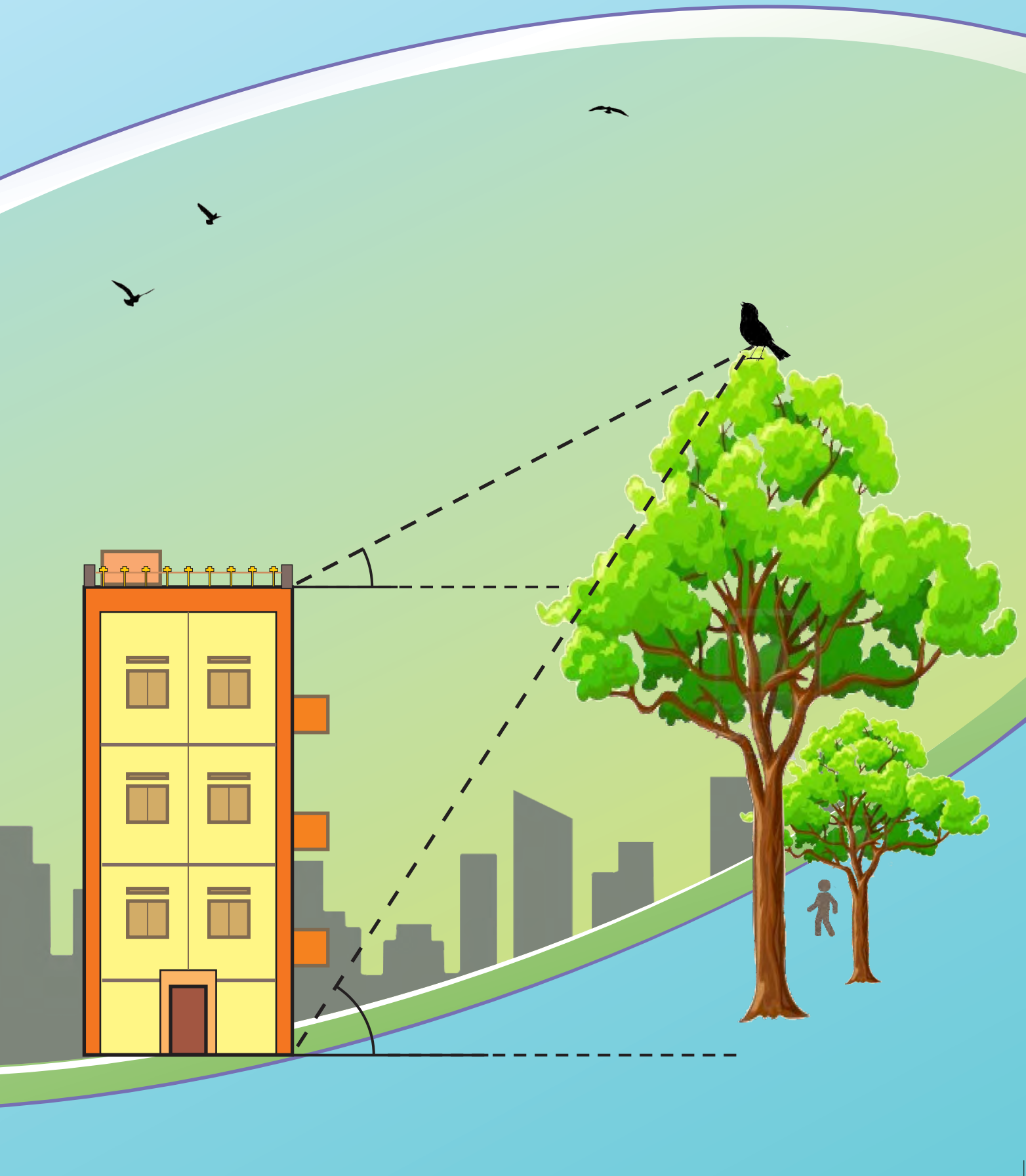
MATHEMATICS

Part - II

STANDARD X



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 II

STANDARD X

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

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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 - II are Geometry, Trigonometry, Coordinate geometry and Mensuration. All of these topics were introduced in the ninth standard. This year you will study some more details of the same. Their utility will be clear from the given examples. 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. Moreover, 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. They too need the basic concepts and the knowledge necessary for working 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 this part. Read the book thoroughly at least once and grasp the concepts.

Additional audio visual material regarding each lesson will be available to you by 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
Maharashtra State Bureau of Textbook
Production and Curriculum Research, Pune.

Pune
Date : 18 March 2018, Gudhipadva
Indian Solar Year : 27 Falgun 1939

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

Area	Topic	Competency Statements
1. Geometry	1.1 Similar triangles 1.2 Circle	The students will be able to - • solve examples using properties of similar trianlges, properties of congruent traingles and Pythagoras theorem. • construct similar triangles. • be able to use properties of chords and tangents. • be able to construct tangents to a circle.
2. Co-ordinate Geometry	2.1 Co-ordinate geometry	• find distance between two points. • find the co-ordinates of a point dividing a segment in given ratio. • find slope of a line.
3. Mensuration	3.1 Surface area and volume	• find length of arc of a circle. • find areas of sector of a circle and segment of a circle. • compute surface areas and volumes of some three dimensional objects.
4. Trigonometry	4.1 Trigonometry	• solve examples using trigionometric identities • solve problems like measuring height of a tree, width of a river bed etc., using trigonometry.

Instructions for Teachers

Read the book in detail and grasp 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 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.

Suitable activities, other than those given in the text book, can be planned to understand the statements of the theorems and to develop the skill to solve problems.

List of some practicals (Specimen)

1. Cut out a triangular piece of card-board. Place a lit up candle or a small lamp on a table. Hold the triangle between a wall and the candle/ lamp. Observe the shadow of the triangle. Decide if the triangle and its shadow are similar. (What care will you take so that the triangle and its shadow are similar?)
2. Cut out two identical right angled triangles. Name the vertices of the triangles as A, B, C on both sides. Draw the altitude on the hypotenuse of one of them. Name the foot of the perpendicular as D. Cut the triangle on its altitude and obtain two triangles. State the correspondences by which the three triangles are similar with one another.
3. Draw a circle. Take three points - one on the circle, one in its interior and one in its exterior. Prepare a table, showing rough figures and stating how many tangents can be drawn to the circle through each of the three points.
4. Draw at least five different circles passing through two given distinct points indicating that innumerable circles can be drawn passing through them.
5. Take a geoboard on which nails are suitably fixed to verify properties of a circle. Prepare a figure using rubber bands for any one of the following theorems.

   (i) Inscribed angle theorem (ii) Tangent secant theorem of angles

   (iii) Theorem of angles inscribed in opposite arcs of a circle.
6. Prepare a model of a circle and an angle. Show different arcs intercepted by the angle in different situations. Draw the corresponding figures in your note book.
7. Draw an angle and divide it into four equal parts using compass and ruler.
8. Take a beaker. Measure its height and radius of base. Calculate its capacity using the formula. Fill it fully with water. Measure the volume of the water with a measuring cylinder. Compare the two results and draw inference.
9. Take a paper cup of the shape of frustum of a cone. Measure the radii of its base and top and also its height. Using formula, calculate its capacity. Fill it fully with water and then measure the volume of the water. Compare the measured and the calculated volumes and verify the formula.
10. Cut two similar triangles out of a card-board. Decide by actual measurements -

    (i) Are their areas proportional to the squares of their perimeters ?

    (ii) Are their areas proportional to the squares of their medians ?

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