

OFFICIAL COURSE STUDY GUIDE

GRE Quant Bootcamp

A complete quantitative reasoning course: arithmetic through data interpretation, GRE-style.

TEST PREP · INTERMEDIATE · 5 MODULES · 19 HR 31 MIN

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GRE Quant Bootcamp: The Complete Study Guide

2026 Edition

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INTRODUCTION

About This Course

Welcome to the official study guide for the GRE Quant Bootcamp. This comprehensive course prepares you for the quantitative reasoning section of the GRE, covering everything from fundamental arithmetic to advanced data interpretation. Mastering these skills is crucial for achieving a strong score on the exam and for your graduate school applications.

The GRE tests quantitative reasoning in a specific way, often requiring strategic thinking more than complex calculations. This course teaches you to approach problems with that mindset. We focus on the methods and frameworks that lead to success on test day.

This curated learning path organizes expert instruction from GRE Ninja Tutoring into five modules and 24 lessons. MegaCourse enhances the original video series with additional reading materials, resource lessons, a final knowledge-check quiz, and a clear structure. You will track your progress and earn a shareable certificate upon completion.

Course Facts

FORMAT	5 modules · 24 lessons
VIDEO INSTRUCTION	About 19 hr 31 min
LEVEL	Intermediate
CATEGORY	Test Prep
INSTRUCTOR	GRE Ninja Tutoring
CERTIFICATE	Included with course completion on MegaCourse
COURSE HOME	megacourse.app/courses/gre-quant-bootcamp

What You Will Learn

- Rebuild arithmetic, algebra, and geometry the way the GRE tests them.
- Handle Quantitative Comparison questions with a reliable framework.
- Interpret data displays quickly and accurately.
- Know when to calculate, estimate, or test numbers.

Who This Course Is For

This course is designed for anyone preparing to take the GRE General Test, particularly those aiming to strengthen their quantitative reasoning abilities. It is ideal for students who need to refresh or rebuild their math foundation from the ground up, specifically in the style the GRE demands.

Before beginning, you should have a basic familiarity with high school mathematics. If your math skills are rusty, that is perfectly fine. This course is structured to help you review and solidify those concepts.

Before You Start

- Basic familiarity with high school mathematics.

How to Use This Guide

To get the most from the GRE Quant Bootcamp, approach each lesson systematically. Begin by watching the video instruction for a given lesson. These videos introduce concepts and demonstrate problem-solving techniques.

After viewing the video, turn to this study guide. Use it to review key definitions, formulas, and strategies presented in the lesson. Work through the practice problems provided here to reinforce your understanding. Active engagement with the material, rather than passive viewing, is vital for retention.

Regularly consult the glossary for unfamiliar terms and review the module summaries. This consistent practice and review will help consolidate your learning and build confidence.

CHAPTER 1

Section 1: Foundations of GRE Quantitative Reasoning

This chapter lays the groundwork for success on the GRE Quantitative Reasoning section. It begins by outlining the structure and question types you will encounter, along with essential test-taking strategies. The core of the chapter then reviews fundamental arithmetic, algebraic principles, and exponent rules, ensuring you have a strong numerical foundation. Finally, it covers essential geometry concepts, from coordinate planes to properties of figures, and introduces specialized strategies for Quantitative Comparison questions, inequalities, and absolute values. By mastering these topics, you will build the confidence and skills needed to approach a wide range of GRE quantitative problems.

Approaching GRE Quant, Arithmetic, Algebra, and Exponents

Covers: GRE Quant Ep 0: How to approach GRE Quant · GRE Quant Ep 1: Arithmetic & Algebra · GRE Quant Ep 2: Exponents

The GRE Quantitative Reasoning section assesses your ability to understand, interpret, and analyze quantitative information. It tests basic mathematical skills and concepts. The section consists of four main question types: Problem Solving, Quantitative Comparison, Numeric Entry, and Data Interpretation. Problem Solving questions are standard multiple-choice questions requiring calculation or logical reasoning. Quantitative Comparison questions ask you to compare two quantities, A and B, and determine their relationship. Numeric Entry questions require you to type your answer into a box. Data Interpretation questions present data in graphs or tables and ask you to analyze it.

Effective test-taking begins with understanding the question. Read carefully to identify what is being asked and what information is provided. Do not jump to calculations before you have a clear plan. Consider estimation or approximation as a strategy when exact calculation is not necessary or too time-consuming. Practice recognizing patterns and common traps. Time management is crucial. Allocate your time wisely across questions and do not get stuck on any single problem for too long. If a question seems overly complex, consider if there is a simpler approach or if it is better to make an educated guess and move on.

Arithmetic forms the bedrock of quantitative reasoning. A solid grasp of integers, fractions, decimals, and percentages is essential. Integers include positive and negative whole numbers and zero. Fractions represent parts of a whole; operations with fractions require common denominators for addition and subtraction, and direct multiplication/division for others. Decimals are another way to represent fractions, often used in calculations involving money or measurements. Percentages express a number as a fraction of 100. For example, 25% is equivalent to $\frac{1}{4}$ or 0.25.

The order of operations, often remembered by the acronym PEMDAS (Parentheses, Exponents, Multiplication and Division, Addition and Subtraction), dictates the sequence of calculations. Operations

within parentheses are performed first, followed by exponents, then multiplication and division from left to right, and finally addition and subtraction from left to right.

Algebra introduces variables to represent unknown quantities. Algebraic expressions combine numbers, variables, and operations. For example, $3x + 5$ is an expression. Equations set two expressions equal to each other, such as $3x + 5 = 11$. Solving an equation means finding the value of the variable that makes the equation true. This often involves isolating the variable by performing inverse operations on both sides of the equation.

Example: Solve for x : $2x - 7 = 13$

1. Add 7 to both sides: $2x - 7 + 7 = 13 + 7 \Rightarrow 2x = 20$

2. Divide both sides by 2: $2x / 2 = 20 / 2 \Rightarrow x = 10$

Exponents provide a shorthand for repeated multiplication. In b^n , b is the base and n is the exponent. b^n means b multiplied by itself n times. For instance, $2^3 = 2 * 2 * 2 = 8$.

Key rules for exponents:

- **Multiplication:** When multiplying powers with the same base, add the exponents: $b^m * b^n = b^{(m+n)}$. Example: $2^3 * 2^4 = 2^{(3+4)} = 2^7$.
- **Division:** When dividing powers with the same base, subtract the exponents: $b^m / b^n = b^{(m-n)}$. Example: $5^6 / 5^2 = 5^{(6-2)} = 5^4$.
- **Power of a Power:** When raising a power to another power, multiply the exponents: $(b^m)^n = b^{(m*n)}$. Example: $(3^2)^3 = 3^{(2*3)} = 3^6$.
- **Zero Exponent:** Any non-zero base raised to the power of zero equals 1: $b^0 = 1$. Example: $7^0 = 1$.
- **Negative Exponents:** A negative exponent indicates the reciprocal of the base raised to the positive exponent: $b^{(-n)} = 1 / b^n$. Example: $4^{(-2)} = 1 / 4^2 = 1/16$.
- **Fractional Exponents:** A fractional exponent $b^{(m/n)}$ means the n -th root of b raised to the power of m . $b^{(1/n)}$ is the n -th root of b . Example: $8^{(2/3)} = (\text{cube root of } 8)^2 = 2^2 = 4$.

Understanding these rules allows for simplification of complex expressions involving exponents. Pay close attention to the base and the sign of the exponent. A common mistake is to confuse $(-2)^2$, which is 4, with -2^2 , which is -4. The parentheses make a difference.

Geometry: Coordinate and Figure Geometry

Covers: GRE Quant Ep 3: Coordinate Geometry · GRE Quant Ep 4: Figure Geometry Part I · GRE Quant Ep 5: Figure Geometry Part 2

Coordinate geometry connects algebra and geometry by representing figures on a coordinate plane. The Cartesian plane uses an x-axis (horizontal) and a y-axis (vertical) intersecting at the origin (0,0). Points are identified by ordered pairs (x, y).

