



The People Who Make the Test!

Volume 1

Official GRE[®] 数学 官方指南

QUANTITATIVE REASONING
Practice Questions

150 *real* test questions with explanations
— straight from the maker of the GRE[®] revised General Test

 群言出版社
Qunyan Press



Volume 1

Official GRE[®] 数学 官方指南

QUANTITATIVE REASONING
Practice Questions

图书在版编目(CIP)数据

GRE数学官方指南 / 美国教育考试服务中心著. —
北京 : 群言出版社, 2014.7
书名原文: Official GRE quantitative reasoning
practice questions
ISBN 978-7-80256-600-2

I. ①G… II. ①美… III. ①GRE—高等数学—自学参
考资料 IV. ①O13

中国版本图书馆CIP数据核字(2014)第171988号

版权登记: 京版出图字01—2014—5514

Educational Testing Service
Official GRE® Quantitative Reasoning Practice Questions
ISBN 978-0-07-183432-2
Copyright © 2014 by Educational Testing Service.

All Rights reserved. No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including without limitation photocopying, recording, taping, or any database, information or retrieval system, without the prior written permission of the publisher.

This authorized Bilingual edition is jointly published by McGraw-Hill Education (Asia) and Qunyan Press. This edition is authorized for sale in the People's Republic of China only, excluding Hong Kong, Macao SAR and Taiwan.

Copyright © 2014 by The McGraw-Hill Education (Singapore) Pte. Ltd. and Qunyan Press.

版权所有。未经出版人事先书面许可, 对本出版物的任何部分不得以任何方式或途径复制或传播, 包括但不限于复印、录制、录音, 或通过任何数据库、信息或可检索的系统。

本授权双语版由麦格劳-希尔(亚洲)教育出版公司和群言出版社合作出版。此版本经授权仅限在中华人民共和国境内(不包括香港特别行政区、澳门特别行政区和台湾)销售。

版权 © 2014由麦格劳-希尔(亚洲)教育出版公司与群言出版社所有。

本书封面贴有McGraw-Hill Education公司防伪标签, 无标签者不得销售。

北京市版权局著作权合同登记号: 01-2014-5514

Copyright © 2014 by Educational Testing Service. All rights reserved.

ETS, the ETS logo, LISTENING, LEARNING, LEADING, E-RATER, GRADUATE RECORD EXAMINATIONS, GRE, POWERPREP, SCORESELECT, TOEFL, and TOEIC are registered trademarks of Educational Testing Service in the United States and other countries and are used under license. THE PRAXIS SERIES is a trademark of Educational Testing Service and is used under license.

责任编辑 孙冠群

封面设计 大愚设计+赵 娣

出版发行 群言出版社(Qunyan Press)

地 址 北京市东城区东厂胡同北巷1号(100006)

网 站 www.qypublish.com

电子信箱 bj62605588@163.com qunyanpbs@126.com

总 编 办 010-62605588 65265404 65138815

发 行 部 010-62605019 62263345 65220236

经 销 全国新华书店

读者服务 010-62418641 65265404 65263345

法律顾问 北京市君泰律师事务所

印 刷 北京慧美印刷有限公司

版 次 2014年9月第1版 2014年9月第1次印刷

开 本 889×1194 1/16

印 张 22

字 数 315千字

书 号 ISBN 978-7-80256-600-2

定 价 68.00元

☞ [版权所有, 侵权必究]

如有缺页、倒页、脱页等印装质量问题, 请拨打服务热线: 010-62605166。



Welcome to

Official GRE® Quantitative Reasoning Practice Questions, Volume 1

The book you are holding offers 150 real GRE practice questions directly from the maker of the GRE® revised General Test. This book is specially created to give you in-depth practice and accurate test preparation for the Quantitative Reasoning measure.

Here's what you will find inside:

- **Authentic GRE Quantitative Reasoning test questions** arranged by content and question type—to help you build your test-taking skills. Plus, mixed practice sets.
- **Answers and explanations** for every question!
- **ETS's own test-taking strategies.** Learn valuable hints and tips that can help you get your best score.
- **GRE Math Review** covering math topics you need to know for the test.
- **Official information on the GRE Quantitative Reasoning measure.** Get the facts about the test content, structure, scoring, and more—straight from ETS.

