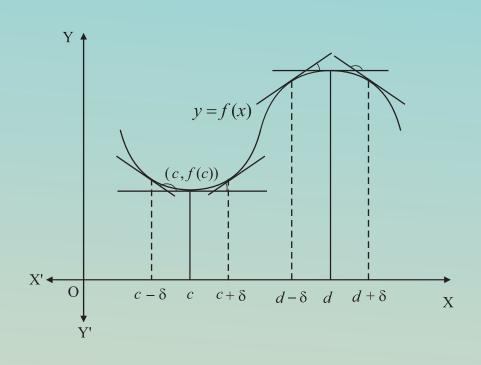
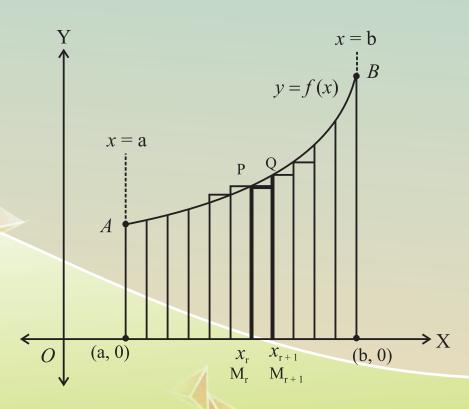


Mathematics & Statistics

Arts & Science Part 2

STANDARD XII





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;
- 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 30.01.2020 and it has been decided to implement it from the educational year 2020-21.

Mathematics and Statistics

(Arts and Science)

Part - II

STANDARD - XII



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



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First Edition: 2020 © Maharashtra State Bureau of Textbook Production First Reprint: 2021 and Curriculum Research, Pune- 411 004.

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Paper

70 GSM Cream wove

Print Order No.

N/PB/2021-22/70,000

Printer

NEAT PRINTS, AHMEDNAGAR

Layout & Typesetters

Smt. Nileema Khaladkar

Smt. Deepti Kharpas

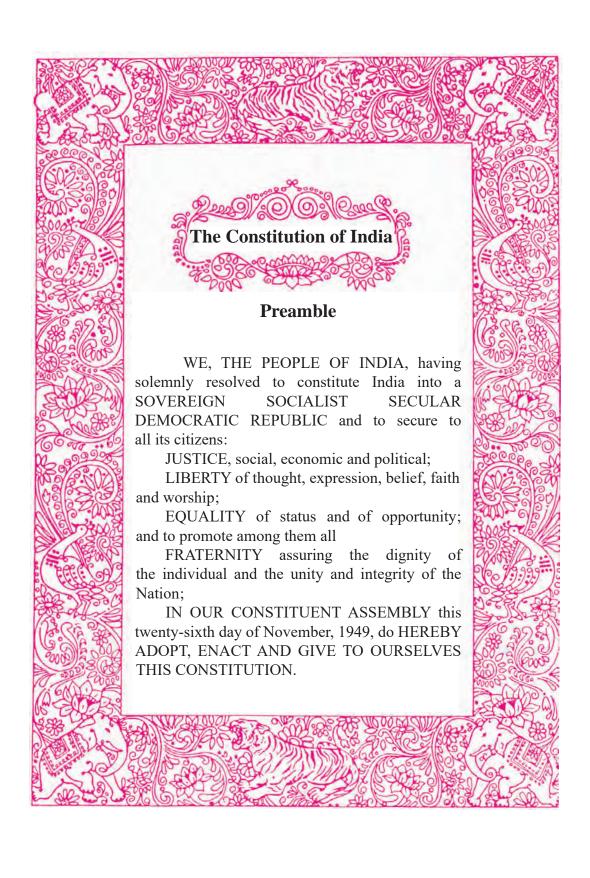
Samarth Graphics,

522, Narayan Peth, Pune 411 030.

Publisher

Vivek Uttam Gosavi, Controller

Maharashtra State Textbook Bureau, Prabhadevi Mumbai- 400 025



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 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 Standard XII, an important milestone in your life.

Standard XII or Higher Secondary School Certificate opens the doors of higher education. Alternatively, you can pursue other career paths like joining the workforce. Either way, you will find that mathematics education helps you considerably. Learning mathematics enables you to think logically, constistently, and rationally. The curriculum for Standard XII Mathematics and Statistics for Science and Arts students has been designed and developed keeping both of these possibilities in mind.

The curriculum of Mathematics and Statistics for Standard XII for Science and Arts students is divided in two parts. Part I deals with topics like Mathematical Logic, Matrices, Vectors and Introduction to three dimensional geometry. Part II deals with Differentiation, Integration and their applications, Introduction to random variables and statistical methods.

The new text books have three types of exercises for focused and comprehensive practice. First, there are exercises on every important topic. Second, there are comprehensive exercises at the end of all chapters. Third, every chapter includes activities that students must attempt after discussion with classmates and teachers. Additional information has been provided on the E-balbharati website (www.ebalbharati.in).

We are living in the age of Internet. You can make use of modern technology with the help of the Q.R. code given on the title page. The Q.R. code will take you to links that provide additional useful information. Your learning will be fruitful if you balance between reading the text books and solving exercises. Solving more problems will make you more confident and efficient.

The text books are prepared by a subject committee and a study group. The books (Paper I and Paper II) are reviewed by experienced teachers and eminent scholars. The Bureau would like to thank all of them for their valuable contribution in the form of creative writing, constructive and useful suggestions for making the text books valuable. The Bureau hopes and wishes that the text books are very useful and well received by students, teachers and parents.

Students, you are now ready to study. All the best wishes for a happy learning experience and a well deserved success. Enjoy learning and be successful.

Pune

Date: 21 February 2020

Bharatiya Saur : 2 Phalguna 1941

(Vivek Gosavi)

Director

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

Mathematics and Statistics XII (Part II) Arts and Science

Sr. No	Area / Topic	Sub Unit	Competency Statement
1.	Differentiation	Differentiation	 The students will be able to state and use standard formulas of derivative of standard functions use chain rule of derivatives find derivatives of the logarithm, implicit, inverse and parametric functions find second and higher order derivatives.
2.	Applications of Derivatives	Applications of Derivatives	 find equations of tangents and normal to a curve determine nature of the function-increasing or decreasing find approximate values of the function examine function for maximum and minimum values verify mean value theorems
3.	Indefinite Integration	Indefinite Integration	 understand the relation between derivative and integral use the method of substitution solve integrals with the help of integration by parts solve the integrals by the method of partial fractions
4.	Definite Integration	Definite Integration	 understand integral as a limit of sum the properties of definite integral state the properties of definite integral and use them to solve problems

5.	Application of Definite Integration	Application of Definite Integration	find the area under the curve, bounded by the curves using definite integrals.
6.	Differential Equation	Differential Equation	 form a differential equation and find its order and degree solve the first order and first degree differential equation by various methods apply the differential equations to study the polpulation, growth and decay in amount of substance and physics.
7.	Probability Distribution	Probability Distribution	 understand the random variable and its types. find probability mass function and its probability distribution. find the expected value, variance and the standard deviation find the probability density function of continuous random variable find distribution function of c.r.v.
8	Binomial Distribution	Binomial Distribution	 understand random experiment with two or more outcomes. determine probability distribution of random experiment with parameters n and p. find mean, variance, expected value and standard deviation for the binomial distribution.

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