Key formulas in coordinate geometry include:

- **Distance Formula:** The distance d between (x_1, y_1) and (x_2, y_2) is $d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$.
- **Midpoint Formula:** The midpoint M of a segment connecting (x_1, y_1) and (x_2, y_2) is $((x_1 + x_2)/2, (y_1 + y_2)/2)$.
- **Slope of a Line:** The slope m of a line through (x_1, y_1) and (x_2, y_2) is $m = (y_2 - y_1) / (x_2 - x_1)$. Slope indicates steepness and direction.
- **Equation of a Line:** The slope-intercept form, $y = mx + b$, uses m for slope and b for the y -intercept. The point-slope form is $y - y_1 = m(x - x_1)$.

Parallel lines have the same slope. Perpendicular lines have slopes that are negative reciprocals. For example, a line with slope $2/3$ is perpendicular to a line with slope $-3/2$.

Figure geometry deals with shapes, sizes, and properties of figures. Angles are formed by two rays sharing an endpoint. Common angle types are acute (less than 90 degrees), right (90 degrees), obtuse (greater than 90 degrees), and straight (180 degrees). Vertical angles are equal. Angles on a straight line sum to 180 degrees.

When a transversal line intersects two parallel lines, alternate interior, alternate exterior, and corresponding angles are equal. Consecutive interior angles sum to 180 degrees.

Triangles are three-sided polygons. The sum of their interior angles is 180 degrees.

- **Types of triangles:** Equilateral (all sides equal, all angles 60 degrees), Isosceles (two sides equal, two angles equal), Scalene (all sides different, all angles different).
- **Right triangles:** Contain one 90-degree angle. The Pythagorean theorem states $a^2 + b^2 = c^2$ for legs a , b and hypotenuse c . Common Pythagorean triples include (3, 4, 5) and (5, 12, 13).
- **Special Right Triangles:** 45-45-90 triangles have sides in ratio $x : x : x * \sqrt{2}$. 30-60-90 triangles have sides in ratio $x : x * \sqrt{3} : 2x$.

Quadrilaterals are four-sided polygons. Their interior angles sum to 360 degrees. Squares, rectangles, parallelograms, rhombuses, and trapezoids are common types. Each has specific properties for side lengths, angle measures, and diagonals. For instance, the area of a rectangle is $\text{length} * \text{width}$.

Circles are sets of points equidistant from a central point. Key terms include radius, diameter ($2 * \text{radius}$), circumference ($C = 2 * \pi * r$ or $C = \pi * d$), and area ($A = \pi * r^2$). An arc is a portion of the circumference. A sector is a portion of the area.

Polygons are closed figures with straight sides. For an n -sided polygon, the sum of its interior angles is $(n - 2) * 180$ degrees. Regular polygons have equal sides and angles.

Three-dimensional figures have length, width, and height.

- **Rectangular Solids:** Volume $V = \text{length} * \text{width} * \text{height}$. Surface area $SA = 2(lw + lh + wh)$.
- **Cylinders:** Volume $V = \pi * r^2 * h$. Surface area $SA = 2 * \pi * r^2 + 2 * \pi * r * h$.

Always draw diagrams for geometry problems. Label known values and identify what you need to find. Pay attention to units of measurement.

Quantitative Comparison, Inequalities, and Absolute Values

Covers: GRE Quant Ep 6: Algebra, Logic & Number Picking in Quantitative Comparison • GRE Quant Ep 7: Inequalities & Absolute Values

Quantitative Comparison (QC) questions are unique to the GRE. They present two quantities, Quantity A and Quantity B, and ask you to compare them. The four possible answer choices are always the same: (A) Quantity A is greater. (B) Quantity B is greater. (C) The two quantities are equal. (D) The relationship cannot be determined from the information given.

The key to QC questions is efficiency. Do not calculate exact values if a comparison can be made more quickly. Simplify both quantities as much as possible. Look for common terms or factors that can be cancelled from both sides (similar to solving an equation, but be careful with inequalities).

One powerful strategy is **number picking**. Test various types of numbers for variables: positive integers, negative integers, zero, fractions between 0 and 1, and fractions less than -1. If you pick a number and Quantity A is greater, then pick another number and Quantity B is greater, the answer must be (D). If the relationship holds true for several different types of numbers, you might be able to confidently choose A, B, or C. However, one counterexample is enough to rule out A, B, or C.

Example:

Quantity A: x^2

Quantity B: x

1. If $x = 2$, $A = 4$, $B = 2$. $A > B$.
2. If $x = 1/2$, $A = 1/4$, $B = 1/2$. $B > A$.

Since the relationship changed, the answer is (D).

Another strategy is to treat the comparison like an inequality. Subtract Quantity B from Quantity A and see if the result is always positive, always negative, or sometimes positive and sometimes negative.

Inequalities express a relationship where two quantities are not necessarily equal. They use symbols like $<$ (less than), $>$ (greater than), $\leq$ (less than or equal to), and $\geq$ (greater than or equal to). Solving inequalities is similar to solving equations, with one critical difference: when you multiply or divide both sides of an inequality by a negative number, you must reverse the direction of the inequality sign.

Example: Solve for x : $-3x + 5 < 17$

1. Subtract 5 from both sides: $-3x < 12$.
2. Divide by -3 and reverse the inequality sign: $x > -4$.

Compound inequalities involve more than one inequality statement, often connected by "and" or "or." For example, $-2 < x \leq 5$ means x is greater than -2 AND x is less than or equal to 5. The solution set is the intersection of the individual inequalities.

Absolute value represents the distance of a number from zero on the number line, regardless of direction. It is always non-negative. The absolute value of x is denoted as $|x|$.

- If $x \geq 0$, then $|x| = x$.
- If $x < 0$, then $|x| = -x$.

To solve absolute value equations, consider two cases. For $|x| = k$ (where $k \geq 0$), then $x = k$ or $x = -k$.

Example: Solve $|2x - 1| = 7$

Case 1: $2x - 1 = 7 \Rightarrow 2x = 8 \Rightarrow x = 4$

Case 2: $2x - 1 = -7 \Rightarrow 2x = -6 \Rightarrow x = -3$

The solutions are $x = 4$ and $x = -3$.

To solve absolute value inequalities:

- For $|x| < k$ (where $k > 0$), it means $-k < x < k$.
- For $|x| > k$ (where $k > 0$), it means $x < -k$ or $x > k$.

Understanding these rules for inequalities and absolute values is crucial for accurately solving a range of GRE problems. Always remember to reverse the sign when multiplying or dividing by a negative number in inequalities.

KEY TAKEAWAYS

- The GRE Quant section assesses foundational math skills across Problem Solving, Quantitative Comparison, Numeric Entry, and Data Interpretation question types.
- A strong command of arithmetic operations, algebraic manipulation, and exponent rules is fundamental to all GRE quantitative problems.
- Coordinate and figure geometry require knowledge of specific formulas and properties for lines, angles, triangles, quadrilaterals, circles, and 3D shapes.
- Quantitative Comparison questions demand strategic thinking, including simplifying quantities, testing numbers, and recognizing when a relationship cannot be determined.
- Solving inequalities requires careful attention to reversing the inequality sign when multiplying or dividing by a negative number.
- Absolute values represent distance from zero and solving related equations or inequalities involves considering both positive and negative cases.

CHECK YOUR UNDERSTANDING

Answer these before moving on. Model answers are in the Answer Key at the back of this guide.

1. What are the four main question types found in the GRE Quantitative Reasoning section?
2. When solving an inequality, under what specific condition must you reverse the direction of the inequality sign?
3. Describe the primary strategy of 'number picking' in Quantitative Comparison questions.

4. What is the relationship between the slopes of two perpendicular lines in coordinate geometry?
5. Explain the meaning of a negative exponent, such as b^{-n} .

CHAPTER 2

Data Analysis and Advanced Problem Solving

This chapter focuses on essential quantitative reasoning skills for the GRE. You will learn to interpret various data displays, understand fundamental statistical concepts, and approach different types of word problems. The material also covers strategies for counting, sequences, functions, and interpreting unfamiliar mathematical symbols. Mastering these topics is crucial for success on the quantitative section of the GRE.

