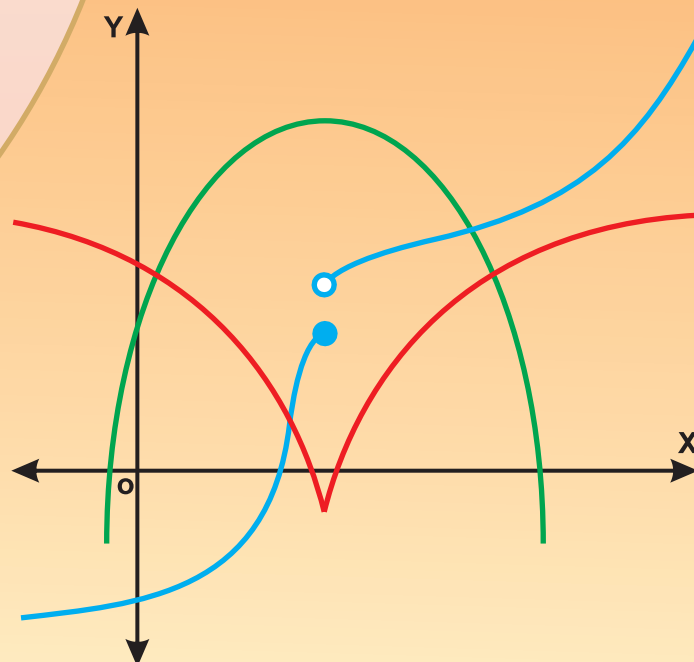
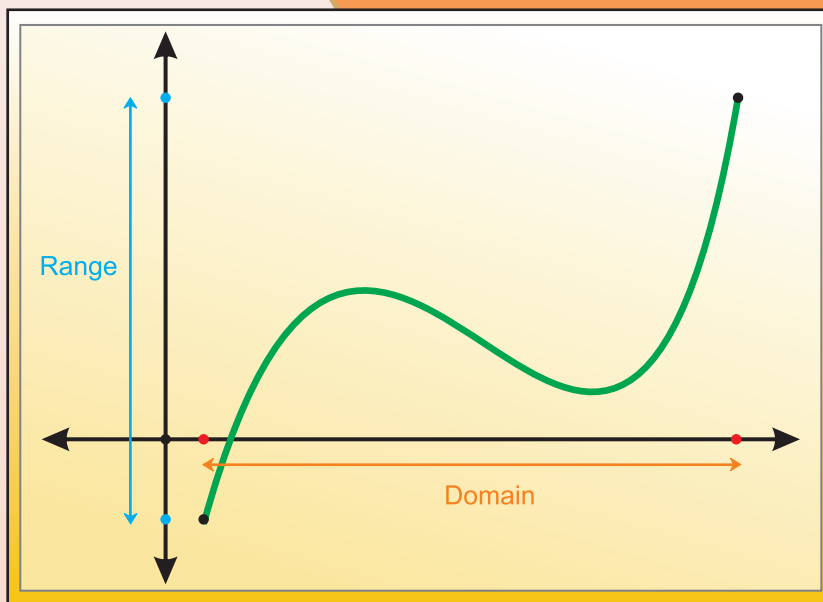


Standard XI



Mathematics & Statistics

(Arts & Science) Part 2



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
20.06.2019 and it has been decided to implement it from the educational year 2019-20.

Mathematics and Statistics

(Arts and Science)

Part - 2

STANDARD - XI



**Maharashtra State Bureau of Textbook Production and Curriculum Research,
Pune - 411 004**



C1D3K5

Download DIKSHA App on your smartphone. If you scan the Q.R.Code on this page of your textbook, you will be able to access full text and the audio-visual study material relevant to each lesson provided as teaching and learning aid.

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Second Reprint : 2021 and Curriculum Research, Pune- 411 004.**

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Paper

70 GSM Cream wove

Print Order No.

