



# Mag<sup>✓✓</sup>sh's Complete Guide to the GRE



# Table of Contents

Table of Contents .....	1
Introduction.....	3
The Magoosh Team .....	3
About Us.....	4
What is Magoosh? .....	4
Featured in .....	4
Why Our Students Love Us .....	5
Meet the Revised GRE .....	7
Breakdown.....	7
How is the Revised GRE Scored?.....	9
Adaptive Nature .....	10
The Quantitative Section .....	12
Question Types: Multiple Choice .....	12
Question Types: Multiple Answer Questions (MAQs).....	13
Question Types: Numeric Entry .....	15
Question Types: Quantitative Comparison.....	16
Pacing Strategies .....	18
Calculator Strategies.....	20
Math Formula Cheat Sheet .....	24
Basic Concepts: Algebra .....	27
Basic Concepts: Combinations and “Permutations” .....	29
Basic Concepts: Probability .....	36
Basic Concepts: Factorials .....	41
Basic Concepts: Data Interpretation.....	42
Practice Questions .....	47
Verbal Section .....	51
Question Types: Text Completions .....	51
Question Types: Sentence Equivalence .....	53



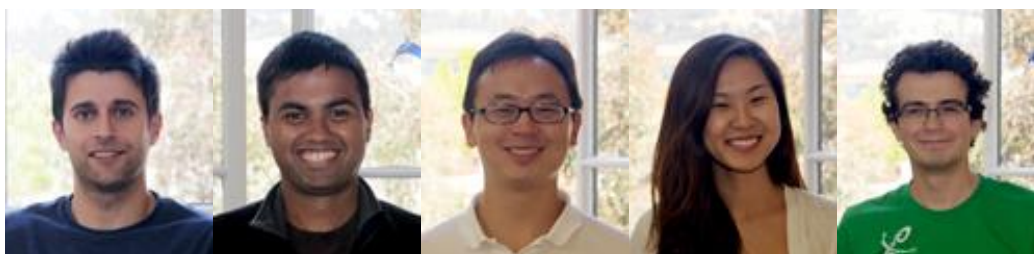
Question Types: Reading Comprehension .....	55
Question Types: Argument Questions (Critical Reasoning) .....	57
Pacing Strategies .....	59
Vocabulary: Learning in Context .....	61
Vocabulary: Magazines and Newspapers .....	63
Practice Questions .....	67
Analytical Writing Assessment .....	72
The Argument Essay .....	74
The Issue Essay .....	76
Resources .....	78
Study Plans .....	78
Official Practice Material from ETS .....	79
Book Reviews .....	82

# Introduction

This eBook is meant to serve as an introduction to the revised GRE and combines information from some of the most popular posts on the [Magoosh GRE blog](#). If you're new to the GRE, and want to know what to expect and how to prepare, this eBook is for you!

If you're already familiar with the exam and are looking for in-depth study material, head over to the [Resources section](#).