A strong grasp of these concepts allows you to analyze information efficiently and solve complex problems accurately. This chapter provides the tools and techniques needed to tackle questions involving data interpretation, statistical analysis, and advanced algebraic reasoning. Practice these methods to build speed and confidence.

Data Interpretation and Statistics

Covers: GRE Quant Ep 8: Data Interpretation · GRE Quant Ep 9: Statistics Part 1 · GRE Quant Ep 10: Statistics Part II

This section addresses how to extract and analyze information from various visual data displays. It also covers the core statistical measures frequently tested on the GRE. Data Interpretation questions often present information in tables, bar graphs, line graphs, or pie charts. Your task is to accurately read these displays and perform calculations based on the data. Always pay close attention to titles, labels, units, and any footnotes. Misreading these details is a common source of error. For example, if a graph shows sales in "thousands of dollars," remember to multiply your final calculation by 1,000.

When approaching data interpretation questions, first skim the entire display to understand what information is presented. Then, read each question carefully to identify exactly what is being asked. Sometimes, questions require you to combine data from multiple sources or perform multi-step calculations. Practice estimating answers when possible, as precise calculations are not always necessary.

Basic Statistical Measures

Statistics questions on the GRE typically focus on understanding central tendency and spread. The most common measures are mean, median, mode, and range.

- **Mean (Average):** The sum of all values divided by the number of values.

$$\text{Mean} = (\text{Sum of values}) / (\text{Number of values})$$

Example: The mean of 2, 4, 6, 8 is $(2+4+6+8)/4 = 20/4 = 5$.

- **Median:** The middle value in a set of numbers arranged in ascending or descending order. If there is an even number of values, the median is the average of the two middle numbers. Example: For 2, 4, 6,

8, the median is $(4+6)/2 = 5$. For 2, 4, 5, 6, 8, the median is 5.

- **Mode:** The value that appears most frequently in a set. A set can have one mode, multiple modes, or no mode. Example: For 2, 4, 4, 6, 8, the mode is 4. For 2, 2, 4, 4, 6, both 2 and 4 are modes.
- **Range:** The difference between the highest and lowest values in a set. Example: For 2, 4, 6, 8, the range is $8 - 2 = 6$.

Advanced Statistical Concepts

You should also understand weighted averages, percentiles, and the concept of standard deviation.

- **Weighted Average:** Used when different values contribute differently to the overall average. Each value is multiplied by its weight, summed, and then divided by the sum of the weights. Example: A student scores 80 on a quiz worth 20% and 90 on an exam worth 80%. The weighted average is $(80 * 0.20 + 90 * 0.80) / (0.20 + 0.80) = (16 + 72) / 1 = 88$.
- **Percentiles:** Indicate the percentage of values in a data set that are less than or equal to a particular value. If a score is in the 80th percentile, it means 80% of the scores are at or below that score.
- **Standard Deviation:** A measure of the spread or dispersion of a set of data around its mean. A low standard deviation indicates that data points are generally close to the mean. A high standard deviation indicates that data points are spread out over a wider range of values. You do not need to calculate standard deviation on the GRE, but you must understand its meaning. Comparing two data sets, the one with values more clustered around its mean will have a lower standard deviation.

Practice working with data sets that include missing values or require you to infer information. Many GRE problems combine these statistical concepts with data interpretation visuals. Always double-check your calculations, especially when dealing with percentages or large numbers.

Word Problems, Ratios, Percentages, and Rates

Covers: GRE Quant Ep 11: Word Problems · GRE Quant Ep 13: Ratios and Percentages · GRE Quant Ep 14: Conversions & Rates

Word problems are a cornerstone of the GRE Quant section. They test your ability to translate real-world scenarios into mathematical expressions and solve them. The key to mastering word problems is a systematic approach. First, read the problem carefully to understand the question and identify all given information. Define variables for unknown quantities. Then, translate the words into an equation or a system of equations. Solve the equations and check if your answer makes sense in the context of the problem.

Ratios and Percentages

Ratios compare two or more quantities. A ratio of A to B can be written as A:B, A/B, or "A to B." Ratios can represent parts of a whole or comparisons between distinct groups. When working with ratios, ensure the units are consistent. If a problem states a ratio of 3:5 for boys to girls in a class of 40 students, you can set up an equation: $3x + 5x = 40$, which means $8x = 40$, so $x = 5$. There are $3(5) = 15$ boys and $5(5) = 25$ girls.

Percentages are a specific type of ratio, expressing a part per one hundred. "Percent" means "per 100." To convert a percentage to a decimal, divide by 100. To convert a decimal to a percentage, multiply by 100.

- **Percentage Increase/Decrease:**

$$\text{Percent Change} = ((\text{New Value} - \text{Original Value}) / \text{Original Value}) * 100\%$$

Example: A price increases from \$50 to \$60. The percent increase is $((60-50)/50) * 100\% = (10/50) * 100\% = 0.20 * 100\% = 20\%$.

- **Successive Percentages:** When an item undergoes multiple percentage changes, do not simply add or subtract the percentages. Apply each change sequentially. Example: A \$100 item increases by 10%, then decreases by 10%. First increase: $\$100 * 1.10 = \110 . Then decrease: $\$110 * 0.90 = \99 . The final price is \$99, not \$100.

Conversions and Rates

Conversions involve changing units of measurement. You must know common conversion factors, such as those for time (minutes to hours), length (inches to feet), and currency. If a conversion factor is not common knowledge, the GRE will provide it. Set up conversion problems using dimensional analysis, where units cancel out. Example: Convert 30 miles per hour to feet per second.

$$(30 \text{ miles}/1 \text{ hour}) * (5280 \text{ feet}/1 \text{ mile}) * (1 \text{ hour}/60 \text{ minutes}) * (1 \text{ minute}/60 \text{ seconds})$$

Units cancel: miles, hours, minutes. Result: $(30 * 5280) / (60 * 60) \text{ feet/second} = 158400 / 3600 \text{ feet/second} = 44 \text{ feet/second}$.

Rates describe how one quantity changes in relation to another. Common rate problems involve distance, speed, and time ($D = RT$) or work and rate.

- **Work-Rate Problems:** If a person completes a job in T hours, their rate is $1/T$ job per hour. If two people work together, their rates add up. Example: Person A does a job in 3 hours, Person B in 6 hours. Their combined rate is $1/3 + 1/6 = 2/6 + 1/6 = 3/6 = 1/2$ job per hour. Working together, they complete the job in $1 / (1/2) = 2$ hours.

Always be mindful of units in rate problems. Ensure all quantities are expressed in consistent units before performing calculations. For instance, if speed is in miles per hour, time should be in hours, and distance in miles.

Counting, Sequences, Functions, and Symbols

Covers: GRE Quant Ep 12: Counting & Sequences · GRE Quant Ep 15: Functions & Intimidating Symbols

This final section covers topics that often appear less frequently but can be challenging. These include counting principles, sequences, functions, and understanding arbitrary mathematical symbols.

Counting Principles

Counting problems determine the number of possible arrangements or selections. The **Fundamental Counting Principle** states that if there are m ways to do one thing and n ways to do another, then there are $m * n$ ways to do both. Example: A restaurant offers 3 appetizers and 5 main courses. There are $3 * 5 = 15$ possible appetizer-main course combinations.

- **Permutations:** Used when the order of selection matters. The number of permutations of n distinct items taken k at a time is given by:

$$P(n, k) = n! / (n - k)!$$

Example: How many ways can 3 students be chosen from a group of 5 to fill the roles of President, Vice President, and Secretary? Order matters. $P(5, 3) = 5! / (5 - 3)! = 5! / 2! = (5 * 4 * 3 * 2 * 1) / (2 * 1) = 60$ ways.

- **Combinations:** Used when the order of selection does not matter. The number of combinations of n distinct items taken k at a time is given by:

$$C(n, k) = n! / (k! * (n - k)!)$$

Example: How many ways can 3 students be chosen from a group of 5 to form a committee? Order does not matter. $C(5, 3) = 5! / (3! * (5 - 3)!) = 5! / (3! * 2!) = (5 * 4 * 3 * 2 * 1) / ((3 * 2 * 1) * (2 * 1)) = 10$ ways.