About ETS

At ETS, we advance quality and equity in education for people worldwide by creating assessments based on rigorous research. ETS serves individuals, educational institutions, and government agencies by providing customized solutions for teacher certification, English language learning, and elementary, secondary, and post-secondary education, as well as conducting educational research, analysis, and policy studies. Founded as a nonprofit in 1947, ETS develops, administers, and scores more than 50 million tests annually—including the TOEFL® and TOEIC® tests, the GRE® tests, and *The Praxis Series*™ assessments—in more than 180 countries at over 9,000 locations worldwide. For more information, visit www.ets.org.

IMPORTANT

ETS makes available free test preparation materials for individuals planning to take a GRE test. POWERPREP® II software is available for individuals planning to take the computer-delivered GRE revised General Test, and the *Practice Book for the Paper-based GRE revised General Test*,

Second edition, is available for individuals planning to take the paper-delivered test. The information about how to prepare for the Quantitative Reasoning measure of the GRE revised General Test, including test-taking strategies, question strategies, etc., that is included in the free test preparation is also included in this publication. This publication also provides you with 150 brand new practice questions with answers and explanations.

For more information about the GRE revised General Test, free and low-cost GRE test preparation materials, and other GRE products and services, please visit the GRE website at:

www.ets.org/gre



Inquiries concerning the practice test questions in this book should be sent to the GRE testing program at:

GRETestQuestionInquiries@ets.org

How to Use This Book

This book provides important information about the Quantitative Reasoning measure of the GRE revised General Test, including the knowledge and skills that are assessed and the types of questions that appear. The book will help you:

- Familiarize yourself with the test format and test question types
- Learn valuable test-taking strategies for each question type
- Review the math topics you need to know for the test
- Check your progress with Quantitative Reasoning practice questions

The following four-step program has been designed to help you make the best use of this book.

STEP 1 Learn About the GRE Quantitative Reasoning Measure

Chapter 1 of this book provides an overview of the GRE Quantitative Reasoning measure. Read this chapter to learn about the number of questions, time limits, and the test design features. You will also find valuable test-taking strategies from ETS and important information about how the measure is scored.

STEP 2 Study the Different GRE Quantitative Reasoning Question Types

Chapter 2 of this book describes the types of questions you will encounter in the Quantitative Reasoning measure. You will learn what the questions are designed to measure, and you will get tips for answering each question type. You will also see samples of each question type, with helpful explanations.

STEP 3 Practice Answering GRE Quantitative Reasoning Questions

Chapters 3, 4, 5, and 6 contain sets of authentic Quantitative Reasoning practice questions in the content areas of Arithmetic, Algebra, Geometry, and Data Analysis, respectively. Answer the questions in each set, and then read through the explanations to see which questions you found most challenging. Look for patterns. Did specific content areas give you trouble? You can refresh your math skills in these areas with the GRE Math Review in Appendix A. The GRE Math Review is a review of the math topics that are likely to appear on the Quantitative Reasoning measure. Each section of the GRE Math Review ends with exercises that will help you see how well you have mastered the material. Note that Appendix B provides information about the mathematical conventions that are used on the Quantitative Reasoning measure. Prior to answering the practice questions, it might be helpful to review these conventions.

STEP 4 Test Yourself With the Mixed Practice Sets

Once you have completed the practice sets for each content area in Chapters 3–6, it is time to practice with authentic GRE questions in the Mixed Practice Sets in Chapter 7. Each Mixed Practice Set includes the question types and content areas contained in an actual Quantitative Reasoning section of the GRE revised General Test.

Contents

How to Use This Bookxi

1

Overview of the GRE® Quantitative Reasoning Measure 1

Introduction to the GRE® revised General Test	1
The Quantitative Reasoning Measure of the Computer-delivered GRE revised General Test	2
The Quantitative Reasoning Measure of the Paper-delivered GRE revised General Test	4
Score Reporting	5

2

Test Content 7

Overview of the Quantitative Reasoning Measure	7
General Problem-solving Steps	9
Quantitative Reasoning Question Types	14
Using the Calculator	39

3

Arithmetic 43

Quantitative Comparison Questions	45
Multiple-choice Questions—Select One Answer Choice	47
Multiple-choice Questions—Select One or More Answer Choices	49
Numeric Entry Questions	50
Answer Key	51
Answers and Explanations	52

4 Algebra 65

Quantitative Comparison Questions	67
Multiple-choice Questions—Select One Answer Choice	69
Multiple-choice Questions—Select One or More Answer Choices	71
Numeric Entry Questions	72
Answer Key	73
Answers and Explanations	74

