GENERAL

# gmat math formulas cheat sheet

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## Introduction

The Graduate Management Admission Test (GMAT) is notorious for its quantitative rigor. While many students spend countless hours solving practice problems, few realize how a well crafted cheat sheet can transform the way they approach the math section. A cheat sheet is not a shortcut that replaces learning; it is a compact, organized reference that consolidates the most frequently used formulas, rules, and shortcuts into a single, easy to scan resource. When used strategically, it can shave precious seconds off each question, reduce mental fatigue, and boost confidence on test day.

In this guide, we'll dive deep into the world of GMAT math formulas, show you how to build a cheat sheet that covers every core topic, and share proven strategies for integrating it into your study routine. Whether you're a seasoned test taker or a first time candidate, the insights below will help you create a resource that feels as powerful as it looks.

## Why a GMAT Math Cheat Sheet is Essential

Preparing for the GMAT math section is a marathon, not a sprint. Students often find themselves juggling algebraic identities, geometric theorems, and data sufficiency logic while keeping track of time. A cheat sheet offers:

- Instant Recall: Instead of memorizing every formula, you can quickly locate it during practice or on the actual exam.
- Time Management: Having formulas at a glance reduces the time spent searching for the correct equation.
- Confidence Boost: Knowing that you have a reliable reference reduces anxiety and lets you focus on problem solving.
- Study Efficiency: A well structured cheat sheet forces you to distill the material into its most essential elements, reinforcing your understanding.

Because the GMAT's math section is divided into three main areas—Algebra, Arithmetic/Number Properties, and Geometry—an effective cheat sheet groups formulas by these categories, making it easier to locate the right tool for each question type.

## Core Math Topics Covered in the GMAT

### Algebra

Algebraic manipulation is the backbone of the GMAT's quantitative reasoning. The following concepts are frequently tested:

- Linear equations and inequalities
- Quadratic equations and factoring
- Polynomials and exponents
- Logarithms and exponentials (in a limited capacity)
- Ratios, proportions, and rates

Mastering these topics allows you to solve systems of equations, simplify expressions, and apply algebraic

reasoning to data  sufficiency questions.

### Arithmetic and Number Properties

Arithmetic questions test basic number sense and the properties of integers, fractions, and decimals. Key concepts include:

- Prime numbers, factors, and multiples
- Greatest common divisor (GCD) and least common multiple (LCM)
- Percentages, rates, and proportions
- Ratios, averages, and weighted averages
- Number sequences and patterns

These topics often appear in “quick  fire” problems that require rapid mental calculations.

### Geometry

Geometry questions assess your ability to work with shapes, angles, and spatial reasoning. The main geometric concepts on the GMAT are:

- Triangles, circles, and polygons
- Area and perimeter formulas
- Volume and surface area of 3  D shapes
- Coordinate geometry (distance, midpoint, slope)
- Similar triangles and similarity ratios

Understanding these formulas enables you to solve problems involving real  world scenarios, such as calculating the area of a garden or the volume of a container.

### Data Sufficiency

Data  sufficiency questions are unique to the GMAT. They assess whether you can determine the answer based solely on the information given, rather than solving the problem outright. Key skills include:

- Identifying independent and dependent variables
- Recognizing when additional information is needed
- Using algebraic manipulation to isolate variables
- Applying logical reasoning to determine if the data is sufficient

A cheat sheet for data  sufficiency should list common patterns, such as “Both statements together are sufficient” or “One statement alone is sufficient.”

## Key Formulas Every GMAT Candidate Should Know

Below is a curated list of the most frequently used formulas, grouped by topic. Each formula is accompanied by a brief explanation to aid quick recall.

- Linear Equation: y = mx + b – slope–intercept form; useful for coordinate geometry.
- Quadratic Formula: x = [-b ± " ($b^2$-4ac)] / (2a) – solves $ax^2 + bx + c = 0$.
- Factorization: $a^2 - b^2 = (a - b)(a + b)$ – difference of squares.
- Sum of an Arithmetic Series: S_n = n/2 (a_1 + a_n) – where n is the number of terms.
- Sum of a Geometric Series: S_n = a_1 (1 - r^n) / (1 - r) – r "` 1.
- Area of a Triangle: A = ½ × base × height.
- Area of a Circle: A = < +"à

- Circumference of a Circle: C = 2< .
- Area of a Rectangle: A = l × w.
- Perimeter of a Rectangle: P = 2(l + w).
- Area of a Parallelogram: A = base × height.
- Volume of a Cube: V = s³.
- Volume of a Rectangular Prism: V = l × w × h.
- Surface Area of a Cube: SA = 6s².
- Surface Area of a Rectangular Prism: SA = 2(lw + lh + wh).
- Distance Formula: d = " [(x , - x •)² + (y , - y •)²].
- Midpoint Formula: M = ((x • + x ,)/2 , (y • + y ,)/2).
- Slope Formula: m = (y , - y •) / (x , - x •).
- Percentage Change: 9BR Ò ²†æPw - old)/old] × 100%.
- Weighted Average: Avg = (:2 ‡`alue × weight)) / :2 peights.
- Prime Factorization: Decompose numbers into primes (useful for GCD/LCM).
- Greatest Common Divisor (GCD): Highest number that divides two numbers without a remainder.
- Least Common Multiple (LCM): Smallest number that is a multiple of two numbers.
- Ratio: a:b = a / b.
- Proportion: a:b = c:d !’ cross multiplication.
- Similarity Ratio: k = side , / side • (for similar triangles).
- Area of a Trapezoid: A = ½ (a + b) × h, where a and b are the bases.
- Median of a Set: Middle value when sorted (useful in data sufficiency).
- Mode of a Set: Most frequently occurring value.
- Standard Deviation (approx.): <2 Ò !¥²ƒ£(x - ;Â›"'ôåÒ ‡ arely tested).
- Data Sufficiency Patterns: “Both statements together are sufficient” (B), “One statement alone is sufficient” (A or C), “Neither statement alone is sufficient, but together are” (D).

## Organizing Your Cheat Sheet for Quick Recall

A cheat sheet’s effectiveness hinges on its layout. Here are some design principles that keep information accessible:

- Section Headings: Use clear titles like “Algebra,” “Geometry,” and “Data Sufficiency” to compartmentalize formulas.
- Color Coding: Assign a color to each section (e.g., blue for algebra, green for geometry). This visual cue speeds up retrieval.
- Bullet Points: Keep each formula on a single line with a concise description.
- Abbreviations: Use standard algebraic abbreviations (e.g., 9B `or change, r for radius) to save space.
- Space for Notes: Leave a small area in each section for quick annotations, such as “use when base is missing.”
- Key Formula Boxes: Highlight the most frequently used formulas in a separate “Quick Reference” box at the top or bottom.

## Tips for Using Your Cheat Sheet Effectively During Practice

Having a cheat sheet is only half the battle; using it efficiently requires practice.

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