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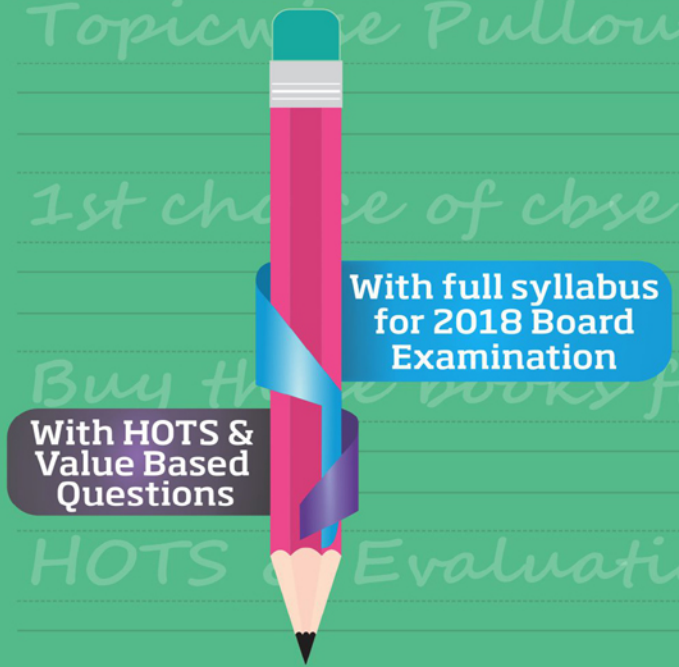

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PREFACE

Year after year CBSE has been introducing changes in the curriculum of various classes. We, at Oswaal Books, closely follow every change made by the Board and endeavor to equip every student with the latest study material to prepare for the Term Examinations.

The latest offering from us are these Worksheets. These aim at providing comprehensive practice material for every chapter to ensure that every concept is revised in totality. These are prepared by experienced teachers who have translated their expertise into making these worksheets a wholesome study package. Every worksheet contains a mix of questions, for which the maximum marks and time are mentioned to create an exam oriented study material.

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- Chapter-wise pullout worksheets with space for writing answers
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We feel happy to add these to our existing portfolio of Question Banks and Sample Question Papers. We hope that with our **Worksheets,** every student will discover a more interactive way of studying and thereby excelling in his examination Questions. We welcome any suggestions that come our way for improvisation.

We wish you good luck for the forthcoming academic year!!

–Editor

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Oswaal books are a must for any student who wishes to score good marks in their exams. I would like to thank the writers for making such awesome books from the depth of my heart. These books really help students to remain stress-free before board examination and attain the best score they can ! THANK YOU OSWAAL BOOKS ! :)

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Anup Chandel, Student, Chhapra Central School, Sandha, Chhapra, Bihar

C.R. Rao

Born: 10 September, 1920
Mathematician and statistician

He is an Indian-born, naturalized American, mathematician and statistician. He is currently professor emeritus at Penn State University and Research Professor at the University at Buffalo. Rao has been honoured by numerous colloquia, honorary degrees, and festschrifts and was awarded the US National Medal of Science in 2002. The American Statistical Association has described him as " A living legend whose work has influenced not just statistics, but has had far reaching implications for fields as varied as economics, genetics, anthropology, geology, national planning, demography, biometry, and medicine. " The Times of India listed Rao as one of the top 10 Indian scientists of all time.

He received an M.Sc. in mathematics from Andhra University and an M.A. in statistics from Calcutta University in 1943. He was among the first few people in the world to hold a master's degree in Statistics

Information in this section is sourced from various available sources. Though all efforts have been made to make sure it is trustworthy, Oswaal Books shall not be responsible for mistakes, if any.

SYLLABUS

Latest Syllabus issued by CBSE for Academic Year 2017-18

Mathematics, Class X (Code No. 041)

3 Hours **Marks 80**

Units	Unit Name	Marks
I	Number Systems	06
II	Algebra	20
III	Coordinate Geometry	06
IV	Geometry	15
V	Trigonometry	12
VI	Mensuration	10
VII	Statistics & Probability	11
	TOTAL	**80**

UNIT I: NUMBER SYSTEMS

1. REAL NUMBERS (15) Periods

Euclid's division lemma, Fundamental Theorem of Arithmetic - statements after reviewing work done earlier and after illustrating and motivating through examples, Proofs of irrationality of $\sqrt{2}$, $\sqrt{3}$, $\sqrt{5}$.

Decimal representation of rational numbers in terms of terminating/non-terminating recurring decimals.

UNIT II: ALGEBRA

1. POLYNOMIALS (7) Periods

Zeros of a polynomial. Relationship between zeros and coefficients of quadratic polynomials. Statement and simple problems on division algorithm for polynomials with real coefficients.

