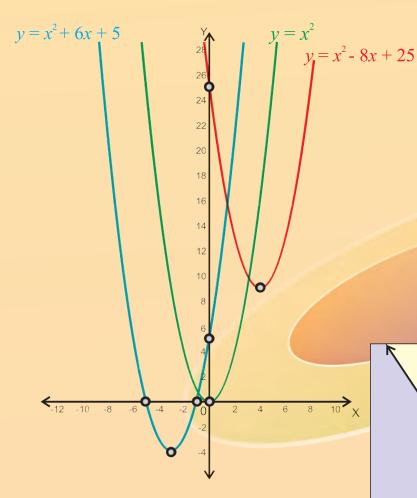
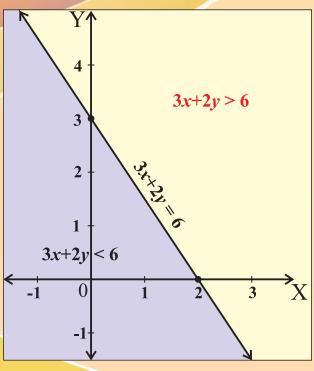


Mathematics & Statistics

Arts & Science Part 1

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.

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Mathematics and Statistics (Arts and Science)

Part - I

STANDARD - XII



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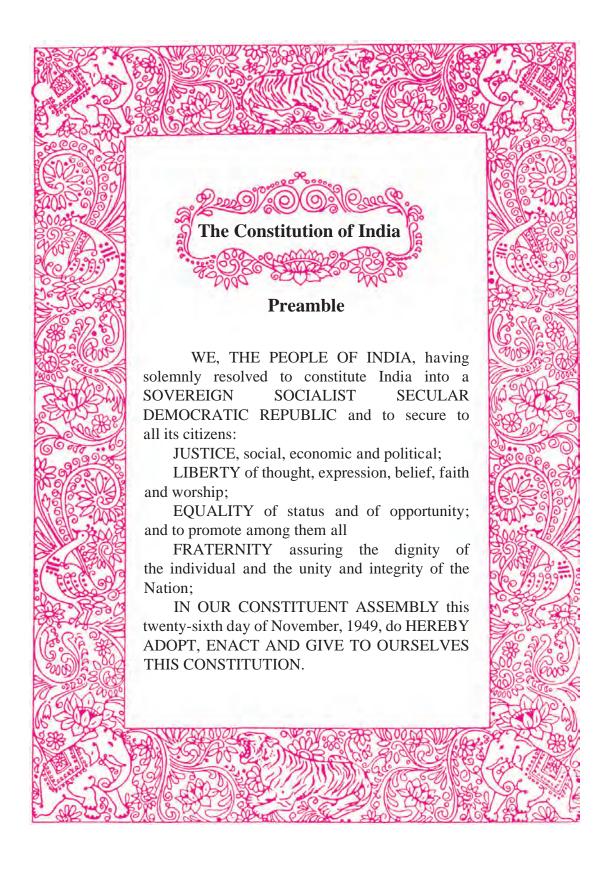
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NATIONAL ANTHEM

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,

Pune

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, consistently, 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 focussed 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.

(Vivek Gosavi)

Director

Date: 21 February 2020 Maharashtra State Bureau of Textbook
Bharatiya Saur: 2 Phalguna 1941 Production and Curriculum Research, Pune.

Mathematics and Statistics Std. XII Part - I Competency Statement

Sr.No.	Area	Topic	Competency Statement
1.	Mathematical Logic	Mathematical Logic	 The student will be able to Identify statement in logic and truth value of it. Combine two or more statements Construct the truth table and examine logical equivalence of statement patterns Find dual and negation of statement pattern Study the applications of logic to switching circuits.
2.	Matrices	Matrices	 Identify orders and types of matrices Perform basic algebraic operations on matrices. Find the inverse of a matrix using elementary transformation and adjoint method Solve the system of linear equations using matrices.
3.	Trigonometric Functions	Trigonometric Equations Solution of a triangle Invers trigonometric function	 Understand and write trigonometric equation Find the principal and general solution of a trigonometric equation. Solve triangle by using sine rule, cosine rule and projection rule and find area of a triangle. Understand inverse trigonometric functions with domain and range.
4.	Pair of straight lines	Pair of straight lines	 Write and interpret the combined equation of two straight lines in plane. Find the point of intersection of two lines and calculate the acute angle between them Study the general second degree equation in x and y with reference to homogeneous part of it

5.	Vectors	Vectors	Understand scalars and vectors and
	, colors	, 661.62.5	 algebra of vectors. Write vectors of 2 or 3 dimensions understand the scalar and vector products Study applications of vectors to area of triangle. Interprete scalar triple product and its applications. Direction ratios and direction cosines of a vector
6.	Line and Plane	Line and Plane	 Find different forms of equation of line Find angle between two intersecting planes Find the angle between a line and a plane Find condition for perpendicularity and parallelness of planes Calculate distance of a point from a plane Find equation of a plane in different forms Find angle between two intersecting planes Find the angle between a line and a plane
7.	Linear programming Problem	Linear programming Problem	 Understand linear equations in one and two variables. Find graphical solution of linear inequation. Understand meaning and formulation of L.P.P. Find solution of L.P.P. by graphical methods.

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