N/PB/2021-22/1,00,000

Printer

ORIENT PRINTERS, MUMBAI

Publisher

Vivek Uttam Gosavi, Controller
Maharashtra State Textbook Bureau,
Prabhadevi Mumbai- 400 025



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 eleventh standard!

You have successfully completed your secondary education and have entered the higher secondary level. You will now need to learn certain mathematical concepts and acquire some statistical skills to add more applicability to your work. Maharashtra State Bureau of Textbook Production and Curriculum Research has modified and restructured the curriculum in Mathematics in accordance with changing needs.

The curriculum of Mathematics is divided in two parts. Part 1 covers topics in Trigonometry, Algebra, Co-ordinate Geometry and Statistics. Part 2 covers Complex Numbers, Sets and Relations, Calculus and Combinatorics. There is a special emphasis on applications. Activities are added in chapters for creative thinking. Some material will be made available on E-balbharati website (e-balbharati.in). It contains a list of specimen practical problems on each chapter. Students should complete the practical exercises under the guidance of their teachers. Maintain a journal and take teacher's signature on every completed practical.

You are encouraged to use modern technology in your studies. Explore the Internet for more recent information on topics in the curriculum. Get more examples and practice problems from the Internet. You will enjoy learning if you study the textbook thoroughly and manage to solve problems.

On the title page Q.R. code is given. It will help you to get more knowledge and clarity about the contents.

This textbook is prepared by Mathematics Subject Committee and members of study group. This book has also been reviewed by senior teachers and subject experts. The Bureau is grateful to all of them and would like to thank for their contribution in the form of creative writing, constructive criticism, and valuable suggestions in making this book useful to you and helpful to your teachers.

The Bureau hopes that the textbook will be received well by all stakeholders in the right spirit.

You are now ready to study. Best wishes for a happy learning experience.

Pune

Date : 20 June 2019

Indian Solar Date : 30 Jyeshtha 1941



(Dr. Sunil Magar)

Director

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

Mathematics and Statistics Std XI (Part II)
Arts and Science

| Sr. No | Area | Topic | Competency Statement |
|--------|--|----------------------------|---|
| 1 | Complex Numbers | Complex Numbers | The students will be able to - <ul style="list-style-type: none"> • understand set of complex numbers and different ways of expressing complex numbers. • perform algebraic operations on complex numbers. • simplify algebraic expressions involving complex numbers. |
| 2 | Sequences and Series | Sequences and Series | <ul style="list-style-type: none"> • Revise AP, learn GP and HP. • Find the general term and the sum of the first n terms of these sequences. |
| 3 | Permutations and combinations | Permutations, Combinations | <ul style="list-style-type: none"> • count the number of arrangements of given objects satisfying specific conditions. • count the number of possible selections of objects with certain conditions. |
| 4 | Method of Induction and Binomial theorem | Method of Induction | <ul style="list-style-type: none"> • understand the method of induction and apply it to verify mathematical statements. |
| | | Binomial Theorem | <ul style="list-style-type: none"> • expand binomial expressions and find its general term. • simplify the binomial expression for negative index or fractional power. |
| 5 | Sets and relations | Sets | <ul style="list-style-type: none"> • work with sets and operations on sets. • construct sets from given conditions. • solve problems on applications of set theory. |
| | | Relations | <ul style="list-style-type: none"> • identify the types of relations. • study equivalence relations. |

| | | | |
|---|-----------------|-----------------|--|
| 6 | Functions | Functions | <ul style="list-style-type: none"> • work with function defined on different domains. • identify different types of functions. • carry out algebraic operations on functions. |
| 7 | Limits | Limits | <ul style="list-style-type: none"> • understand the concept of limit of a function. • determine the limits of functions if they exist. |
| 8 | Continuity | Continuity | <ul style="list-style-type: none"> • Define and study the continuity of a function at a point and in an interval. |
| 9 | Differentiation | Differentiation | <ul style="list-style-type: none"> • understand and study the differentiability of a function. • understand and study differentiation of various functions. |

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