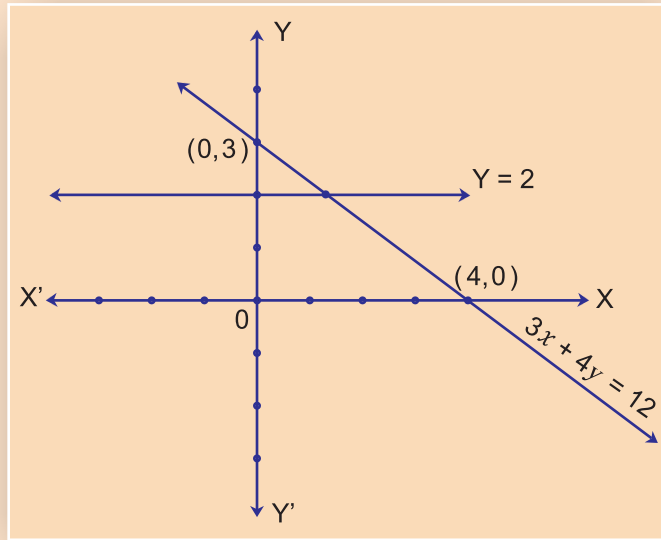




Mathematics

Part-I

STANDARD TEN



$$\begin{aligned}
 &1 + 2 + 3 + \dots + \dots + \dots + 78 + 79 + 80 \\
 &= (1 + 80) + (2 + 79) + \dots + (39 + 42) + (40 + 41)
 \end{aligned}$$

The Constitution of India

Chapter IV A

Fundamental Duties

ARTICLE 51A

Fundamental Duties- It shall be the duty of every citizen of India—

- (a) to abide by the Constitution and respect its ideals and institutions, the National Flag and the National Anthem;
- (b) to cherish and follow the noble ideals which inspired our national struggle for freedom;
- (c) to uphold and protect the sovereignty, unity and integrity of India;
- (d) to defend the country and render national service when called upon to do so;
- (e) to promote harmony and the spirit of common brotherhood amongst all the people of India transcending religious, linguistic and regional or sectional diversities, to renounce practices derogatory to the dignity of women;
- (f) to value and preserve the rich heritage of our composite culture;
- (g) to protect and improve the natural environment including forests, lakes, rivers and wild life and to have compassion for living creatures;
- (h) to develop the scientific temper, humanism and the spirit of inquiry and reform;
- (i) to safeguard public property and to abjure violence;
- (j) to strive towards excellence in all spheres of individual and collective activity so that the nation constantly rises to higher levels of endeavour and achievement;
- (k) who is a parent or guardian to provide opportunities for education to his child or, as the case may be, ward between the age of six and fourteen years.

The Coordination Committee formed by GR No. Abhyas - 2116/(Pra.Kra.43/16) SD - 4
Dated 25.4.2016 has given approval to prescribe this textbook in its meeting held on
29.12.2017 and it has been decided to implement it from the educational year 2018-19.

Mathematics

Part I

STANDARD TEN



**Maharashtra State Bureau of Textbook Production and
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The digital textbook can be obtained through DIKSHA App on a smartphone by using the Q. R. Code given on title page of the textbook and useful audio-visual teaching-learning material of the relevant lesson will be available through the Q. R. Code given in each lesson of this textbook.