5 Geometry 85

Quantitative Comparison Questions	87
Multiple-choice Questions—Select One Answer Choice	89
Multiple-choice Questions—Select One or More Answer Choices	91
Numeric Entry Questions	92
Answer Key	93
Answers and Explanations	94

6 Data Analysis 105

Quantitative Comparison Questions	107
Multiple-choice Questions—Select One Answer Choice	110
Multiple-choice Questions—Select One or More Answer Choices	112
Numeric Entry Questions	113
Data Interpretation Sets	114
Answer Key	118
Answers and Explanations	119

7

Mixed Practice Sets

139

Practice Set 1	141
Answer Key	151
Answers and Explanations	152
Practice Set 2	173
Answer Key	183
Answers and Explanations	184
Practice Set 3	199
Answer Key	209
Answers and Explanations	210

Appendix A: GRE® Math Review

229

1. Arithmetic	230
2. Algebra	245
3. Geometry	273
4. Data Analysis	288

Appendix B: Mathematical Conventions for the Quantitative Reasoning Measure of the GRE® revised General Test

329

1

Overview of the GRE[®] Quantitative Reasoning Measure

**Your goal for
this chapter**

⇒ Review basic information on the structure of the GRE[®] Quantitative Reasoning measure, test-taking strategies, and scoring

Introduction to the GRE[®] revised General Test

改革后的GRE普通考试（以下简称“GRE考试”）——全球最广为接受的研究生入学标准考试——旨在测试学生在研究生院和商学院取得成功所必备的文字推理（Verbal Reasoning）、数量推理（Quantitative Reasoning）和分析性写作（Analytical Writing）这三项技能。

研究生院和商学院的申请者都会参加GRE考试。针对来自不同教育背景和文化背景的申请者，GRE考试提供了一个普遍适用的衡量标准。高校入学委员会和奖学金评定组将GRE分数和本科成绩单、推荐信以及其他进入硕士阶段学习的资格证明综合在一起对候选人作出评定。

GRE考试在全球160多个国家拥有考点。目前在大多数地区，全年都可以进行机考。在无法实现机考的地区，GRE考试采用纸笔考试的形式进行，每年有三场考试。

在参加GRE考试前，考生有必要熟悉考试内容和结构，以及Verbal Reasoning、Quantitative Reasoning和Analytical Writing各部分考查的具体内容和结构。本书系统介绍了GRE Quantitative Reasoning测试和备考策略。第一章整体介绍了Quantitative Reasoning测试的结构及评分标准。第二章到第七章详细介绍了Quantitative Reasoning测试的具体内容。通过使用本书，考生可全面了解Quantitative Reasoning测试的内容和相关信息。欲了解有关GRE考试的最新信息，请访问GRE官方网站 www.ets.org/gre。

The Quantitative Reasoning Measure of the Computer-delivered GRE revised General Test

Structure of the Quantitative Reasoning Measure

<i>Measure</i>	<i>Number of Questions</i>	<i>Allotted Time</i>
Quantitative Reasoning (Two sections)	20 questions per section	35 minutes per section

Quantitative Reasoning测试可能以任何顺序出现在第一部分结束后的考试中。Quantitative Reasoning测试的每个部分前面的考试说明会明确指出该部分的题目数量和答题时间。

Test Design Features

在基于计算机的GRE考试中，Quantitative Reasoning测试采用基于“部分”水平（section-level）的自适应考试。计算机将根据考生在第一部分测试的答题表现来选择第二部分的测试。

此外，GRE机考先进的设计提供的功能，让考生能够在每个测试部分中自由地前后翻页。其设计特点包括：

- 每个测试部分内部增设预览和回顾功能；
- “标记”和“检查”功能让考生可以标记一些题目，在本部分所给时间有所剩余的情况下，考生可回顾检查这些题目；
- 允许考生在每个测试部分内修改已做出的答案；
- 提供屏幕计算器功能（关于计算器的详细说明见第二章）。

Test-taking Strategies

Quantitative Reasoning测试包含多种题型。有些题型需要考生选择一个答案，有些则需要考生选择一个或多个答案，还有些需要考生输入一个数值。因此，考生在回答问题时，要确保答案符合题目要求。在Quantitative Reasoning部分，考试中心会向考生提供屏幕计算器。

参加GRE计算机考试时，在Quantitative Reasoning测试部分，考生可以跳过那些做起来可能有困难的题目。考试软件有“标记”功能，考生可以标记一些题目，以便在本部分所给时间内返回到这些题目。考试软件还有“检查”功能，可以让考生查看本部分所有问题的列表，以确认是否解答了所有问题，并能看到做了标记的问题。在本部分时间有剩余的情况下，考生还可以检查已经解答过的问题并修改答案。