A key challenge is distinguishing between permutations and combinations. Ask yourself: "Does the order of selection change the outcome?" If yes, use permutations. If no, use combinations.

Sequences

A sequence is an ordered list of numbers. The GRE typically tests arithmetic and geometric sequences.

- **Arithmetic Sequence:** Each term is found by adding a constant value (the common difference) to the previous term. Example: 2, 5, 8, 11... (common difference = 3) The n th term: $a_n = a_1 + (n - 1)d$, where a_1 is the first term and d is the common difference.
- **Geometric Sequence:** Each term is found by multiplying the previous term by a constant value (the common ratio). Example: 2, 6, 18, 54... (common ratio = 3) The n th term: $a_n = a_1 * r^{(n-1)}$, where a_1 is the first term and r is the common ratio.

Practice identifying the type of sequence and finding specific terms or sums.

Functions and Intimidating Symbols

Functions are relationships where each input has exactly one output. Function notation, such as $f(x)$, means "the value of the function f at x ." To evaluate $f(x)$ for a specific value, substitute that value for x in the function's definition. Example: If $f(x) = 2x + 3$, then $f(5) = 2(5) + 3 = 10 + 3 = 13$.

The GRE may also introduce "intimidating symbols" or defined operations. These are new mathematical operations defined within the problem itself. Your task is to understand the definition and apply it

correctly. Example: Define a new operation $x \Delta y = x^2 - y$. What is $5 \Delta 2$? Substitute the values: $5 \Delta 2 = 5^2 - 2 = 25 - 2 = 23$. These problems test your ability to follow instructions precisely, not your knowledge of advanced mathematics. Do not overthink these symbols; simply apply the given rule.

KEY TAKEAWAYS

- Carefully read all labels, units, and scales in data interpretation questions to avoid miscalculations.
- Understand the definitions of mean, median, mode, range, and the conceptual meaning of standard deviation.
- Translate word problems into algebraic equations systematically, defining variables clearly.
- Apply percentage changes sequentially, especially for successive increases or decreases.
- Distinguish between permutations (order matters) and combinations (order does not matter) in counting problems.
- For defined operations with unfamiliar symbols, strictly follow the provided rule.

CHECK YOUR UNDERSTANDING

Answer these before moving on. Model answers are in the Answer Key at the back of this guide.

1. A bar graph shows the number of students enrolled in four different courses: Math (120), Science (90), English (150), History (60). What percentage of the total student enrollment is in the Science course?
2. A set of numbers is $\{10, 15, 5, 20, 15\}$. Find the mean, median, and mode for this set.
3. A shirt originally priced at \$40 is discounted by 25%. Then, an additional 10% discount is applied to the sale price. What is the final price of the shirt?
4. How many different 3-digit numbers can be formed using the digits 1, 2, 3, 4, 5 if no digit can be repeated?
5. If a function is defined as $f(x) = x^2 - 3x + 1$, what is the value of $f(-2)$?

CHAPTER 3

Quantitative Reasoning: Number Properties, Counting, and Probability

This chapter provides a comprehensive review of essential quantitative reasoning topics frequently tested on the GRE. We begin by solidifying your understanding of number properties, including integers, primes, factors, and multiples. Mastering these foundational concepts is crucial for solving a wide range of GRE problems efficiently.

Next, we transition to the principles of counting and probability. This section covers strategies for handling overlapping sets, distinguishing between permutations and combinations, and calculating probabilities for various scenarios. A strong grasp of these areas will equip you to tackle complex problems involving selections, arrangements, and the likelihood of events.

Number Properties: The Building Blocks of Quant

Covers: GRE Quant Ep 16: Number Properties (video, 1 hr 12 min)

Number properties form the backbone of many GRE quantitative questions. A solid understanding allows you to simplify complex problems and avoid unnecessary calculations. We will focus on key definitions and rules.

Integers, Even, and Odd Numbers

Integers are whole numbers, including positive numbers, negative numbers, and zero. Examples are -3, 0, 5, and 100. Numbers with fractional or decimal parts are not integers.

Even integers are divisible by 2. Odd integers are not divisible by 2. Zero is an even integer. Negative integers can also be even or odd, such as -2 (even) or -3 (odd).

Rules for operations with even (E) and odd (O) numbers are vital:

- $E + E = E$
- $O + O = E$
- $E + O = O$
- $E * E = E$
- $O * O = O$
- $E * O = E$

These rules apply to subtraction as well. For division, the result is not always an integer, so these rules do not apply directly.

Positive and Negative Numbers

Understanding how signs interact during operations is fundamental:

- Positive + Positive = Positive
- Negative + Negative = Negative
- Positive + Negative: The sign depends on the magnitude of the numbers. For example, $5 + (-2) = 3$ (positive), but $2 + (-5) = -3$ (negative).
- Positive * Positive = Positive
- Negative * Negative = Positive
- Positive * Negative = Negative

These multiplication rules also apply to division.

Prime and Composite Numbers

A prime number is a natural number greater than 1 that has no positive divisors other than 1 and itself. The first few prime numbers are 2, 3, 5, 7, 11, 13, and so on. Note that 2 is the only even prime number. The number 1 is neither prime nor composite.

A composite number is a natural number greater than 1 that is not prime. It can be formed by multiplying two smaller positive integers. Examples include 4, 6, 8, 9, 10.

Factors and Multiples

A factor of an integer n is an integer that divides n evenly, leaving no remainder. For example, the factors of 12 are 1, 2, 3, 4, 6, and 12.

A multiple of an integer n is any integer that can be obtained by multiplying n by another integer. For example, multiples of 3 are 3, 6, 9, 12, and so on (and also 0, -3, -6, etc.).

Prime Factorization

Every composite number can be expressed as a unique product of prime numbers. This is called its prime factorization. For example:

$$\begin{aligned}
 72 &= 2 * 36 \\
 &= 2 * 2 * 18 \\
 &= 2 * 2 * 2 * 9 \\
 &= 2 * 2 * 2 * 3 * 3 \\
 &= 2^3 * 3^2
 \end{aligned}$$

Prime factorization is useful for finding the Greatest Common Divisor (GCD) and the Least Common Multiple (LCM) of two or more numbers.

Greatest Common Divisor (GCD)

The GCD of two or more integers is the largest positive integer that divides each of the integers without a remainder. To find the GCD of 24 and 36:

1. Prime factorize each number:

- $24 = 2^3 * 3^1$
- $36 = 2^2 * 3^2$

2. Take the lowest power of each common prime factor:

- Common factors are 2 and 3.
- Lowest power of 2 is 2^2 .
- Lowest power of 3 is 3^1 .

3. Multiply these lowest powers: $2^2 * 3^1 = 4 * 3 = 12$. So, $\text{GCD}(24, 36) = 12$.

Least Common Multiple (LCM)

The LCM of two or more integers is the smallest positive integer that is a multiple of all the integers. To find the LCM of 24 and 36:

1. Prime factorize each number (as above).

2. Take the highest power of all prime factors present in either number:

- Highest power of 2 is 2^3 .
- Highest power of 3 is 3^2 .

3. Multiply these highest powers: $2^3 * 3^2 = 8 * 9 = 72$. So, $\text{LCM}(24, 36) = 72$.

Divisibility Rules

Knowing common divisibility rules can save time:

- **By 2:** If the last digit is even (0, 2, 4, 6, 8).
- **By 3:** If the sum of the digits is divisible by 3.
- **By 4:** If the number formed by the last two digits is divisible by 4.
- **By 5:** If the last digit is 0 or 5.
- **By 6:** If the number is divisible by both 2 and 3.
- **By 9:** If the sum of the digits is divisible by 9.
- **By 10:** If the last digit is 0.

Practice Cue: Create your own number property problems. For instance, pick two numbers and find their prime factorization, GCD, and LCM. Test various combinations of even/odd and positive/negative numbers in operations to confirm the rules.

Counting and Probability: Strategies for Likelihood and Arrangements

Covers: GRE Quant Ep 17: Overlapping Sets (video, 38 min) · GRE Quant Ep 18: Combinations & Permutations (video, 56 min) · GRE Quant Ep 19: Probability (video, 48 min)

This section covers methods for counting possibilities and determining the likelihood of events. These are common GRE topics that require careful attention to detail.