2. PAIR OF LINEAR EQUATIONS IN TWO VARIABLES (15) Periods

Pair of linear equations in two variables and graphical method of their solution, consistency/ inconsistency.

Algebraic conditions for number of solutions. Solution of a pair of linear equations in two variables algebraically - by substitution, by elimination and by cross multiplication method. Simple situational problems. Simple problems on equations reducible to linear equations.

3. QUADRATIC EQUATIONS (15) Periods

Standard form of a quadratic equation $ax^2 + bx + c = 0$, $(a \neq 0)$. Solutions of quadratic equations (only real roots) by factorization, by completing the square and by using quadratic formula. Relationship between discriminant and nature of roots.

Situational problems based on quadratic equations related to day to day activities to be incorporated.

4. ARITHMETIC PROGRESSIONS (08) Periods

Motivation for studying Arithmetic Progression Derivation of the n^{th} term and sum of first n terms of A.P and their application in solving daily life problems.

UNIT III: COORDINATE GEOMETRY

1. LINES (In two dimensions) (14) Periods

Review : Concepts of coordinate geometry graphs of linear equations. Distance formula. Section formula (internal division). Area of a triangle.

UNIT IV: GEOMETRY

1. TRIANGLES (15) Periods

Definitions, examples, counter examples of similar triangles.

1. (**Prove**) If a line is drawn parallel to one side of a triangle to intersect the other two sides in distinct points, the other two sides are divided in the same ratio.
2. (Motivate) If a line divides two sides of a triangle in the same ratio, the line is parallel to the third side.
3. (Motivate) If in two triangles, the corresponding angles are equal, their corresponding sides are proportional and the triangles are similar.
4. (Motivate) If the corresponding sides of two triangles are proportional, their corresponding angles are equal and the two triangles are similar.
5. (Motivate) If one angle of a triangle is equal to one angle of another triangle and the sides including these angles are proportional, the two triangles are similar.
6. (Motivate) If a perpendicular is drawn from the vertex of the right angle of a right triangle to the hypotenuse, the triangles on each side of the perpendicular are similar to the whole triangle and to each other.
7. (Prove) The ratio of the areas of two similar triangles is equal to the ratio of the squares of their corresponding sides.
8. (Prove) In a right triangle, the square on the hypotenuse is equal to the sum of the squares on the other two sides.
9. (Prove) In a triangle, if the square on one side is equal to sum of the squares on the other two sides, the angles opposite to the first side is a right angle.

2. CIRCLES (08) Periods

Tangents to a circle at a point of contact.

(i) **(Prove)** The tangent at any point of a circle is perpendicular to the radius through the point of contact.

(ii) **(Prove)** The lengths of tangents drawn from an external point to circle are equal.

3. CONSTRUCTIONS (8) Periods

(i) Division of a line segment in a given ratio (internally).
(ii) Tangent to a circle from a point outside it.
(iii) Construction of a triangle similar to a given triangle.

UNIT V: TRIGONOMETRY

1. INTRODUCTION TO TRIGONOMETRY (10) Periods

Trigonometric ratios of an acute angle of a right-angled triangle. Proof of their existence (well defined); motivate the ratios whichever are defined at 0° and 90°. Values (with proofs) of the trigonometric ratios of 30°, 45° and 60°. Relationships between the ratios.

2. TRIGONOMETRIC IDENTITIES (15) Periods

Proof and applications of the identity $\sin^2 A + \cos^2 A = 1$. Only simple identities to be given. Trigonometric ratios of complementary angles.

3. HEIGHTS AND DISTANCES : Angle of elevation, Angle of Depression (08) Periods

Simple problems on heights and distances. Problems should not involve more than two right triangles. Angles of elevation / depression should be only 30°, 45°, 60°.

UNIT VI : MENSURATION

1. AREAS RELATED TO CIRCLES (12) Periods

Motivate the area of a circle; area of sectors and segments of a circle. Problems based on areas and perimeter / circumference of the above said plane figures. (In calculating area of segment of a circle, problems should be restricted to central angle of 60°, 90°and 120° only. Plane figures involving triangles, simple quadrilaterals and circle should be taken.)

2. SURFACE AREAS AND VOLUMES (12) Periods

(i) Surface areas and volumes of combinations of any two of the following: cubes, cuboids, spheres, hemispheres and right circular cylinders/cones. Frustum of a cone.

(ii) Problems involving converting one type of metallic solid into another and other mixed problems. (Problems with combination of not more than two different solids be taken.)

UNIT VII : STATISTICS AND PROBABILITY

1. STATISTICS (18) Periods

Mean, median and mode of grouped data (bimodal situation to be avoided). Cumulative frequency graph.

2. PROBABILITY (10) Periods

Classical definition of probability. Simple problems on single events (not using set notation).

