GCSE MATHEMATICS:

FOUNDATION TIER LEARNING ROADMAP.

This roadmap lists the essential topics in the logical chronological order required to progress toward and pass the GCSE Foundation exam.

STEP 1: NUMBER SKILLS (The Absolute Essentials)

Master these topics first, as they are used in every other module.

Place Value & Ordering: Identifying values and ordering integers.

The Four Operations: Column addition, subtraction, long/short multiplication, and division without a calculator.

Negative Numbers: Arithmetic involving positive and negative values.

BIDMAS / PEMDAS: Following the correct order of operations.

Rounding & Estimation: Rounding to the nearest 10/100, decimal places, and significant figures.

Factors, Multiples & Primes: Identifying LCM, HCF, prime factors, square numbers, cube numbers, and roots.

STEP 2: FRACTIONS, DECIMALS, AND PERCENTAGES (FDP)

These topics represent the same mathematical quantities in different formats.

Equivalent Fractions: Simplifying fractions and converting between mixed numbers and improper fractions.

Fraction Operations: Adding, subtracting, multiplying, and dividing standard fractions.

FDP Conversions: Changing fractions to decimals, decimals to percentages, and vice versa.

Percentage of an Amount: Finding percentages with and without a calculator and working out percentage change.

STEP 3: RATIO, PROPORTION, AND RATES OF CHANGE

This module is a heavy focus area, usually making up about 25% of the foundation exam paper.

Simplifying Ratios: Writing ratios in simplest form or in the unit form 1:n.

Sharing in a Ratio: Dividing a total quantity into given parts.

Direct Proportion: Solving recipe adjustments and basic currency conversions.

Basic Rates: Working with speed, distance, time, and basic mass/density calculations.

STEP 4: BASIC ALGEBRA (The Language of Symbols)

Foundation level algebra focuses entirely on core rules and simple notation.

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Algebraic Notation: Understanding how to write expressions (e.g., 3 * x = 3x).

Simplifying Expressions: Collecting like terms (e.g., 2x + 3y + x = 3x + 3y).

Substitution: Swapping out letters for numbers in expressions and basic formulas.

Solving Linear Equations: Finding the value of 'x' in one-step and two-step equations.

Sequences: Finding the next terms in a sequence and understanding basic term-to-term rules.

STEP 5: GEOMETRY AND MEASURE (Shapes and Space)

This section requires memorising formulas and identifying properties of shapes.

Properties of Shapes: Identifying 2D shapes, 3D solids, parallel lines, and types of angles.

Angle Rules: Calculating missing angles on straight lines (180°), around a point (360°), and inside a triangle (180°).

Perimeter & Area: Calculating basic perimeters and the areas of rectangles, triangles, parallelograms, and trapezia.

Circles: Memorising and using the formulas for Circumference ($C = \pi d$) and Area ($A = \pi r^2$).

Units & Conversions: Converting between metric units of length, mass, and volume.

STEP 6: BASIC STATISTICS AND PROBABILITY (Data Handling)

These topics focus on interpreting information and predicting real-world outcomes.

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The Averages: Calculating the Mean, Median, Mode, and Range from a simple data list.

Charts & Graphs: Reading and drawing bar charts, pictograms, pie charts, and frequency tables.

The Probability Scale: Understanding that probability ranges from 0 (impossible) to 1 (certain).

Calculating Probability: Finding the mathematical chance of an event happening as a fraction or decimal.