing Roman numerals

The three basic symbols used to write Roman numerals are given in the table below:

Symbol used as Roman numeral	I	V	X
Numeric value represented by it	1	5	10

*[**Note:** (1) There is no symbol for zero in Roman numerals.*
(2) The value of a symbol used for Roman numeral does not change with its place.]

Rules for writing Roman numerals

The rules for writing numbers from 1 to 20 using the Roman numerals are as follows:

Rule 1: The number formed by writing the symbols I or X consecutively two or three times is the sum of the numeric values of the individual symbols.
Examples: II = 1 + 1 = 2, III = 1 + 1 + 1 = 3, XX = 10 + 10 = 20

Rule 2: The consecutive repetition of symbols I and X is allowed for a maximum of three times to form a number. However, the symbol V is never repeated.
Examples:
(1) III = 3, however IIII ≠ 4 (2) XXX = 30, however XXXX ≠ 40
(3) VV ≠ 10 and VVV ≠ 15.

Rule 3: When either I or V is written on the right side of the symbol of a bigger number, add its value to the value of the bigger number.
Examples: VI = 5 + 1 = 6, XI = 10 + 1 = 11, XV = 10 + 5 = 15
VII = 5 + 2 = 7, XII = 10 + 2 = 12, XVI = 10 + 5 + 1 = 16
VIII = 5 + 3 = 8, XIII = 10 + 3 = 13

Rule 4: When I is written on the left of V or X, subtract its value (i.e. 1) from the value of V or X.
Examples: IV = 5 – 1 = 4, IX = 10 – 1 = 9

SAMPLE CONTENT

Note:

1. *The symbol I cannot be used more than three times, after a bigger number.*
   Examples:
   (1) The number 14 is not written as XIIII. Instead it is written as XIV.
   (2) Similarly, 19 is not written as XVIIII. Instead it is written as XIX.

2. *The symbol I cannot be written more than once before V or X.*
   Examples:
   (1) 3 cannot be written as IIV. Instead it is written as III.
   (2) 8 cannot be written as IIX. Instead it is written as VIII.

3. *To write any number from 1 to 20 in Roman numeral, it is first distributed into groups of 10, 5 and 1. Then the above four rules are applied as shown below:*
   (1) 7 = 5 + 1 +1 = VII
   (2) 8 = 5 + 1 + 1 + 1 = VIII
   (3) 12 = 10 + 1 + 1 = XII
   (4) 13 = 10 + 1 + 1 + 1 = XIII
   (5) 16 = 10 + 5 + 1 = XVI
   (6) 17 = 10 + 5 + 1 + 1 = XVII

Let's Practise : Problem Set 1

1. Write all the numbers from 1 to 20 using Roman numerals.

Ans:

Number	1	2	3	4	5	6	7	8	9	10
Roman numerals	**I**	**II**	**III**	**IV**	**V**	**VI**	**VII**	**VIII**	**IX**	**X**

Number	11	12	13	14	15	16	17	18	19	20
Roman numerals	**XI**	**XII**	**XIII**	**XIV**	**XV**	**XVI**	**XVII**	**XVIII**	**XIX**	**XX**

2. Write the following numbers using international numerals.

(1) V (2) VII (3) X (4) XIII
(5) XIV (6) XVI (7) XVIII (8) IX

Ans:

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Roman numerals	V	VII	X	XIII	XIV	XVI	XVIII	IX
International numerals	**5**	**7**	**10**	**13**	**14**	**16**	**18**	**9**

3. Fill in the empty boxes.

Number	Three		Six		Fifteen	
Roman numerals		VIII		XII		XIX

Ans:

Number	Three	**Eight**	Six	**Twelve**	Fifteen	**Nineteen**
Roman numerals	**III**	VIII	**VI**	XII	**XV**	XIX

4. Write the numbers using Roman numerals.

(1) 9 ☐ (2) 2 ☐ (3) 17 ☐
(4) 4 ☐ (5) 11 ☐ (6) 18 ☐

Ans: (1) 9 **IX** (2) 2 **II** (3) 17 **XVII**
(4) 4 **IV** (5) 11 **XI** (6) 18 **XVIII**

SAMPLE CONTENT

5. In the table below, each given number is written in international numerals and then again in Roman numerals. If it is written correctly in Roman numerals, put '✓' in the box under it. If not, put '✗' and correct it.

International numerals	4	6	8	16	15
Roman numerals	IIII	VI	IIX	XVI	VVV
Right / Wrong (If wrong, correct the numeral)					

Ans:

International numerals	4	6	8	16	15
Roman numerals	IIII	VI	IIX	XVI	VVV
Right / Wrong	✗	✓	✗	✓	✗
Corrected Roman numerals	**IV**	**–**	**VIII**	**–**	**XV**

Something more

1. Roman numerals greater than 20:

The symbols L, C, D and M are also used as Roman numerals for greater numbers as shown below.