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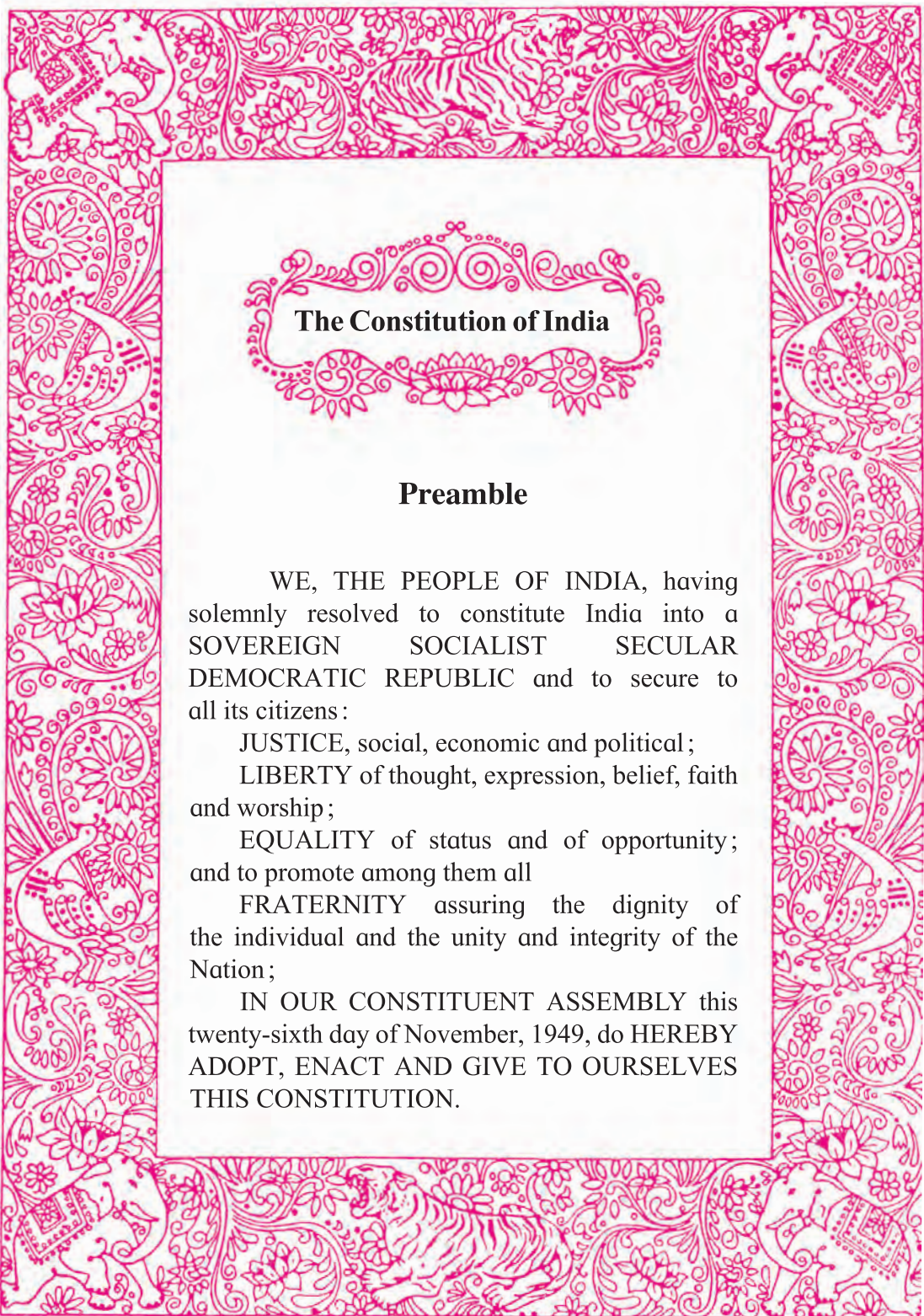
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The Constitution of India

Preamble

WE, THE PEOPLE OF INDIA, having solemnly resolved to constitute India into a SOVEREIGN SOCIALIST SECULAR DEMOCRATIC REPUBLIC and to secure to all its citizens :

JUSTICE, social, economic and political ;

LIBERTY of thought, expression, belief, faith and worship ;

EQUALITY of status and of opportunity ; and to promote among them all

FRATERNITY assuring the dignity of the individual and the unity and integrity of the Nation ;

IN OUR CONSTITUENT ASSEMBLY this twenty-sixth day of November, 1949, do HEREBY ADOPT, ENACT AND GIVE TO OURSELVES THIS CONSTITUTION.

NATIONAL ANTHEM

Jana-gana-mana-adhināyaka jaya hē
Bhārata-bhāgya-vidhātā,

Panjāba-Sindhu-Gujarāta-Marāthā
Drāvida-Utkala-Banga

Vindhya-Himāchala-Yamunā-Gangā
uchchala-jaladhi-taranga

Tava subha nāmē jāgē, tava subha āsisa māgē,
gāhē tava jaya-gāthā,

Jana-gana-mangala-dāyaka jaya hē
Bhārata-bhāgya-vidhātā,

Jaya hē, Jaya hē, Jaya hē,
Jaya jaya jaya, jaya hē.

PLEDGE

India is my country. All Indians
are my brothers and sisters.

I love my country, and I am proud
of its rich and varied heritage. I shall
always strive to be worthy of it.

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

To my country and my people,
I pledge my devotion. In their
well-being and prosperity alone lies
my happiness.

Preface

Dear Students,

Welcome to the tenth standard!