下图显示的是检查页面。这个检查页面旨在帮助考生了解考试进度。不要花太多的时间在检查页面，因为这会浪费读题和解题的时间。

GRE® General Test Section 4 of 6

ETS INFO EXIT NEXT

Question 16 of 20

Return Go To Question

Hide Time 00 : 27 : 55

Below is the list of questions in the current section. The question you were on is highlighted. Questions you have seen are labeled **Answered**, **Incomplete**, or **Not Answered**. A question is labeled **Incomplete** if the question requires you to select a certain number of answer choices and you have selected more or fewer than that number. Questions you have marked are indicated with a ✓.

To return to the question you were on, click **Return**.

To go to a different question, click on that question to highlight it, then click **Go To Question**.

Question Number	Status	Marked
1	Answered	
2	Answered	
3	Answered	
4	Answered	
5	Answered	
6	Incomplete	
7	Answered	✓
8	Answered	
9	Answered	
10	Answered	

Question Number	Status	Marked
11	Answered	
12	Incomplete	
13	Incomplete	
14	Incomplete	✓
15	Incomplete	✓
16	Answered	
17	Answered	
18	Answered	✓
19	Not seen	
20	Not seen	

考生的Quantitative Reasoning成绩取决于考生答对的题目数量。答错题并不扣分。因此，为了在Quantitative Reasoning测试部分尽可能多得分，考生最好把所有题目都答完。

在细心的前提下尽可能快地做题。由于所有问题的权重都是一样的，因此不要花太多时间去思考那些非常难或者不熟悉的题目。

在Quantitative Reasoning部分，考生可以先迅速地浏览所有题目，期间只停下来回答有把握的问题，然后有时间的话再回过头来看那些需要进一步思考的、解决起来有困难的问题。

在正式的GRE考试过程中，每部分都只能在规定时间内做一次，一旦完成就不能再返回查看。

Scratch Paper

考生将在考试开始时拿到一份草稿纸。在考试过程中如果需要，也可向监考人员索要更多草稿纸。

How the Quantitative Reasoning Measure Is Scored

Quantitative Reasoning测试是采用基于“部分”水平的自适应考试。计算机将根据考生在第一部分测试的答题表现来选择第二部分的测试题。在每部分中，每个问题对于最终成绩的意义是等同的。首先会计算原始分。原始分就是考生答对问题的数量。原始分将通过一个被称之为均衡化的过程转换为标准分。均衡化的过程要考虑不同考试间考题难度的细微差异，以及由于计算机自适应所产生的两部分题目之间的差异。因此，无论第二部分测试什么内容、无论考生参加哪次考试，对一个测试部分给定的标准分反映的是相同的应试水平。

The Quantitative Reasoning Measure of the Paper-delivered GRE revised General Test

Structure of the Quantitative Reasoning Measure

<i>Measure</i>	<i>Number of Questions</i>	<i>Allotted Time</i>
Quantitative Reasoning (Two sections)	25 questions per section	40 minutes per section

Quantitative Reasoning部分可能以任何顺序出现在第二部分结束后的考试中。每部分前面的考试说明会给出该部分的题目数量和考试时长。

Test Design Features

- 考生能够在每个测试部分中自由地跳过和回到某个题目，或者修改已做出的答案；
- 答案直接填写在试题册上，而不是写在单独的答题卡上；
- 在Quantitative Reasoning部分，会为考生提供计算器；考生不能使用自带的计算器。

Test-taking Strategies

Quantitative Reasoning测试由多种题型构成。有些题型需要考生选择一个答案，有些题型需要考生选择一个或多个答案，还有些需要考生输入一个数值。因此，考生要确保答案符合题目要求。在Quantitative Reasoning部分，考试中心会给考生提供一个计算器。

在作答Quantitative Reasoning部分时，考生可以跳过那些觉得可能有困难的题目，并在本部分所给时间内重新回到这些题目。在时间允许的情况下，考生也可以修改该测试部分中任何一道问题的答案（涂去旧答案，填上新答案）。注意不要在答题区留下任何不必要的痕迹，否则有可能被判断为错误答案。但考生可以利用试题册的其他空白区域放心地做笔记或演算题目。不提供额外的草稿纸。

考生的Quantitative Reasoning成绩取决于考生答对题目的数量。答错题并不扣分。因此，为了在Quantitative Reasoning部分尽可能多得分，考生最好把所有题目都答完。