Roman numerals	I	V	X	L	C	D	M
International numerals	1	5	10	50	100	500	1000

2. The decimal system of writing numbers:

The system of reading and writing numbers using the ten digits, 0 to 9 is known to us. This system is known as the 'decimal system'.

In the decimal system, the value of a digit depends upon its place in the number.

The decimal system of writing numbers was invented by mathematicians of ancient India. It was later accepted in all parts of the world because it was simple and convenient.

Formative Assessment

Activity

1. Apart from clocks and watches, where else do we see Roman numerals? (Textbook pg. no. 2)

Ans: Apart from clocks and watches, Roman numerals are also used as follows:

(1) In several books to denote the chapter number.

Examples: Chapter I: Roman Numerals
Chapter II: Number Work

(2) In formal titles or names.

Examples: Pope John Paul II, King Louis XIV, Queen Elizabeth I, etc.

(3) To denote the class or standard in which one is studying.

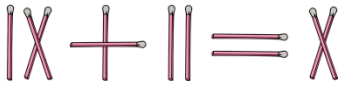
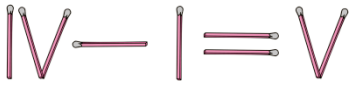
Examples: Standard I, standard V, etc.

(4) Occurrence of recurring grand event.

Example: Games of the XXXI Olympiad (Rio 2016 Summer Olympics)

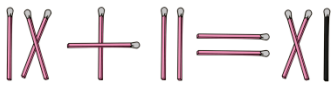
SAMPLE CONTENT

2. In each of the following add one matchstick to correct the equalities involving Roman numerals.

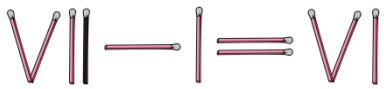
(1)  (2) 

(3) (4)

Ans:

(1)  (2)

(3) Or

(4) 

Assignment Test

1. Write the following numbers using Roman numerals:

(1) 3 (2) 10 (3) 12 (4) 17

2. Write the following numbers using international numerals:

(1) II (2) IX (3) XIII (4) XIX

3. Match the following:

	Number		Roman Numerals
(1)	Six	(a)	IV
(2)	Fourteen	(b)	VI
(3)	Eight	(c)	V
(4)	Sixteen	(d)	XIV
(5)	Five	(e)	VIII
(6)	Four	(f)	XVI

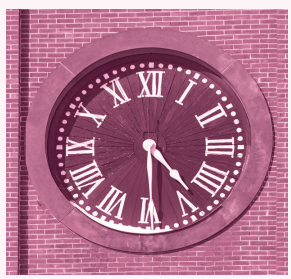
Answers:

1. (1) III (2) X (3) XII (4) XVII
2. (1) 2 (2) 9 (3) 13 (4) 19
3. (1) – (b), (2) – (d), (3) – (e), (4) – (f), (5) – (c), (6) – (a)

Factory of Facts:

In most of the tower clocks, we can see 4 written as IIII. Until modern time, 4 was written as IIII in Roman numerals.

The best known theory which explains it is that the name of Roman's supreme deity Jupiter is spelled as IVPPITER in Latin and abbreviated as IV. The Romans were hesitant to put God's name on a sundial or in accounting books. Thus, IIII became the preferred representation of 4.



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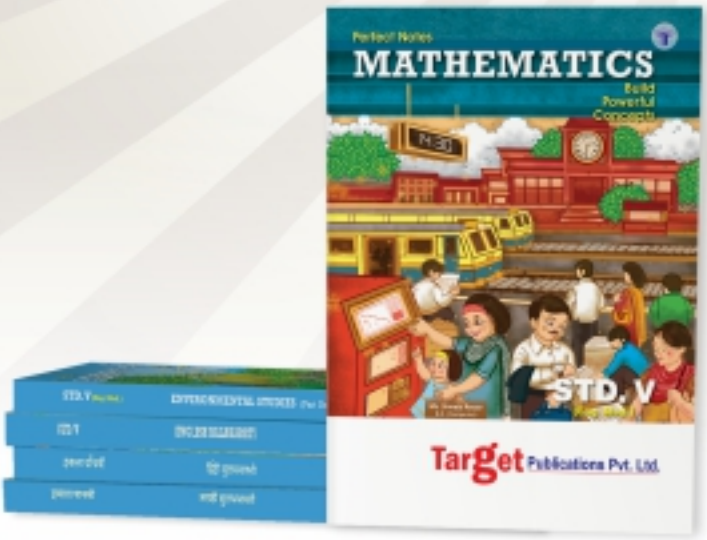
Std. V



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