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QUESTIONS PAPER DESIGN 2017–18, CLASS-X

Mathematics (Code No. 041) **Time : 3 hrs** **Marks : 80**

S. No.	Typology of Questions	Very Short Answer (VSA) (1 Mark)	Short Answer –I (SA) (2 Marks)	Short Answer –II (SA) (3 Marks)	Long Answer (LA) (4 Marks)	Total Marks	% Weight-age (appr-ox.)
1	**Remembering** (Knowledge based Simple recall questions, to know specific facts, terms, concepts, principles or theories; Identify, define, or recite, information)	2	2	2	2	20	25%
2	**Understanding** (Comprehension to be familiar with meaning and to understand conceptually, interpret, compare, contrast, explain, paraphrase, or interpret information)	2	1	1	4	23	29%
3	**Application** (Use abstract information in concrete situation, to apply knowledge to new situation; Use given content to interpret a situation, provide an example, or solve a problem)	2	2	3	1	19	24%
4	**Higher Order Thinking Skills** (Analysis & Synthesis- Classify, compare, contrast, or differentiate between different pieces of information; Organize and /or integrate unique pieces of information from variety of sources)	-	1	4	-	14	17%
5	**Evaluation** (Judge, and/or justify the value or worth of a decision or outcome, or to predict outcomes based on values)	-	-	-	1	4	5%
	Total	**6×1=6**	**6×2=12**	**10×3=30**	**8×4=32**	**80**	**100%**

Note: One of the LA will be to assess the values inherent in the texts.

INTERNAL ASSESSMENT **20 Marks**

- Periodical Test 10 Marks
- Note Book Submission 05 Marks
- Lab Practical (Lab activities to be done from the prescribed books) 05 Marks

Circular No.: Acad – 14/2017 (Date : 31/01/2017)

CBSE/CM/2017

Subject : Restoring of class X Board examination with effect from the Academic Year 2017-18.

Consequent upon the decision taken by the Governing Body of the Board, the duel scheme of examination for Class-X known hitherto as Scheme-I and Scheme-II shall stand discontinued for the students appearing in Class-X from the Academic Year 2017-18 and onwards. The examination from Academic Year 2017-18 and onwards would be conducted as per the remodeled assessment structure explained below. However, for Class-X students appearing in Academic Year 2016-17 examination, the existing scheme of assessment would apply.

A. <u>Remodeled assessment structure effective from the Academic Year 2017-18 for Class-X</u>

1. <u>Scholastic Area</u>

<table>
<tr><td></td><td colspan="3">Total 100 marks
(Syllabus for assessment will be only Class-X)</td></tr>
<tr><td rowspan="2">Subject</td><td rowspan="2">80 Marks
(Board Examination)
Student has to secure 33% marks out of 80 marks in each subject</td><td colspan="3">20 Marks (Internal Assessment)
Student has to secure 33% marks out of overall 20 marks earmarked in each subject</td></tr>
<tr><td>Periodic Test
(10 marks)</td><td>Notebook Submission
(5 Marks)</td><td>Subject Enrichment Activity
(5 Marks)</td></tr>
<tr><td></td><td>(i)</td><td>(ii)</td><td>(iii)</td></tr>
<tr><td>Language 1</td><td rowspan="6">Board will conduct Class-X Examination for 80 marks in each subject covering 100% syllabus of the subject of Class-X only. Marks and Grades both will be awarded for Individual subjects. 9- point grading will be same as followed by the Board in Class XII</td><td rowspan="6">Periodic written Test, restricted to three in each subject in an Academic Year. Average of the best two tests to be taken for final marks submission</td><td rowspan="6">This will cover :
● Regularity
● Assignment completion
● Neatness & upkeep of notebook</td><td>Speaking and listening skills</td></tr>
<tr><td>Language 2</td><td>Speaking and listening skills</td></tr>
<tr><td>Science</td><td>Practical Lab Work</td></tr>
<tr><td>Mathematics</td><td>Maths Lab Practical</td></tr>
<tr><td>Social Science</td><td>Map work and project work</td></tr>
<tr><td>6th Additional Subject</td><td colspan="3">Scheme of studies for 6th additional subject is detailed in Annexure – I
Note : In case student opts a language as 6th additional subject the modalities defined for Languages I and II shall be followed.</td></tr>
</table>

(i) Periodic Test (10 marks) :

The school should conduct three periodic written tests in the entire academic year and the average of the best two will be taken. The schools have the autonomy to make its own schedule. However, for the purpose of gradient learning, three tests may be held as one being the mid-term test and other the two being pre-mid and post mid-term with portion of syllabus cumulatively covered. The gradually increasing portion of contents would prepare students acquire confidence for appearing in the Board examination with 100% syllabus. The school will take the average of the best two tests for final marks submission.