## The Magoosh Team



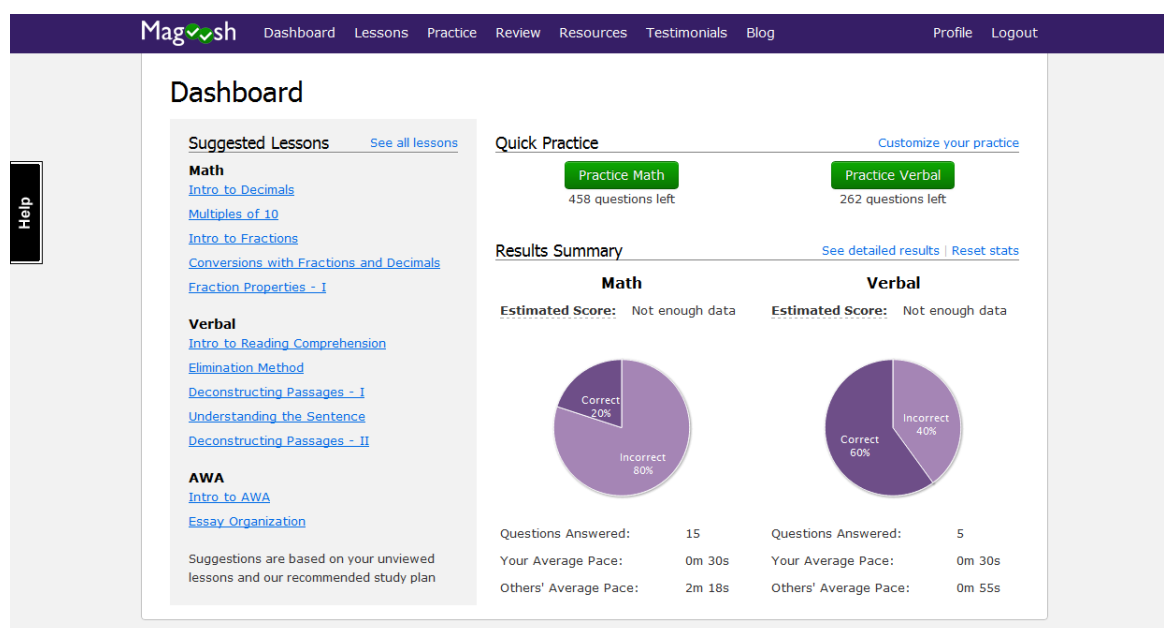
E-mail us at [support@magoosh.com](mailto:support@magoosh.com) if you have any questions, comments, or suggestions!

# About Us

## What is Magoosh?

Magoosh is online GRE Prep that offers:

- Over 200 Math, Verbal, and AWA lesson videos. That's over 20 hours of video!
- Over 1000 Math and Verbal practice questions, with video explanations after every question
- Material created by expert tutors who have in-depth knowledge of the GRE
- E-mail support from our expert tutors
- Customizable practice sessions and mock tests
- Personalized statistics based on performance
- Access anytime, anywhere from an internet-connected device



## Featured in

THE WALL STREET JOURNAL

San Francisco Chronicle

The Boston Globe

The Telegraph  
calcutta, india

KTVU FOX 2

XXconomy

## Why Our Students Love Us

These are survey responses sent to us by students after they took the GRE. All of these students and thousands more have used the [Magoosh GRE prep course](http://magoosh.com/gre/gre-ebook) to improve their scores:



<b>What was your overall score on the actual exam? *</b>	311
<b>What was your math score?</b>	156
<b>What was your verbal score?</b>	155
<b>How did our product help you? *</b>	It was really great, the questions (a few of them - math) were the same as the once i solved in Magoosh practice problems. I plan to write a testimonial, will do it once i'm good and ready. Right now i need a break... but not before i thank you guys, So a huge "THANK YOU" to all you guys at Magoosh and specially Chris, coz' he was the one i pestered the most, with an interminable flow of asinine questions and he answered everyone of them. Thank you!!!



<b>What was your overall score on the actual exam? *</b>	307
<b>What was your math score?</b>	150
<b>What was your verbal score?</b>	157
<b>How did our product help you? *</b>	It helped familiarize me with the types of questions that were going to be present on the GRE. I'm an audiovisual learner, so the lessons were particularly helpful for my needs.



<b>What was your overall score on the actual exam? *</b>	306
<b>What was your math score?</b>	144
<b>What was your verbal score?</b>	162
<b>If you took the GRE before, what was your previous math score?</b>	500
<b>If you took the GRE before, what was your previous verbal score?</b>	580
<b>How did our product help you? *</b>	<p>This product allowed for timed practice which I found essential. I was very slow with the previous GRE and ran out of time on everything. When I took the test in february I found that practice paid off with me having nearly 10minutes to spare at the end of each verbal section. For the math, I still wasnt computing the answers fast enough, but I gained a sense of timing from your software and was able to finish quickly and go back to answer more time consuming questions.</p> <p>The short lessons were immensely helpful and the swift feedback that I received when I placed a query was unbelievable. It was really nice to be able to get a quick and simple refresher on content long forgotten or muddled by time.</p> <p>This software, most importantly, gave me confidence. I went through each section very calmly. Even if I wasn't doing particularly well. My reasoning was - it was highly unlikely that I had completed hundreds of timed practice questions and watched all those lessons with no improvement as the result. By sheer repetition and exposure, my knowledge base had to have increased. (and it did. undoubtedly)</p>



