Introduction to Quantitative Reasoning of GRE

GRE 数学小白必看

张凡

新东方国际教育

zhangfan@xdf.cn

GRE 冲分班数学

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Presentation Overview

❶ Score Goal

❷ Test Format

Score Goal

A Quick Survey About YourIntended Graduate Major

What is Your Intended Graduate Major

不同专业，GRE 数学分数要求不同

1. Computer Science, Electronic Engineering, Data Science, Finance, Physics, Chemistry, Biology, Statistics, Applied Mathematics, Management Business Analytics, Psychology(PhD.), Economics and other Engineering, Science or PhD. programs

2. Linguistic, Psychology(Master), Education(Master), Architecture, Philosophy, Gender Studies, East Asian Studies, Marketing, and Business

3. Others: State your Graduate Major

The Score Goal For Your Intended Graduate Major

Test scores are now optional, but still, approximately 87% of the Fall 2021 entering class submitted GRE scores. —https://www.math.columbia.edu/mafn/admissions/admissions-statistics/

GRE Quantitative Score	2019	2020	2021
Mean	169.1	169.5	169.17
Median	160.0	160.7	161.9

表: The median and average GRE QR score for the entering class of 2019, 2020 and 2021 in Mathematics of Finance MA Program of Columbia University

Your Response	Score Goal	Comments
1	169-170	Your study is heavily dependent on Mathe
2	165-170	Your study is weakly dependent on Mathe

表: Suggested Quantitative Reasoning score goal

QR Scores below the lower bound may dent your application.

Test Format

Test Day Experience

图: GRE Home Test

大陆考场：9:30 封闭考场，10 点左右开始考试，13:40 左右结束
国外考场：上午场和下午场可选
家考（Recommended）：7 天/24h 可选，安检 30 分钟，自己设备，印度
考官

Computer-Adaptive Test

Unscored Section

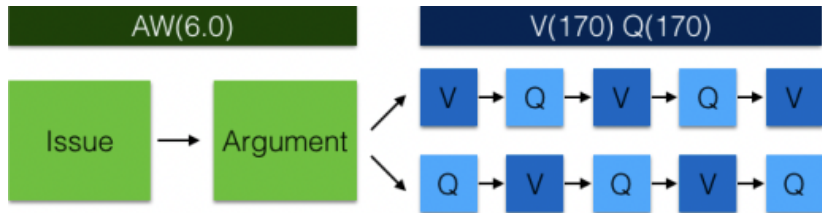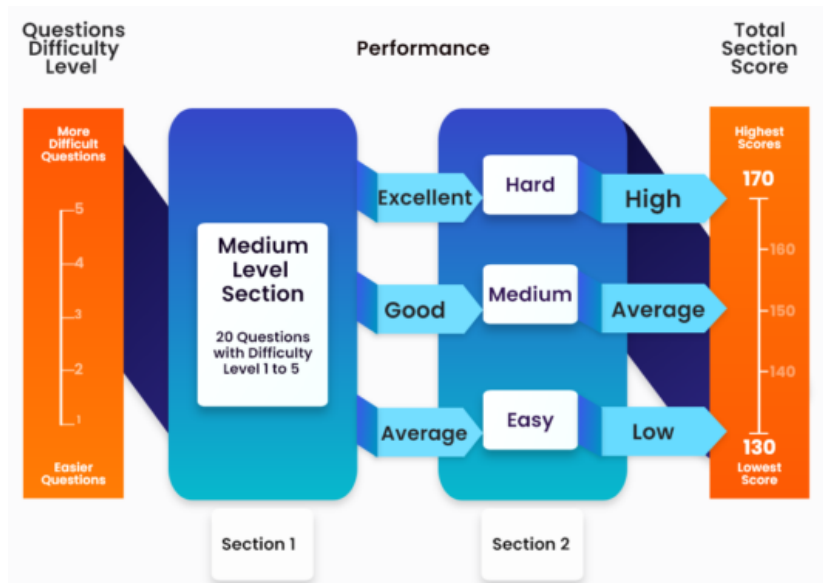第 1 个 section 往往是 routing section

可以预测加试科目，但是无法预测具体第 2 或者第 3 个 Section 是加试

图: Possible Routes

Computer-Adaptive Test: Section-Level Adaption

Scoring

Diagnostic Report 诊断报告

正常 15 天出分，出分后 3 天出诊断报告

First Section

Arithmetic

Reference #	Question Type	Setting	Right/Wrong	Difficulty Level	Time Spent
1	Quantitative Comparision	Pure math	Right	1	01:36
2	Multiple-choice—Select One or More	Real-life	Right	2	04:01
3	Quantitative Comparision	Pure math	Right	3	01:44
4	Multiple-choice—Select One	Pure math	Right	3	00:37