Overlapping Sets

Problems involving overlapping sets typically ask about groups with shared members. Venn diagrams are excellent tools for visualizing these situations. The Principle of Inclusion-Exclusion helps calculate the total number of elements in a union of sets.

For two sets, A and B, the formula is: $\text{Total} = (\text{Number in A}) + (\text{Number in B}) - (\text{Number in Both A and B}) + (\text{Number in Neither A nor B})$

Alternatively, if you are given the total number of items and want to find the 'neither' category: $\text{Total} = A + B - \text{Both} + \text{Neither}$ $\text{Neither} = \text{Total} - (A + B - \text{Both})$

Example: In a class of 30 students, 17 take French, 15 take Spanish, and 6 take both. How many students take neither French nor Spanish?

1. Students taking French only: $17 - 6 = 11$
2. Students taking Spanish only: $15 - 6 = 9$
3. Students taking at least one language: $11 + 9 + 6 = 26$
4. Students taking neither: $30 - 26 = 4$

Using the formula: $\text{Total} = \text{French} + \text{Spanish} - \text{Both} + \text{Neither}$ $30 = 17 + 15 - 6 + \text{Neither}$ $30 = 32 - 6 + \text{Neither}$ $30 = 26 + \text{Neither}$ $\text{Neither} = 30 - 26 = 4$

Combinations and Permutations

These concepts deal with counting the number of ways to select or arrange items from a larger group. The key distinction is whether order matters.

Permutations: Order matters. Use permutations when arranging items or selecting items for specific ordered positions. The number of permutations of k items chosen from a set of n items is given by: $P(n, k) = n! / (n - k)!$

Where $n!$ (n factorial) is $n * (n-1) * (n-2) * \dots * 1$. Note that $0! = 1$.

Example: How many ways can 3 different books be arranged on a shelf from a selection of 5 books? Here, $n = 5$ (total books) and $k = 3$ (books to arrange). Order matters. $P(5, 3) = 5! / (5 - 3)! = 5! / 2! = (5 * 4 * 3 * 2 * 1) / (2 * 1) = 120 / 2 = 60$ ways.

Combinations: Order does not matter. Use combinations when selecting a group of items where the arrangement within the group is irrelevant. The number of combinations of k items chosen from a set of n items is given by: $C(n, k) = n! / (k! * (n - k)!)$

Example: How many ways can a committee of 3 people be chosen from a group of 5 people? Here, $n = 5$ (total people) and $k = 3$ (people to choose). Order does not matter. $C(5, 3) = 5! / (3! * (5 - 3)!) = 5! / (3! * 2!) = (5 * 4 * 3 * 2 * 1) / ((3 * 2 * 1) * (2 * 1)) = 120 / (6 * 2) = 120 / 12 = 10$ ways.

Common Mistake: Confusing when to use permutations versus combinations. If the problem involves roles, positions, or arrangements, it is likely a permutation. If it involves forming a group or selection where all members are equal, it is a combination.

Probability

Probability quantifies the likelihood of an event occurring. It is expressed as a ratio: $\text{Probability of an event} = (\text{Number of favorable outcomes}) / (\text{Total number of possible outcomes})$

Probabilities range from 0 (impossible event) to 1 (certain event).

Example: What is the probability of rolling an even number on a standard six-sided die?

- Favorable outcomes (even numbers): 2, 4, 6 (3 outcomes)
- Total possible outcomes: 1, 2, 3, 4, 5, 6 (6 outcomes)
- Probability = $3 / 6 = 1/2$

Independent and Dependent Events

- **Independent Events:** The outcome of one event does not affect the outcome of another. For example, flipping a coin twice. The probability of both A and B occurring is $P(A \text{ and } B) = P(A) * P(B)$.
- **Dependent Events:** The outcome of one event affects the outcome of another. For example, drawing cards from a deck without replacement. The probability of both A and B occurring is $P(A \text{ and } B) = P(A) * P(B|A)$, where $P(B|A)$ is the probability of B given that A has occurred.

'OR' Probability

For events A and B, the probability of A or B occurring is: $P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$. If A and B are mutually exclusive (cannot happen at the same time), then $P(A \text{ and } B) = 0$, so $P(A \text{ or } B) = P(A) + P(B)$.

Complementary Probability

The probability that an event does NOT occur is 1 minus the probability that it does occur: $P(\text{not } A) = 1 - P(A)$

Practice Cue: Work through problems that require you to identify whether order matters or not. Try to solve overlapping sets problems using both Venn diagrams and the formula to ensure you understand both approaches.

KEY TAKEAWAYS

- Master the properties of integers, including rules for even/odd and positive/negative numbers in operations.
- Utilize prime factorization to efficiently find factors, multiples, Greatest Common Divisor (GCD), and Least Common Multiple (LCM).
- Apply the Principle of Inclusion-Exclusion or Venn diagrams to solve problems involving overlapping sets.
- Distinguish clearly between permutations (order matters) and combinations (order does not matter) when counting arrangements or selections.
- Calculate basic probability as the ratio of favorable outcomes to total possible outcomes.
- Understand how to combine probabilities for independent, dependent, and mutually exclusive events.
- Use complementary probability to find the likelihood of an event not occurring.

CHECK YOUR UNDERSTANDING

Answer these before moving on. Model answers are in the Answer Key at the back of this guide.

1. How do you determine if a large number is divisible by 3 and 9?
2. Explain the difference between a permutation and a combination. Provide an example for each.
3. What is the formula for calculating the number of elements in the union of two sets, A and B, when some elements overlap?
4. If the probability of event A is 0.6, what is the probability that event A does not occur?
5. Find the GCD and LCM of 24 and 36.

CHAPTER 4

Quant Toolkit

Chapter 4 provides essential tools and strategies for success on the GRE Quantitative Reasoning section. This chapter serves as a foundational toolkit, covering the distinct question formats you will encounter, refreshing critical arithmetic concepts like percents and ratios, and outlining an effective approach to practice and error analysis. Mastering these fundamental elements is crucial for building the advanced problem-solving skills tested on the GRE.

By the end of this chapter, you will understand how to approach each question type strategically, confidently handle common quantitative concepts, and use official practice materials to identify and correct your specific weaknesses.

GRE Quant Question Types and Core Concepts

Covers: Anatomy of GRE Quant · Percent and Ratio Refresher

The GRE Quantitative Reasoning section presents 27 questions across two sections, utilizing four distinct question formats. Each format rewards a specific strategic approach. Understanding these formats and their nuances is the first step to mastering the section.

1. Quantitative Comparison (QC)

In Quantitative Comparison questions, you compare Quantity A and Quantity B. Your choices are: Quantity A is greater, Quantity B is greater, the two quantities are equal, or the relationship cannot be determined. The fourth option, "cannot be determined," is central to this format. Your goal is not always to compute exact values for both quantities. Instead, you must decide if the relationship between them is *forced* or if it can change under different valid conditions.

Two powerful strategies for QC questions are:

- **Test adversarial numbers.** If variables are involved, test a range of values. Start with a normal positive integer, then try zero, a negative number, and a fraction between 0 and 1. If the relationship between Quantity A and Quantity B flips even once (for example, $A > B$ for one number but $A < B$ for another), then the answer is "the relationship cannot be determined."
- **Do the same thing to both sides.** You can add or subtract the same value from both quantities without changing their relationship. If the values are known to be positive, you can also multiply or divide both quantities by the same positive value. This simplifies the comparison, much like solving an inequality.

2. Multiple Choice, One Answer

This is the familiar format where you select one correct answer from five options. Often, backsolving by testing the answer choices or estimating based on the answer spread can be faster than performing a full algebraic calculation.

3. Multiple Choice, One or More Answers

For these questions, you must select *every* correct choice. There is no partial credit. You must check each option independently. Never stop after finding the first correct answer; continue evaluating all choices.

4. Numeric Entry

In Numeric Entry questions, you type your answer directly into a box. Since there are no choices to backsolve from, your arithmetic must be precise. The on-screen calculator is helpful here. Before submitting your answer, always re-read the question stem carefully. Pay close attention to units, rounding instructions, and any "in terms of" phrasing, as these details cause more errors than the underlying math.