**What was your overall score on the actual exam? \*** 328

**What was your math score?** 161

**What was your verbal score?** 167

**How did our product help you? \***

Before anything else I want to extend a sincere "thank-you" to everyone at Magoosh. I used the site to both organize my study plan and work with the material itself. I watched every instructional video for the math content available at the time. The instructional videos are brilliant, I really appreciated having the flexibility to pause a video, absorb the information and re-play it if I needed to. The video explanations for each problem were also an excellent tool. I used the adaptive exam software to simulate timed GRE sections and target weak areas in math. I also read the blog for exam tips and strategies. When I began to study for the GRE my scores hovered in the low-mid 600s on the old scale; the score I ultimately got represents a 100-150 point difference in each category. The Magoosh staff was awesome; I peppered them with questions and requests and they always responded thoroughly and quickly.



**What was your overall score on the actual exam? \*** 319

**What was your math score?** 156

**What was your verbal score?** 163

**How did our product help you? \***

I had started some light studying last year and didn't really know where to start. I was using with a couple of GRE prep books, but I felt a little lost - especially when I discovered that one of the books was rife with errors. I found Magoosh via Christopher's prep-book reviews (brilliant marketing, by the way) and signed up after using the demo for a few days. The information is clear and the strategies work well and, if you have questions, the team responds to your fairly quickly (I sent two emails and received responses within a day).



**What was your overall score on the actual exam? \*** 313

**What was your math score?** 163

**What was your verbal score?** 150

**How did our product help you? \***

The help provided by the magoosh platform was superb. What I believe most valuable is the fact that most math problems are somewhat harder, so when you're actually taking the test, everything seems a little bit easier.



**What was your overall score on the actual exam? \*** 315

**What was your math score?** 159

**What was your verbal score?** 156

**How did our product help you? \***

Your product was excellent. I'm going back to school after 20 years in business and had to re-learn all of the math. The videos were outstanding at teaching me the lessons. Also, the ability to develop mock tests were crucial to my success. The difficulty of your questions made the GRE a bit easier on the math side than I expected. The study plan kept me on track so that I could study in the 4 weeks I had between semesters.

# Meet the Revised GRE

## Breakdown

### The Sections

The Revised GRE will consist of two Verbal sections, two Quantitative sections, and one experimental section, which can be either Verbal or Quant. The experimental section will not count towards your score. You will receive an overall Quantitative score in the 130 to 170 range, and an overall Verbal score, also from 130 to 170. Thus, the Revised GRE is out of 340.

### Number of questions and time limit

For the computer-based exam, the Verbal sections contain 20 questions each. You will be given 30 minutes to complete each section. The Quantitative sections also consist of 20 questions each, but you will have 35 minutes to complete each section.

### The Quantitative Sections

The Quantitative section is made up of about 7 Quantitative Comparison Questions and 13 non-Quantitative Comparison questions (a majority of which will be Multiple Choice, with a few (1-2) Numeric Entry and Multiple Answer questions each).

[Multiple Choice](#) is pretty standard—you'll just have to identify the one possible correct answer.

[Multiple Answer](#) can have up to 10 answer choices, and you'll have to "select all that apply", which means that the number of correct answers is also unknown.

[Numeric Entry](#) is an open-ended question type in which you will have to type in the correct value.

[Quantitative Comparison](#) will list two quantities, A and B (anything from algebraic expressions to the side length of a given geometric shape) and ask you to compare them and select one of the following: A is equal to B, A is greater than B, A is less than B, or that the relationship between the two quantities cannot be determined from the information given.

Additionally, there is a basic on-screen calculator that you will have access to during the Quantitative sections.



## The Verbal Sections

The Verbal Section is made up of about 6 Text Completions, 4 Sentence Equivalence questions, and 10 Reading Comprehension questions.

[Text Completions](#) can have one to three blanks, and range from short sentences to a four-sentence paragraphs. For two- and three-blank Text Completion questions, you must answer each blank correctly to receive full points—no partial credit!

[Sentence Equivalence](#) questions have six possible answer choices. For every Sentence Equivalence question, there will be two correct answers. To receive any credit you must choose both correct answers.