Algebra

Reference #	Question Type	Setting	Right/Wrong	Difficulty Level	Time Spent
1	Quantitative Comparision	Pure math	Right	2	00:58
2	Multiple-choice—Select One	Real-life	Right	3	01:00
3	Quantitative Comparision	Pure math	Right	3	01:22
4	Multiple-choice—Select One	Pure math	Right	4	03:09

Geometry

Reference #	Question Type	Setting	Right/Wrong	Difficulty Level	Time Spent
1	Quantitative Comparision	Pure math	Right	2	00:56
2	Quantitative Comparision	Pure math	Right	2	02:01
3	Numeric Entry	Pure math	Right	4	01:06
4	Numeric Entry	Real-life	Right	4	03:02

Diagnostic Report 诊断报告

Data Analysis 用时更多

Data Analysis

Reference #	Question Type	Setting	Right/Wrong	Difficulty Level	Time Spent
Discrete Questions					
1	Quantitative Comparision	Pure math	Right	2	01:10
2	Multiple-choice—Select One	Real-life	Right	3	02:02
3	Multiple-choice—Select One	Pure math	Right	3	01:09
4	Quantitative Comparision	Real-life	Right	3	01:17
5	Multiple-choice—Select One	Pure math	Right	4	00:48
Set Members					
6	Multiple-choice—Select One	Real-life	Right	2	02:02
7	Multiple-choice—Select One	Real-life	Right	4	02:18
8	Numeric Entry	Real-life	Right	5	02:33

Second Section

Arithmetic

Reference #	Question Type	Setting	Right/Wrong	Difficulty Level	Time Spent
1	Quantitative Comparision	Pure math	Right	3	01:35
2	Multiple-choice—Select One	Pure math	Right	4	00:31
3	Multiple-choice—Select One	Pure math	Right	4	01:42
4	Numeric Entry	Pure math	Right	5	01:55
5	Multiple-choice—Select One or More	Pure math	Wrong	5	05:11

Algebra

Reference #	Question Type	Setting	Right/Wrong	Difficulty Level	Time Spent
1	Multiple-choice—Select One	Real-life	Right	4	01:28
2	Quantitative Comparision	Pure math	Right	4	02:10
3	Quantitative Comparision	Pure math	Right	4	01:05
4	Quantitative Comparision	Pure math	Right	4	00:28

Geometry

Reference #	Question Type	Setting	Right/Wrong	Difficulty Level	Time Spent
1	Quantitative Comparision	Pure math	Right	3	02:21
2	Quantitative Comparision	Pure math	Right	4	00:39
3	Multiple-choice—Select One	Pure math	Right	4	00:55
4	Multiple-choice—Select One	Pure math	Right	4	01:48

Data Analysis

Reference #	Question Type	Setting	Right/Wrong	Difficulty Level	Time Spent
Discrete Questions					
1	Quantitative Comparision	Real-life	Right	2	00:38
2	Multiple-choice—Select One	Real-life	Right	4	01:42
3	Multiple-choice—Select One	Real-life	Right	4	02:56
4	Multiple-choice—Select One or More	Real-life	Wrong	5	01:53
Set Members					
5	Multiple-choice—Select One	Real-life	Right	1	01:13
6	Multiple-choice—Select One	Real-life	Right	4	02:32
7	Multiple-choice—Select One	Real-life	Right	5	02:09

Predict Your Score
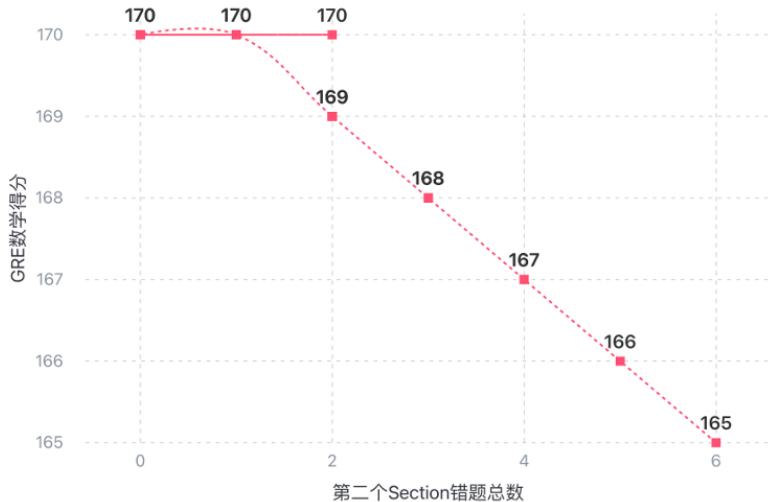
第二个 section 错题和分数的关系：错 1-2 个 170/169

图: Regression between the number of incorrect question of the 2nd section and

Question Types

Quantitative Comparison 比大小

选项固定，带入数，估算，化简

Quantity A   **Quantity B**

$13\frac{2}{13}$ $13\frac{3}{26}$

○ Quantity A is greater.