This year you will study two text books - Mathematics Part-I and Mathematics Part-II

The main areas in the book Mathematics Part-I are Algebra, Graph, Financial planning and Statistics. All of these topics were introduced in the ninth standard. This year you will study some more details of the same. The new tax system, GST is introduced in Financial planning. Wherever a new unit, formula or application is introduced, its lucid explanation is given. Each chapter contains illustrative solved examples and sets of questions for practice. In addition, some questions in practice sets are star-marked, indicating that they are challenging for talented students. After tenth standard, some students do not opt for Mathematics. This book gives them basic concepts and mathematics needed to work in other fields. The matter under the head 'For more information' is useful for those students who wish to study mathematics after tenth standard and achieve proficiency in it. So they are earnestly advised to study it. Read the book thoroughly at least once and understand the concepts.

Additional useful audio-visual material regarding each lesson will be available to you by using Q.R. code through 'App'. It will definitely be useful to you for your studies.

Much importance is given to the tenth standard examination. You are advised not to take the stress and study to the best of your ability to achieve expected success. Best wishes for it !



(Dr. Sunil Magar)

Director

Pune

Date : 18 March 2018, Gudhipadva

Indian Solar Year : 27 Falgun 1939

Maharashtra State Bureau of Textbook
Production and Curriculum Research, Pune.

It is expected that students will develop the following competencies after studying Mathematics– Part I syllabus in standard X

Area	Topic	Competency Statements
1. Knowledge of numbers	1.1 Arithmetic Progression	The students will be able to- • solve examples using Arithmetic Progression. • plan steps to achieve a goal in future.
2. Algebra	2.1 Quadratic Equations 2.2 Linear equations in two variables	• solve day to day problems which can be expressed in the form of quadratic equations. • decide the number of variables required to find solutions of word problems. • convert a word problem into an equation in two variables and find its solution.
3. Commercial Mathematics	3.1 Financial planning	• understand the concepts of savings and investments. • get familiar with financial transactions in business, profession etc.
4. Statistics and Probability	4.1 Probability 4.2 Graph and measures of central tendencies	• use the concept of probability in games, voting etc. • present the collected data in the form of graphs or pictures deciding the suitable form of presentation. • find the mean, median and mode of a provided classified data.

Instructions for Teachers

Read the book in detail and understand the content thoroughly. Take the help of activities to explain different topics, to verify the formulae etc.

Practicals is also a means of evaluation. Activities given can also be used for this purpose. Encourage the students to think independently. Compliment a student if he solves an example by a different and logically correct method.

List of some practicals (Specimen)

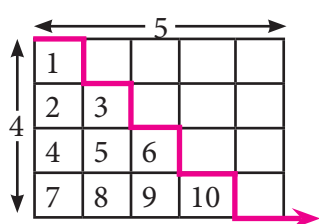
1. On a graph paper, draw a line parallel to the X-axis or Y-axis. Write coordinates of any four points on the line. Write how the equation of the line can be obtained from the coordinates.

[Instead of parallel lines, lines passing through the origin or intersecting the X or Y- axis can also be considered]

2. Bear a two- digit number in mind. Without disclosing it, construct a puzzle. Create two algebraic relations between the two digits of the number and solve the puzzle.

[The above practical can be extended to a three-digit number also.]

3. Read the information about contents on a food packet. Show the information by a pie diagram. For example, see the chart of contents like carbohydrates, proteins, vitamins etc. per given weight on a biscuit packet. Show the proportion of the contents by a pie diagram. The contents can be divided into four classes as carbohydrates, proteins, fats and others.
4. Prepare a frequency distribution table given by the teacher in Excel sheet on a computer. From the table draw a frequency polygon and a histogram in Excel.
5. Roll a die ten times and record the outcomes in the form of a table.
6. Observe the tax invoice given by your teacher. Record all of its contents. Recalculate the taxes and verify their correctness.
7. Calculate the sum of first n natural numbers given by your teacher through the following activity. For example to find the sum of first four natural numbers, take a square-grid piece of paper of 4×5 squares. Then cut it as shown in the figure. Hence verify the formula $S_n = \frac{n(n+1)}{2}$ (Here $n = 4$)



$$S_n = \frac{n(n+1)}{2} \quad \therefore S_4 = \frac{4(4+1)}{2} = \frac{4 \times 5}{2} = \frac{20}{2} = 10$$

[Note: Here $a = 1$ and $d = 1$. The activity can be done taking different values of a and d . Similarly, you can find the sum of even or odd numbers, cubes of natural numbers etc.]

8. Write $\alpha = 6$ on one side of a card sheet and $\alpha = -6$ on its backside. Similarly, write $\beta = -3$ on one side of another card sheet and $\beta = 7$ on its backside. From these values, form different values of $(\alpha + \beta)$ and $(\alpha\beta)$; using these values form quadratic equations.

INDEX

Chapters	Pages
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