Data Interpretation Sets

Each section typically includes a cluster of questions related to charts, graphs, or tables. Before attempting the questions, spend 20 to 30 seconds reading the titles, axes, units, and footnotes of the data display. Misreading axes or units is a common pitfall in Data Interpretation.

The Calculator: A Tool, Not a Crutch

The on-screen calculator is designed to handle complicated arithmetic. However, it can tempt you into unnecessary computation when estimation or comparison would be faster. A good rule of thumb: if a Quantitative Comparison or Data Interpretation question seems to require extensive calculation, you have likely missed a shortcut built into the problem.

Percents: One Mental Model

The word 'percent' means 'per hundred.' Every percent statement can be expressed as the equation: **part = percent x whole**. The 'percent' value must be converted to its decimal equivalent (for example, 40% becomes 0.40).

Here are some examples:

- **Find the part:** What is 40% of 250? $0.40 * 250 = 100$
- **Find the percent:** 18 is what percent of 60? $18 / 60 = 0.30 = 30\%$
- **Find the whole:** 35 is 25% of what number? $35 / 0.25 = 140$

Percent Change: Where the Traps Live

Calculating percent change requires careful attention to the original value. The formula is: **Percent change = (new - old) / old**. The denominator is always the *original* value.

Common pitfalls:

- **Successive percent changes do not cancel out.** A 20% increase followed by a 20% decrease does not return to the starting value. If you start with 100, a 20% increase makes it 120. A 20% decrease on 120 is $0.20 * 120 = 24$, so the new value is $120 - 24 = 96$. Successive percent changes multiply: $1.20 * 0.80 = 0.96$ (meaning 96% of the original).
- **Direction matters.** If X is 25% greater than Y, this means $X = 1.25Y$. It does NOT mean that Y is 25% less than X. (In fact, Y is 20% less than X, because the base changes).

- **Percentage points vs. percent.** Moving from 10% to 15% represents a rise of 5 percentage points. However, it is a 50 percent increase ($(15 - 10) / 10 = 0.50 = 50\%$).

Ratios: Parts of a Whole

A ratio of 3:5 means that for some multiplier 'x', the quantities are 3x and 5x. The total 'whole' is $3x + 5x = 8x$. For example, if red and blue marbles are in a ratio of 3:5 and there are 40 marbles total, then $8x = 40$, so $x = 5$. This means there are 15 red marbles ($3 * 5$) and 25 blue marbles ($5 * 5$). Writing quantities as '3x' and '5x' converts most ratio problems into straightforward algebra.

Combining Ratios

To combine ratios like $a:b = 2:3$ and $b:c = 4:5$, find a common multiple for the shared term (b). The least common multiple of 3 and 4 is 12. Scale both ratios so 'b' becomes 12:

- $a:b = 2:3$ becomes 8:12 (multiply by 4)
- $b:c = 4:5$ becomes 12:15 (multiply by 3) This gives a combined ratio of $a:b:c = 8:12:15$.

Rates: Ratios With Units

Rates relate quantities with different units, such as distance per time (speed) or work per time. The fundamental formulas are: Distance = rate x time and Work = rate x time.

For combined work problems, you must add the rates, not the times. For example, if one machine completes a job in 4 hours (rate = $1/4$ job per hour) and another in 6 hours (rate = $1/6$ job per hour), their combined rate is $1/4 + 1/6 = 3/12 + 2/12 = 5/12$ job per hour. To find the time they need together, take the reciprocal of the combined rate: $12/5$ hours.

Strategic Practice and Error Analysis

Covers: Your Official (Free) Practice Arsenal

Effective GRE preparation requires consistent practice. However, not all practice is equally valuable. It is crucial to calibrate your understanding and skills against official questions from ETS (Educational Testing Service), the creators of the GRE. Third-party practice materials, including those in this course, can sometimes deviate from the authentic GRE experience, often featuring harder arithmetic but simpler logic. Regular exposure to official questions ensures you are preparing for the actual test.

Your Official (Free) Practice Arsenal

ETS provides several high-quality, free resources:

- **POWERPREP Online:** This offers two full-length practice tests that simulate the authentic GRE interface, including the real on-screen calculator. These tests are invaluable for gauging your current performance and building stamina. Save the second test for your final two weeks of preparation.
- **Official sample quant questions:** ETS provides sample questions with explanations for all four question formats on their GRE preparation pages.
- **Official guides (paid):** If you exhaust the free materials, the *Official GRE Quantitative Reasoning* volume contains hundreds of retired questions for further practice.

Reading Your Practice Data

After completing any timed practice set, it is essential to review every question, especially those you missed or struggled with. Classify each error into one of three categories:

1. **Content Gap:** You could not have solved the problem even if you had unlimited time. This indicates a fundamental lack of understanding of the mathematical concept being tested. The fix for a content gap is to revisit the relevant lessons in this course and then drill that specific topic until it is solid.
2. **Method Miss:** You could have solved the problem if given more time, but you chose an inefficient or overly complicated approach. For example, you might have used complex algebra when testing numbers or estimating would have been much faster. The fix here is to drill strategy selection, not content. Focus on recognizing when to apply shortcuts and alternative methods.
3. **Careless Slip:** You knew how to solve the problem and understood the method, but made a simple mistake (for example, a calculation error, misreading a number, or failing to answer the specific question asked). Most 'careless' errors are not random; they are often repeated bad habits. The fix is to develop a personal checklist. This might include steps like re-reading the question stem, checking units, confirming which quantity the question asks for, or double-checking calculator entries. Identifying your specific recurring careless error allows you to target and eliminate it.

Two weeks of honest classification usually reveals that one category dominates your errors. Each category demands a completely different cure, so accurate classification is key to efficient improvement.

Timing Benchmarks

Time management is critical on the GRE Quant section. Aim for an average of 1 minute 45 seconds per question. Establish a personal cap of three minutes on any single question. If you are approaching that limit, make an educated guess and move on. For Quantitative Comparison questions, most should resolve in under a minute once the habit of testing adversarial numbers becomes automatic. Strategic test-takers bank time early in the section. The Data Interpretation cluster, which often appears later in each section, is typically where those banked minutes are spent, as these questions can sometimes require more time to analyze the charts and tables.

KEY TAKEAWAYS

- The GRE Quant section features four question types, each requiring distinct strategies for efficient problem-solving.
- For Quantitative Comparison questions, focus on determining if the relationship is *forced* by testing adversarial numbers and simplifying both quantities.
- Percents and ratios are fundamental concepts that appear across various question formats, including Data Interpretation.
- Percent change calculations are prone to error; always ensure the denominator is the original value and be aware of successive changes.
- Official ETS materials (POWERPREP, sample questions) are the most authentic resources for practice and should be used regularly.
- Classify your practice errors into 'Content Gap,' 'Method Miss,' or 'Careless Slip' to identify the root cause of mistakes and guide your study.
- Aim for an average of 1 minute 45 seconds per question, banking time early to spend on Data Interpretation sets.

CHECK YOUR UNDERSTANDING

Answer these before moving on. Model answers are in the Answer Key at the back of this guide.

1. Describe the core strategy for Quantitative Comparison questions.
2. Explain the 'part = percent x whole' mental model and provide an example.
3. Why does a 20% increase followed by a 20% decrease not return to the original value?
4. What are the three categories for classifying practice errors, and why is this classification important?
5. What is the recommended average time per question for GRE Quant, and where should students plan to spend banked time?

CHAPTER 5

Final Assessment: GRE Quant Strategy

This chapter marks a significant milestone in your GRE Quant preparation. Module 5 is dedicated to the Final Assessment, a comprehensive quiz designed to evaluate your mastery of all quantitative reasoning concepts covered in this bootcamp. This assessment provides a realistic simulation of the GRE Quant section, allowing you to apply the strategies and knowledge you have built. It is an opportunity to consolidate your learning and identify any remaining areas for improvement before test day.