在细心的前提下尽可能快地做题。由于所有问题的权重都是一样的，不要花太多时间去考虑那些觉得有困难或者不熟悉的题目。

在Quantitative Reasoning部分，如果有时间的话考生可以先迅速地浏览所有题目，期间只停下来回答有把握的问题，然后再回过头来看那些需要进一步思考的、解决起来有困难的问题。

在实际的考试流程中，考生只能在规定的时间内回答指定部分的题目，当监考人员宣布“停止答题”后，考生不可以再回查已经答过的部分。如果考生这样做了，监考人员有权将其逐出考场。

所有的答案都应该写在试题册上。

How the Quantitative Reasoning Measure Is Scored

Quantitative Reasoning测试部分的打分包含两个步骤。首先，计算出每项测试的原始分。每项测试的原始分都是考生在该项测试两部分题目中答对题目的总数。然后，原始分将通过一个被称之为均衡化的过程转换为标准分。均衡化的过程要考虑不同考试间考题难度的细微差异。因此，无论考生参加哪次考试，对一个测试部分给定的标准分反映的是相同的应试水平。

Score Reporting

Quantitative Reasoning的成绩按照130~170的评分区间给出，最小分数段为1分。如果考生在测试中没有回答任何问题，则该项测试会收到没有成绩（No Score, NS）的通知。

The ScoreSelect® Option

ScoreSelect®既适用于GRE普通考试，也适用于GRE专项考试，并且任何具有最近五年内有效的GRE考试成绩的考生均可使用。通过该服务，考生可以选择自己满意的成绩寄送给要申请的院校。对于四份免费的成绩报送，考生可以选择寄送最近一次的考试成绩，也可以选择寄送五年内所有的GRE考试成绩。考试过后，考生如果要寄送额外的成绩单，可以通过付费服

务选择最近一次的、所有的或者任何一次的考试成绩。需要提醒的是，单次的GRE考试成绩必须给予完整报告。更多信息可访问www.ets.org/gre/scoresselect。

Score Reporting Time Frames

改革后的基于计算机的GRE考试将在考试日期后大约10~15天给出成绩；纸笔考试将在考试后6周内给出成绩。如果考生申请了研究生或商学院项目，需仔细阅读招生截止日期，并及时参加考试，以便成绩能按时递送到所申请院校。

更多关于成绩报告的信息，请访问：www.ets.org/gre/scores/get。

2 Test Content

Your goals for this chapter

- ⇒ Learn general problem-solving steps and strategies
- ⇒ Learn the four types of GRE® Quantitative Reasoning questions and get tips for answering each question type
- ⇒ Study sample Quantitative Reasoning questions with solutions
- ⇒ Learn how to use the on-screen calculator

Overview of the Quantitative Reasoning Measure

GRE考试的Quantitative Reasoning（数量推理）测试考查考生的：

- 基本的数学技能；
- 对基本数学概念的理解；
- 定量推理、建模以及利用定量法解决问题的能力。

测试中的一些问题以现实生活为背景提出，其他问题则为纯数学背景。事实上，很多问题都是“应用题”，也就是说，考生必须能够对这些题目正确地理解并建立相应的数学模型。测试包括对以下四个方面的技能、概念和能力的考查。

算术 (Arithmetic)，包括整数的属性和类型 (properties and types of integers)，例如可分性 (divisibility)、因式分解 (factorization)、质数 (prime numbers)、余数 (remainders) 和奇偶数 (odd and even integers)；算术运算 (arithmetic operations)、指数 (exponents) 和根式 (roots)；以及一些概念，如估算 (estimation)、百分比 (percent)、比率 (ratio)、比例 (rate)、绝对值 (absolute value)、数轴 (the number line)、十进制 (decimal representation) 和数列 (sequences of numbers)。

代数 (Algebra)，包括指数运算 (operations with exponents)；因式分解和代数式的化简 (factoring and simplifying algebraic expressions)；关系 (relations)、函数 (functions)、方程 (equation) 和不等式 (inequalities)；求解二次方程和不等式 (linear and quadratic equations and inequalities)；求解联立方程和不等式 (simultaneous equations and inequalities)；列方程解数学应用题 (setting up equations to solve word problems)；解析几何 (也称坐标几何, coordinate geometry)，包括函数的图像、方程、不等式以及截距和斜率 (graphs of functions, equations, and inequalities, intercepts, and slopes of lines)。