

Class 12 Mathematics Study Guidance Document Title: Class 12 Mathematics Preparation Guide Sections: Syllabus Overview Relations & Functions Algebra (Matrices, Determinants) Calculus (Limits, Continuity, Differentiation, Integrals, Differential Equations) Vectors & 3D Geometry Linear Programming Probability

Best Books NCERT Class 12 Mathematics (primary book). RD Sharma (for practice). ML Khanna (for problem-solving & JEE aspirants).

Chapter-Wise Strategy Calculus (44% weightage): Practice NCERT examples thoroughly. Probability & Algebra: Focus on formula-based questions. Vectors & 3D Geometry: Visualize diagrams; practice past papers.

Tips Solve every NCERT exercise (boards pick direct questions). Maintain a formula notebook for revision. Practice past 5 years' question papers.

Major Topics for Class 12 Mathematics Boards 1. Relations & Functions (8–10 marks)

Types of relations and functions.

One-one, onto functions, composition.

Inverse of functions.

2. Algebra (10–12 marks)

Matrices: Types, operations, transpose, determinant of a matrix.

Determinants: Properties, applications (solving system of linear equations using Cramer's Rule).

3. Calculus (35–40 marks → most important!)

Continuity & Differentiability: Chain rule, derivatives of inverse trigonometric functions, exponential & logarithmic functions.

Applications of Derivatives: Tangents & normals, increasing/decreasing functions, maxima & minima.

Integrals: Indefinite integrals, definite integrals, properties.

Applications of Integrals: Area under the curve.

Differential Equations: Formation, order & degree, methods of solving.

Calculus alone is ~44% of the paper.

4. Vectors & 3D Geometry (13–14 marks)

Vectors: Dot product, cross product, applications.

3D Geometry: Equation of line & plane, distance between two lines/points.

5. Linear Programming (5–6 marks)

Formulating linear programming problems.

Solving by graphical method.

6. Probability (10–12 marks)

Conditional probability.

Bayes' theorem.

Probability distribution (Binomial).

Mean and variance of random variable.

Weightage Summary (Approx.)

Calculus: 44%

Algebra (Matrices & Determinants): 14%

Probability: 10%

Vectors & 3D: 13%

Relations & Functions: 10%

Linear Programming: 6%

Tips for Class 10 Boards: NCERT is 100% essential (questions directly come from it). Practice all examples + exercises from NCERT. Revise formulas for Trigonometry & Surface Area/Volume regularly. Solve last 5 years' papers — repeated questions are common. Focus more on Algebra + Trigonometry + Geometry (highest scoring). Weightage Summary (Approx.)

Algebra → 20% Geometry → 14% Trigonometry → 14% Mensuration → 12%  
Statistics & Probability → 12% Coordinate Geometry → 8% Real Numbers → 6%

## 2. Vocabulary Improvement Document

Title: Vocabulary Building Guide for Students

Sections:

Daily Practice Plan

Learn 10 new words daily.

Use them in sentences.

Revise weekly with flashcards.

Word Lists (Essential for Exams)

High-Frequency Words: Abundant, Benevolent, Concur, Diligent, Eloquent.

Roots & Prefixes:

bene- → good (benefit, benevolent).

dict- → speak (predict, contradict).

Idioms & Phrases

“Burning the midnight oil” → Studying late at night.

“Cut to the chase” → Get to the point.

Resources

Word Power Made Easy by Norman Lewis.

Read The Hindu editorial section.

Use vocabulary apps (Anki, Quizlet).

### 3. Mathematics Honours College Guidance Document

Title: Guide to Mathematics Honours after Class 12

Sections:

Top Colleges in India for Math Honours

Delhi University (St. Stephen's, Hindu College, Miranda House).

Chennai Mathematical Institute (CMI).

Indian Statistical Institute (ISI).

Banaras Hindu University (BHU).

Admission Process

DU: Merit-based on Class 12 marks (CUET in some cases).

CMI/ISI: Entrance exams.

BHU: CUET entrance exam.

Eligibility

Minimum 60% in Class 12 with Mathematics as a subject.

Career Opportunities

Academia (M.Sc, PhD).

Data Science & Machine Learning.

Finance & Actuarial Science.

Government exams (UPSC, SSC, Banking).

“Which is the most important topic in Class 12 Math for boards?”

### JEE Preparation Guidance Document

Title: Complete Guide for JEE (Main & Advanced) Preparation

#### 1. Understanding JEE Exam Structure

JEE Main → Gateway to NITs, IIITs, and eligibility for JEE Advanced.

JEE Advanced → Required for admission into IITs.

Exam Pattern (JEE Main):

Subjects: Physics, Chemistry, Mathematics.

Question Type: MCQs + Numerical Value Questions.

Marking Scheme: +4 for correct, -1 for wrong (MCQs).

## 2. Best Books for JEE Prep

Mathematics

NCERT (Class 11 & 12).

RD Sharma (Basics).

Cengage Series (Advanced problems).

ML Khanna / Tata McGraw Hill (for practice).

Physics

NCERT (concepts).

HC Verma (Concepts of Physics Vol 1 & 2).

I.E. Irodov (for advanced problems).

DC Pandey Series (Arihant).

Chemistry

NCERT (very important for Inorganic & Physical).

OP Tandon (Physical Chemistry).

Morrison & Boyd (Organic Chemistry basics).

JD Lee (Inorganic Chemistry reference).

## 3. Preparation Strategy

Step 1: Strong Foundation

Finish NCERTs thoroughly (all 3 subjects).

Make a formula sheet for quick revision.

Step 2: Daily Routine

6–8 hrs study daily (divided into 3 subjects).

Solve previous years' JEE papers (at least last 10 years).

Take mock tests weekly (analyze mistakes).

Step 3: Subject-wise Tips

Physics: Focus on concepts first (HC Verma) before problem-solving.

Chemistry: NCERT line by line for Inorganic; practice Organic mechanisms.

Mathematics: Practice daily; revise formulas frequently.

#### 4. Time Management

Class 11 (Foundation): Build strong basics.

Class 12 (Application): Focus on board + JEE together.

Revision Phase: Solve mock tests daily, maintain error notebook.

#### 5. Common Mistakes to Avoid

Ignoring NCERT (especially Chemistry).

Solving too many books without mastering one.

Not analyzing mock tests.

Overworking without breaks (burnout).

#### 6. Online Resources

NTA Abhyas App (free mock tests).

Khan Academy / Physics Galaxy (concepts).

Topper interviews & revision notes (YouTube, coaching sites).

7. Motivation & Mindset Consistency > Intensity. Stay healthy: sleep 6–8 hrs, eat balanced food. Don't compare your progress with others—focus on improvement.

Q what are the best websites for enhancing vocabulary, synonyms , antonyms and english? Ans. Tip for Students: Use Merriam-Webster/Thesaurus.com for quick lookups. Use Vocabulary.com & Quizlet for long-term memory building. Use Oxford/Cambridge for academic English (boards, competitive exams).