○ Quantity B is greater.

○ The two quantities are equal.

○ The relationship cannot be determined from the information given.

Select one answer choice.

Multiple-choice—Select One 单选

如果要近似，选项间隔小，一定要用计算器精确计算，最后一步再化简

Working alone at their respective constant rates, machine R processes one ton of ore in 4.5 hours, and machine S processes one ton of ore in 6.7 hours. Which of the following is closest to the number of hour that it would take both machines, working simultaneously at their respective constant rates, to process one ton of ore?

- ○ 2.4
- ○ 2.5
- ○ 2.6
- ○ 2.7
- ○ 2.8

Select one answer choice

Multiple-choice Questions—Select One or More Answer Choices 选一个或者多个，最后一题难度为 5

If $a > 1$, which of the following could be the value of $\left(1 + \frac{1}{a}\right)^{-1}$?

Indicate all such values.

☐ 0.35
☐ 0.42
☐ 0.57
☐ 0.75
☐ 0.98
☐ 1.06

Select one or more answer choice.

Numeric Entry Questions 数字填空题

注意单位；近似精度；Transfer Display；只能填一个整数或者分数

If $x = \sqrt{10}$, what is the value of $\left(5\sqrt{10} + x\right)^2$?

Enter your answer as an integer or a decimal in the answer box. Backspace to eras

Numeric Entry Questions 数字填空题

不用化简；分子分母分开填；

A bag contains a total of 12 bagels consisting of 5 plain bagels, 3 garlic bagels, and 4 cinnamon raisin bagels. If 2 bagels are to be selected at random from the bag without replacement, what is the probability that both bagels will be garlic bagels?

Give your answer as a fraction.

$$\frac{\boxed{}}{\boxed{}}$$

Enter your answer as a fraction, with the numerator and denominator in their respecti answer boxes. Backspace to erase.

Data Interpretation Sets 数据解读题套题
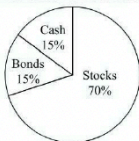
多道题目对应一组数据; 可单选, 不定项, 或者填空

Questions 14 to 16 are based on the following data.

Assets in Mutual Fund *X*, January 1, 2012

Distribution of Total Assets

Cash 15%
Bonds 15%
Stocks 70%

Total Assets: $15 billion
(1 billion = 10^9)

Distribution of Stock Assets in Fund *X*

Foreign Stocks	25%
Domestic Stocks:	
Technology	15%
Finance	10%
Utilities	18%
Retail	10%
Health Care	17%
Other	5%

Approximately what was the amount of assets in domestic utilities stocks in Fund *X*?

- ○ $0.12 billion
- ○ $0.19 billion
- ○ $1.2 billion
- ○ $1.9 billion
- ○ $11.5 billion

Select one answer

How to Use the On-screen Calculator

When to Use the Calculator

For tedious calculation only

图: Long Division

- Long division
- Square roots
- Addition, subtraction or multiplication of numbers that have several digits

Simple Calculations
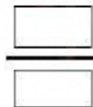
1. $10 - 490$
2. 4×70
3. $\frac{4300}{10}$
4. $\sqrt{25}$
5. 30^2

Fraction

Avoid using it to introduce decimals if you are asked to give an answer as a fraction.

图: Numeric Entry Question For a Fraction

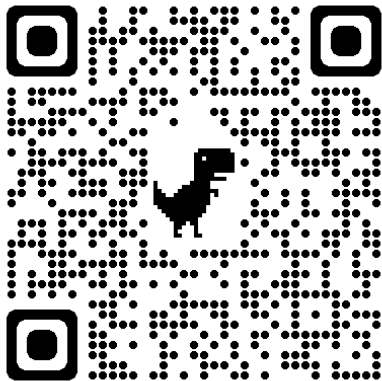https://tonypottera24.github.io/gre_calculator/web/

图: GRE Calculator Website

Demo: Order of Operations 运算优先级

From the Most Prioritized to Least Prioritized

1. Parentheses
2. Exponentiation (including square roots)
3. Multiplications and divisions (from left to right)
4. Additions and subtractions (from left to right)

Have a try!