[Reading Comprehension](#) passages range from 12 to 60 lines. Topic matter is usually academic in nature and covers areas such as science, literature, and the social sciences. Question types include standard multiple-choice questions, highlight the passage questions, and multiple-answer questions, which require you to choose any one of three possible answer choices.

## The Writing Section

To begin the test, there are two essays, and you'll be given 30 minutes for each: [The Issue](#) and [The Argument](#). Neither is part of your 130 - 170 score. Each essay receives a score ranging from 0 - 6. Your final essay score is the average of both essay scores.

We have in-depth examples and strategies for each section later in this book.

## How is the Revised GRE Scored?

The Revised GRE scale may seem pretty arbitrary. After all, who has ever been graded on a test from 130 - 170? Not that the 200 - 800 scale was standard, but, still, there was a certain panache in being able to say, “*I got an 800!*” (a 170 sounds far from perfect). And, just to clarify, both these scales apply to the verbal section and math section, so, technically, the new GRE is out of 340 (which sounds just as awkward).

So, why the strange range (pardon the rhyme)? Well, according to ETS, they wanted to stick to three digits so that the colleges wouldn’t have to overhaul all the textbox entries that call for three digits. Fair enough. Also, to avoid confusion with the current scoring system, ETS made sure the two score ranges didn’t overlap (had they made the new GRE out of 200, then a person who’d gotten that score on the current GRE would suddenly look a lot smarter if they were to say a few years from now, “Hey, I got a 200 on the GRE verbal section”).

On the surface, the new GRE scoring range appears to be more limited than that of the current system. After all, 200 - 800, based on 10-point intervals, allows for only a 61-point spread, compared to the new GRE’s 41-point spread, based on one-point intervals. The new GRE makes up for this more limited range by giving more significance to the extreme ends of the scale. For example, on the current GRE, there really isn’t much difference between 730 and 800 on the verbal—they are both in the 99th percentile range. On the new GRE, the difference between 165 and 170 will be the 99th percentile vs. the 96th percentile.

At the end of the day, you are not going to be tested on these statistical nuances. The important thing to remember is that many colleges base their rankings on a percentile score, which you will also receive as part of your score report.

## Adaptive Nature

On the old GRE, the test adapted within each section. The computer would assume that every test taker was equal and would typically start with a mid-range question. If the test taker answered a few questions correctly, the test would become progressively difficult. And if the test taker answered the questions incorrectly, the test would become progressively easier.

The old GRE algorithm is slightly more nuanced than this, but really the details, at this point, are moot. We only care about the Revised GRE.

## The Revised GRE adapts between sections

A salient difference between the old GRE and Revised GRE is that the Revised GRE has two sections for Math and two sections for Verbal. The old GRE had one section for each. That the Revised GRE has two sections for each subject is significant—this allows ETS to make the test adapt between sections.

## There is no adaptation within section

The section adaptation is the only adaptation that happens on the Revised GRE. What this means is that the questions do not change depending on whether you answer them correctly. Think of it this way - each section is static. Your performance on the first section will determine whether you get an easy section or a difficult section. The easy section is static and the difficult section is static. Again, this means the questions in the section do not change. You could miss the first ten and question 11 will still be question 11; you could work backwards from the last question, nailing all of them, and question 11 is still question 11.

## The level of difficulty of questions is random

Even though a section is static it doesn't mean that, theoretically, it couldn't become progressively harder. After all, this is what the old old GRE (meaning the paper-based 1990 GRE) was like. However, there is no order of difficulty on the Revised GRE. The first question can be the hardest and the last question the easiest.

## Each question is weighted the same

Do not spend 5 minutes trying to answer the question in which four circles are wedged inside some octagon (actually, that would make an interesting question - but another time!). Each question is basically weighed the same. So the question that gives you the radius and asks for the area, which should take no more than 15 seconds, is worth the same as the one about the monstrous polygon.

## Can you let up at the end?

Again, each question is weighted the same - and the computer hasn't "figured you out" the way it supposedly did with the old GRE. Your score on the Revised GRE is based on how many questions you miss. The point here is that you do not reach a certain level in which the computer "thinks" you are doing very well (à la the old GRE). So do not slack off at the end, thinking you answered most questions correctly and now you're set.