Final Assessment: GRE Quant Strategy

Covers: Final Assessment: GRE Quant Strategy (quiz, 5 min)

The "Final Assessment: GRE Quant Strategy" quiz is more than just a test of your knowledge. It is a strategic exercise. This assessment brings together all the arithmetic, algebra, geometry, and data interpretation skills you have developed. It also challenges your ability to apply GRE-specific strategies, such as handling Quantitative Comparison questions and knowing when to estimate versus calculate.

What You Should Have Mastered

By this point, you should feel confident in your understanding of the core GRE Quant topics. You should be able to:

- Accurately solve problems across all content areas.
- Apply the reliable framework for Quantitative Comparison questions.
- Interpret data displays quickly and accurately.
- Make informed decisions about when to calculate precisely, estimate, or test numbers.
- Manage your time effectively under timed conditions.
- Recognize common GRE question patterns and traps.

How to Attack the Final Assessment

Approach this quiz as if it were the actual GRE. Find a quiet place where you will not be disturbed. Set a timer for the recommended duration.

1. **Read Carefully:** Pay close attention to every word in the question and answer choices. Misreading is a common source of error.
2. **Use Scratch Paper:** Mimic test conditions by using scratch paper for all calculations. Do not try to do complex math in your head.
3. **Pacing:** Keep an eye on the clock. If a question is taking too long, make an educated guess and move on. You can flag it for review if time permits.

4. **Quantitative Comparison Strategy:** Remember your framework: simplify both quantities, test numbers if algebraic simplification is not clear, and be wary of special numbers (zero, one, negative numbers, fractions).
5. **Data Interpretation:** Quickly grasp the labels, units, and scales of graphs and tables before attempting questions. Focus on extracting the specific data points needed for each question.
6. **Review:** If you finish early, review flagged questions first. Then, quickly check your other answers for obvious errors.

Common Mistakes to Avoid

- **Careless Errors:** These include arithmetic mistakes, copying numbers incorrectly, or misinterpreting a word in the problem. Double-check your work, especially on questions you feel confident about.
- **Getting Stuck:** Spending too much time on a single difficult question is detrimental to your overall score. The GRE does not penalize incorrect answers more than unanswered questions. Make your best guess and move on.
- **Not Using Strategies:** Failing to apply the specific strategies learned for Quantitative Comparison or data interpretation can lead to inefficiency and errors.
- **Ignoring Units:** Always pay attention to the units given in the problem and required in the answer. Unit conversions are a frequent trap.
- **Over-calculating:** Not knowing when to estimate or use number properties instead of brute-force calculation wastes precious time.

How to Interpret Your Results

Your score on this final assessment is a strong indicator of your readiness. However, the raw score is only part of the story.

1. **Error Analysis:** For every question you answered incorrectly, determine *why* you got it wrong. Was it a content gap? A careless error? A misapplication of strategy? A timing issue? Categorize your mistakes.
2. **Content Gaps:** If you consistently miss questions from a specific topic (e.g., probability, geometry), revisit those lessons and practice more problems in that area.
3. **Strategy Issues:** If you struggled with Quantitative Comparison or data interpretation, review the specific strategies for those question types.
4. **Pacing Problems:** If you ran out of time, practice setting stricter time limits for individual problems or question sets.
5. **Review Correct Answers:** Even for questions you got right, consider if you used the most efficient method. There might be a quicker way to solve it.

Use this assessment as a diagnostic tool. It highlights your strengths and pinpoints exactly where you need further practice. This targeted approach is the most effective way to improve your GRE Quant score.

KEY TAKEAWAYS

- The Final Assessment evaluates your comprehensive mastery of GRE Quant concepts and strategies.
- Approach the assessment under realistic test conditions to simulate the actual GRE experience.
- Careful reading, effective pacing, and consistent use of scratch paper are crucial for success.
- Avoid common pitfalls such as careless errors, getting stuck, and ignoring specific test strategies.
- Perform a thorough error analysis on your results to identify specific content gaps or strategic weaknesses.
- Use your assessment performance to guide your final study efforts, focusing on areas needing improvement.

CHECK YOUR UNDERSTANDING

Answer these before moving on. Model answers are in the Answer Key at the back of this guide.

1. What is the primary purpose of taking the "Final Assessment: GRE Quant Strategy" quiz?
2. Name three specific strategies a student should employ while taking the final assessment.
3. What are some common mistakes students make during a timed quantitative assessment?
4. How should a student interpret a low score on the final assessment?
5. Why is error analysis more important than just knowing your raw score?

REFERENCE

Glossary

Absolute value

The distance of a number from zero on the number line, always resulting in a non-negative value.

Careless slip

A type of practice error where the student knows the concept and method but makes a simple mistake (e.g., calculation error, misreading) during execution.

Combination

A selection of items where the order of selection is not important.

Content gap

A type of practice error indicating a lack of fundamental understanding of a mathematical concept, preventing a solution even with unlimited time.

Coordinate geometry

The study of geometric figures using a coordinate system, typically the Cartesian plane with x and y axes.

Data interpretation

A cluster of GRE questions that require analyzing and drawing conclusions from charts, graphs, or tables.

Error analysis

The process of reviewing incorrect answers to understand the underlying causes of mistakes, such as content gaps or strategic failures.

Exponent

A number indicating how many times a base number is multiplied by itself.

Factor

A number that divides another number evenly, leaving no remainder.

Function

A relation where each input has exactly one output.

Greatest common divisor (gcd)

The largest positive integer that divides two or more integers without a remainder.

Inequality

A mathematical statement comparing two expressions using symbols like $<$, $>$, $\leq$, or $\geq$, indicating they are not necessarily equal.

Integer

A whole number, positive, negative, or zero.

Least common multiple (lcm)

The smallest positive integer that is a multiple of two or more integers.

Mean

The arithmetic average of a set of numbers.

Median

The middle value in an ordered set of numbers.

Method miss

A type of practice error where the correct answer could be found, but an inefficient or overly complex strategy was used, leading to wasted time.

Mode

The value that appears most frequently in a data set.

Multiple

A number that can be divided by another number without a remainder.

Order of operations

The sequence of steps for evaluating mathematical expressions, typically remembered by PEMDAS (Parentheses, Exponents, Multiplication, Division, Addition, Subtraction).

Pacing

The management of time spent on individual questions or sections of an exam to ensure all questions are attempted within the allotted time.

Percent

A ratio indicating parts per hundred, modeled by the equation: $\text{part} = \text{percent} \times \text{whole}$.

Percent change

The relative change between a new value and an old value, calculated as $(\text{new} - \text{old}) / \text{old}$, with the original value always in the denominator.

Percentile

A measure indicating the value below which a given percentage of observations in a group of observations fall.

Permutation

An arrangement of items where the order of selection is important.

Prime number

A natural number greater than 1 that has no positive divisors other than 1 and itself.

Probability

The likelihood of an event occurring, expressed as a ratio of favorable outcomes to total possible outcomes.

Pythagorean theorem

In a right triangle, the square of the hypotenuse (c) is equal to the sum of the squares of the other two sides (a and b), expressed as $a^2 + b^2 = c^2$.

Quantitative comparison

A GRE question type requiring comparison of two quantities, A and B, to determine their relationship.

Quantitative comparison (qc)

A GRE question type where you compare two quantities and determine their relationship ($A > B$, $B > A$, $A = B$, or relationship cannot be determined).

Range

The difference between the highest and lowest values in a data set.

Ratio

A comparison of two or more quantities, often expressed as $a:b$, which can be represented as multiples like 'ax' and 'bx' for problem-solving.

Test strategy

A systematic approach to managing time, selecting appropriate methods, and navigating question types during an exam.

REFERENCE

Answer Key

Chapter 1: Section 1: Foundations of GRE Quantitative Reasoning

1. What are the four main question types found in the GRE Quantitative Reasoning section?

The four main question types are Problem Solving, Quantitative Comparison, Numeric Entry, and Data Interpretation. Each type assesses different aspects of quantitative reasoning and requires specific approaches.

2. When solving an inequality, under what specific condition must you reverse the direction of the inequality sign?

You must reverse the direction of the inequality sign when you multiply or divide both sides of the inequality by a negative number. Failing to do so will result in an incorrect solution set.