- $1 + 2 \times 4 = 9$
- $(1 + 2) \times 4 = 12$
- $7 + (3 \times 15 - 5) \div 8 - 13 = ?$

$\boxed{\text{CE}}$: Clear Entry 清零屏幕上所有输入
$\boxed{\text{C}}$: Clear 清零之前所有输入

Demo: Memory Buttons

Buttons

1. $\boxed{\text{MR}}$: Memory Recall
2. $\boxed{\text{MC}}$: Memory Clear
3. $\boxed{\text{M+}}$: Memory Plus
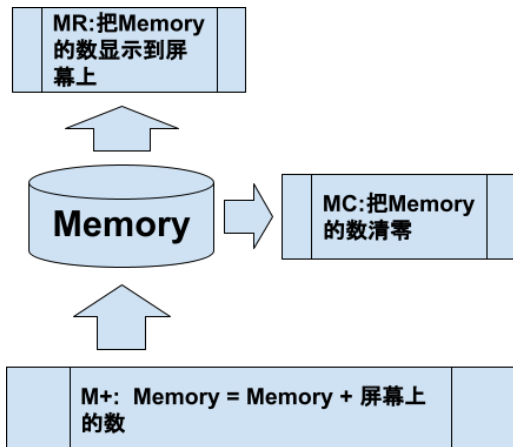
图: How $\boxed{\text{MR}}$, $\boxed{\text{MC}}$, $\boxed{\text{M+}}$ works

Have a try!

1. If a car run 33 miles with 20 gallons gas, how many gallons will the car use for 1 mile? With 45 gallons of gas, how many miles can the car run?

2. Convert this fraction to decimal.
$$\frac{43 \times 6 + 21 \times 80 + 16 \times 100}{43 + 21 + 16}$$

3. Calculate the Standard Deviation of ages for Alice(56 years-old) and Bob(73 years-old).

图: The "M" symbol will appear on the left of the display.

"±" dose not suggest that the calculator will perform the plus and minus operation at the same time. "±" suggest a negative sign is added to the number on the display.

Have a try!

1. Compute $-\frac{8.4+9.3}{70}$:

   $\boxed{(}$ 8.4 $\boxed{+}$ 9.3 $\boxed{)}$ $\boxed{\div}$ 70 $\boxed{=}$ $\boxed{\pm}$

2. Compute $(-15)^3$:

   15 $\boxed{\times}$ 15 $\boxed{\times}$ 15 $\boxed{=}$ $\boxed{\pm}$

先得出数字，然后按 $\sqrt{}$

Find the length, to the nearest 0.01, of the hypotenuse of a right triangle with legs of length 21 and 54;

Compute $\sqrt{21^2 + 54^2}$:

21 $\boxed{\times}$ 21 $\boxed{+}$ 54 $\boxed{\times}$ 54 $\boxed{=}$ $\boxed{\sqrt{}}$

Demo: Deal with Error

按 C ；减小运算位数

图: The error on the display

Why do you got an error?

- Undefined Behaviors For Real Numbers
    - Divided by zero:
      6 ÷ 0 = **Error**
    - The Square root of a negative:
      7 ± √ **Error**
- The 8-Digits Limit
    - 99,999,999 is the maximum allowable number:
      10000000 × 10 = **Error**
    - 0.0,000,001 is the minimum positive number:
      0.0000001 ÷ 10 = 0.

Incomplete brackets will not cause an error. 1 + (10 = 11

To purchase a new sweater, Kledia paid $51.41, which was the sum of the selling price plus 6 percent sales tax on the selling price. How much was the sales tax?

- ○ $1.41
- ○ $1.95
- ○ $2.41
- ○ $2.91
- ○ $3.08

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- ○ \$1.41
- ○ \$1.95
- ○ \$2.41
- ○ \$2.91
- ○ \$3.08

$51.41 \boxed{\div} \boxed{(} 1 \boxed{+} 0.06 \boxed{)} \boxed{\times} 0.06 \boxed{=} 2.91 \text{ D}$

How much more is 20 percent of x than $\frac{1}{5}$ of 1 percent of x?

- ○ $\dfrac{x}{19.8}$

- ○ $0.18x$

- ○ $0.192x$

- ○ $0.198x$

- ○ $19.8x$

How much more is 20 percent of x than $\frac{1}{5}$ of 1 percent of x?

- $\bigcirc\ \dfrac{x}{19.8}$
- $\bigcirc\ 0.18x$
- $\bigcirc\ 0.192x$
- $\bigcirc\ 0.198x$
- $\bigcirc\ 19.8x$

$0.2 - 0.2 \times 0.01 = 0.198$ D

1. Arithmetic 算术
2. Algebra 代数
3. Geometry 几何
4. Data Analysis 数据分析

1 Min Break

Questions? Comments?