(ii) Notebook Submission (5 marks) :

Notebook submission as a part of internal assessment is aimed at enhancing seriousness of students towards preparing notes for the topics being taught in the classroom as well as assignments. This also addresses the critical aspect of regularity, punctuality, neatness and notebook upkeep.

(iii) Subject Enrichment Activities (5 marks) :

These are subjest specific application activities aimed at enrichment of the understanding and skill development. These activities are to be recorded internally by respective subject teachers.

For Languages : Activities conducted for subject enrichment in languages should aim at equipping the learner to develop effective speaking and listening skills.

For Mathematics : The listed laboratory activities and projects as given in the prescribed publication of CBSE/NCERT may be followed.

For Science : The listed practical works/activities may be carried out as prescribed by the CBSE in the Curriculum.

For Social Science : Map and project work may be undertaken as prescribed by the CBSE in the Curriculum.

2. Co-Scholastic Activities :

Schools should promote co-curricular activites for the holistic development of the student. These activities will be graded on a 5-point grading scale (A to E) and will have no descriptive indicators. No upscaling of grades will be done.

Activities	**To be graded on a 5- point scale (A-E) in school**	**Areas and Objectives (as prescribed in the Scheme of Studies for Subjects of Internal Assessment**
Work Education or Pre-Vocational Education	By the Concerned Teacher	Work Education is a distinct curricular area for student for participation in social, economic and welfare activities. Student gets a sense of community service and develops self-reliance. (for Pre-Vocational Education as per Scheme of Studies)
Art Education	By the VA/PA or the Concerned Teacher	Art Education constitutes an important area of curricular activity for development of wholesome personality of the students. Students will select one or more forms of creative arts.
Health & Physical Education (Sports/ Martial Arts/Yoga/ NCC etc.)	By the PE Teacher	Health & Physical Activity preferably sports must be given a regular period. Students should be provided opportunities to get professionally trained in the area of their interest. Indigenous sports, yoga and NCC must be encouraged in the the schools creating a sense of physical fitness, discipline, sportsmanship, patriotism, self-sacrifice and health care.

3. Discipline (Attendance, Sincerity, Behaviour, Values) :

Discipline significantly impacts career shaping and it helps build character. Sincerity, good behavior and values develop strength and foster unity and co-operation. Therefore, the element of discipline has been introduced. Class teacher will be responsible for grading the students on a Five-point scale (A to E).

The Internal assessment comprising 20 marks (10+5+5) entails objectivity and a structured approach.For a holistic assessment, the teachers are expected to make it an effective tool.

B. Documentation :

Records pertaining to the internal assessment of the students done by the schools will be maintained for a period of three months from the date of declaration of result for verification at the discretion of the Board. Subjudiced cases, if any or those involving RTI/Grievances may however be retained beyond three months.

C. Assessment Scheme for Class-VI to IX in the CBSE affiliated schools :

The CBSE affiliated schools, for the purpose of uniformity in classes VI to IX may, replicate the same assessment model as described above for Class-X for Academic Year 2017-18.

The above scheme must be implemented in letter and spirit.

Additional Subject **Annexure–I**

Excerpt only

Subject : FIT/ICT	Board Class-X Examination for 40 marks	Practical Examination 60 marks

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WRITING NOTES

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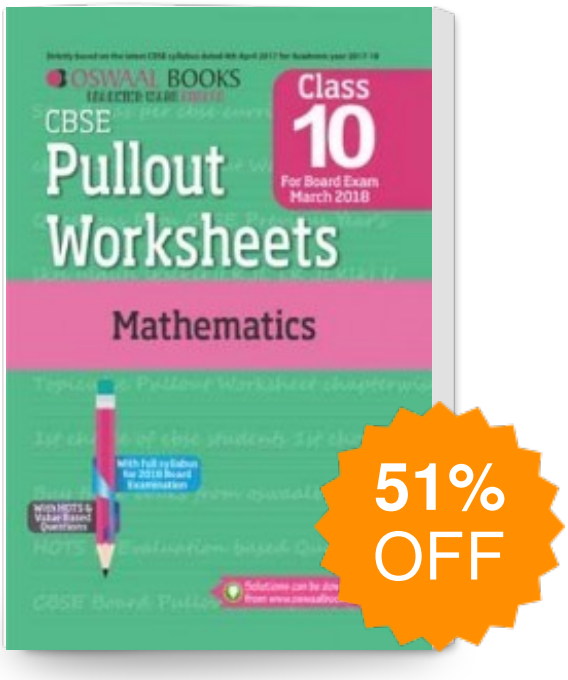
Oswaal CBSE Pullout Worksheet Class 10 Maths (March 2018 Exam)



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