3. Describe the primary strategy of 'number picking' in Quantitative Comparison questions.

Number picking involves substituting various types of numbers (positive, negative, zero, fractions) for variables in both quantities. If different numbers lead to different relationships between Quantity A and Quantity B, the answer is (D). If the relationship consistently holds, you can choose A, B, or C.

4. What is the relationship between the slopes of two perpendicular lines in coordinate geometry?

The slopes of two perpendicular lines are negative reciprocals of each other. If one line has a slope of m , a line perpendicular to it will have a slope of $-1/m$.

5. Explain the meaning of a negative exponent, such as b^{-n} .

A negative exponent b^{-n} indicates the reciprocal of the base raised to the positive exponent. It means $1 / b^n$. For example, 5^{-2} is $1 / 5^2$, which equals $1/25$.

Chapter 2: Data Analysis and Advanced Problem Solving

1. A bar graph shows the number of students enrolled in four different courses: Math (120), Science (90), English (150), History (60). What percentage of the total student enrollment is in the Science course?

First, find the total enrollment: $120 + 90 + 150 + 60 = 420$ students. The number of students in Science is 90. The percentage is $(90 / 420) * 100\%$. This simplifies to approximately 21.43%.

2. A set of numbers is {10, 15, 5, 20, 15}. Find the mean, median, and mode for this set.

To find the mean, sum the numbers ($10+15+5+20+15 = 65$) and divide by the count (5): $65/5 = 13$. To find the median, order the set: {5, 10, 15, 15, 20}. The middle value is 15. The mode is the most frequent number, which is 15.

3. **A shirt originally priced at \$40 is discounted by 25%. Then, an additional 10% discount is applied to the sale price. What is the final price of the shirt?**

First, calculate the 25% discount: $\$40 * 0.25 = \10 . The price after the first discount is $\$40 - \$10 = \$30$. Then, apply the 10% discount to \$30: $\$30 * 0.10 = \3 . The final price is $\$30 - \$3 = \$27$.

4. **How many different 3-digit numbers can be formed using the digits 1, 2, 3, 4, 5 if no digit can be repeated?**

This is a permutation problem because the order of the digits matters (e.g., 123 is different from 321). For the first digit, there are 5 choices. For the second, 4 choices remain. For the third, 3 choices remain. The total number of different 3-digit numbers is $5 * 4 * 3 = 60$.

5. **If a function is defined as $f(x) = x^2 - 3x + 1$, what is the value of $f(-2)$?**

To find $f(-2)$, substitute -2 for x in the function's definition. $f(-2) = (-2)^2 - 3(-2) + 1$. This simplifies to $4 - (-6) + 1$, which is $4 + 6 + 1 = 11$.

Chapter 3: Quantitative Reasoning: Number Properties, Counting, and Probability

1. **How do you determine if a large number is divisible by 3 and 9?**

A number is divisible by 3 if the sum of its digits is divisible by 3. Similarly, a number is divisible by 9 if the sum of its digits is divisible by 9. For example, for the number 123, the sum of digits is $1+2+3=6$, which is divisible by 3 but not 9. So 123 is divisible by 3 but not 9.

2. **Explain the difference between a permutation and a combination. Provide an example for each.**

A permutation is an arrangement of items where the order of selection matters. An example is arranging 3 specific books on a shelf from a collection of 10 books. A combination is a selection of items where the order of selection does not matter. An example is choosing a committee of 3 people from a group of 10 people.

3. **What is the formula for calculating the number of elements in the union of two sets, A and B, when some elements overlap?**

The formula for the number of elements in the union of two sets A and B, denoted as $A \cup B$, is $|A \cup B| = |A| + |B| - |A \cap B|$. Here, $|A|$ is the number of elements in set A, $|B|$ is the number of elements in set B, and $|A \cap B|$ is the number of elements common to both sets (the overlap).

4. **If the probability of event A is 0.6, what is the probability that event A does not occur?**

The probability that event A does not occur is found using complementary probability. It is calculated as 1 minus the probability of event A occurring. So, $P(\text{not } A) = 1 - P(A) = 1 - 0.6 = 0.4$.

5. **Find the GCD and LCM of 24 and 36.**

First, find the prime factorization of each number: $24 = 2^3 * 3^1$ and $36 = 2^2 * 3^2$. The GCD is found by taking the lowest power of common prime factors: $2^2 * 3^1 = 4 * 3 = 12$. The LCM is found by taking the highest power of all prime factors present: $2^3 * 3^2 = 8 * 9 = 72$.

Chapter 4: Quant Toolkit

1. Describe the core strategy for Quantitative Comparison questions.

The core strategy for Quantitative Comparison questions is to determine if the relationship between Quantity A and Quantity B is *forced*. If variables are involved, test adversarial numbers (positive, negative, zero, fractions) to see if the relationship can change. You can also simplify both quantities by performing the same operations (addition, subtraction, or multiplication/division by known positive values).

2. Explain the 'part = percent x whole' mental model and provide an example.

This model states that the part is equal to the percentage (expressed as a decimal) multiplied by the whole amount. For example, to find 30% of 90, you would calculate 0.30 multiplied by 90, which equals 27. Here, 27 is the part, 0.30 is the percent, and 90 is the whole.

3. Why does a 20% increase followed by a 20% decrease not return to the original value?

This does not return to the original value because the base for the second percentage change is different. A 20% increase is applied to the original value, but the subsequent 20% decrease is applied to the *increased* value. For instance, starting with 100, a 20% increase yields 120. A 20% decrease on 120 is 24, resulting in $120 - 24 = 96$, which is less than the original 100.

4. What are the three categories for classifying practice errors, and why is this classification important?

The three categories are Content Gap, Method Miss, and Careless Slip. This classification is important because each type of error requires a different corrective action. Identifying the dominant error type allows students to focus their study efforts more effectively, addressing the root cause of their mistakes rather than just repeating problems.

5. What is the recommended average time per question for GRE Quant, and where should students plan to spend banked time?

Students should aim for an average of 1 minute 45 seconds per question, with a personal cap of three minutes on any single question. Time banked from quicker questions, especially Quantitative Comparison, should be allocated to the Data Interpretation cluster, which often appears later in each section and may require more time for analysis.

Chapter 5: Final Assessment: GRE Quant Strategy

1. What is the primary purpose of taking the "Final Assessment: GRE Quant Strategy" quiz?

The primary purpose is to evaluate a student's comprehensive mastery of all GRE Quant concepts and strategies covered in the bootcamp. It also provides a realistic simulation of the GRE Quant section, allowing students to apply their knowledge under timed conditions.

2. Name three specific strategies a student should employ while taking the final assessment.

Students should read questions carefully, use scratch paper for all calculations, and manage their

pacing to avoid getting stuck on difficult problems. They should also apply specific strategies for Quantitative Comparison and Data Interpretation questions.

3. What are some common mistakes students make during a timed quantitative assessment?

Common mistakes include making careless arithmetic errors, spending too much time on a single difficult question, failing to apply learned strategies, ignoring units in problems, and over-calculating when estimation or number properties would be faster.

4. How should a student interpret a low score on the final assessment?

A low score should be interpreted as a diagnostic tool, not just a final judgment. The student should perform a thorough error analysis to identify specific content gaps, strategic weaknesses, or pacing issues. This analysis helps guide targeted practice and review.

5. Why is error analysis more important than just knowing your raw score?

Error analysis provides actionable insights beyond a simple score. It helps pinpoint the types of mistakes made (e.g., content, careless, strategy, timing). Understanding the root cause of errors allows for focused study and improvement, which is more effective than simply re-doing problems.

CLOSING

Where to Go Next

Completing the GRE Quant Bootcamp is a significant step in your test preparation. To solidify your skills, continue practicing with official GRE materials and full-length practice tests. Focus on applying the strategies and frameworks you have learned to new problem sets.

Identify any remaining areas of weakness and dedicate extra practice to those topics. Consider reviewing specific lessons in this course that address those areas. Consistent, timed practice under test conditions will help you manage pacing and build stamina.

After mastering the quantitative section, you may wish to explore additional GRE preparation resources for the verbal reasoning and analytical writing sections. This comprehensive approach will ensure you are fully prepared for all aspects of the GRE General Test.



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