The only reason I even mention this - as it is counterintuitive - is because many are still operating under the conception of the old GRE, in which you could, at least somewhat, slack off at the end without hurting your score too much.

## Takeaways

- The Revised GRE does not adapt within a section, only between sections
- Each question is weighted the same
- Difficult questions and easy questions are randomly mixed throughout the section

# The Quantitative Section

## Question Types: Multiple Choice

Just a regular multiple choice question, with only one right answer! Here's an example—try it out for yourself before checking the explanation below.

Which of the following equations is true for all positive values of  $x$  and  $y$ ?

- A.  $\sqrt{x} + \sqrt{y} = \sqrt{x+y}$
- B.  $\sqrt{x^4 y^{16}} = x^2 y^4$
- C.  $(x\sqrt{y})(y\sqrt{x}) = x^2 y^2$
- D.  $y\sqrt{x} + y\sqrt{x} = \sqrt{4xy^2}$
- E.  $(x^y)(y^y) = (xy)^{2y}$

*Answer and Explanation:*

Which of the following equations is true for all positive values of  $x$  and  $y$ ?

- |   |  |
|---|--|
| <del>(A)</del> $\sqrt{x} + \sqrt{y} = \sqrt{x+y}$ | (A) $\sqrt{x} + \sqrt{y} = \sqrt{x+y}$<br>$\sqrt{4} + \sqrt{9} \neq \sqrt{4+9}$  |
| <del>(B)</del> $\sqrt{x^4 y^{16}} = x^2 y^4$      | (B) $\sqrt{x^4 y^{16}} = x^2 y^4$<br>$\sqrt{x^4 y^{16}} = x^2 y^8$<br>Proof: $(x^2 y^8)(x^2 y^8) = x^4 y^{16}$                                     |
| <del>(C)</del> $(x\sqrt{y})(y\sqrt{x}) = x^2 y^2$ | (D) $y\sqrt{x} + y\sqrt{x} = \sqrt{4xy^2}$<br>$2y\sqrt{x} = \sqrt{4y^2} \sqrt{x}$<br>$= \sqrt{4xy^2}$  |
| <del>(E)</del> $(x^y)(y^y) = (xy)^{2y}$           | (E) $(x^y)(y^y) = (xy)^{2y}$<br>$(x^y)(y^y) = (xy)^y$ <span style="border: 1px solid black; padding: 2px;"><math>(x^n)(y^n) = (xy)^n</math></span> |

You can try this question online and watch the explanation video here:

<http://gre.magoosh.com/questions/724/>

## Question Types: Multiple Answer Questions (MAQs)

The new GRE is officially calling these Multiple Choice Questions: Select One or More Answers. For brevity—and clarity's sake—I'm going to call them MAQs: Multiple Answer Questions.

Doesn't sound too complicated? Well, I could ask you to imagine a question that has ten possible answer choices, any number of which could be correct. Or, I could just ask you to turn to page 123 of the ETS Revised GRE book, for those of you who've already picked up a copy.

Those well-versed in their combinations/permutations problem know the chances of guessing correctly on this question is 1 in 1,023, odds so slim the question might as well have been a big empty fill-in the blank (yeah, the Math section has those too).

I'm probably making the Quantitative MAQ's sound scarier than they actually are. Most will probably only have five or six possible answer choices, not ten. The bottom line: if you know the concept being tested, and are careful and methodical, then you should be able to get this cumbersome question type correct.

Here is an example of an MAQ that I think you should definitely be capable of getting right if you're careful:

If  $n$  is a two-digit number, in which  $n = xy$ . If  $x + y < 8$ , and  $x$  and  $y$  are positive integers greater than 1, then the units digit of  $n$  could be which of the following?

- A. 0
- B. 1
- C. 2
- D. 3
- E. 4
- F. 5
- G. 6
- H. 7
- I. 8
- J. 9

As a side note, on the actual Revised GRE, each answer choice will have a square around it. When you see the square you know you're dealing with Multiple Answer Questions. If there is a circle around the answer choice, then it is business as usual—one answer only.

As for the question above, the answers are B, C, E, F, G, and H.

If you missed the question, remember that  $x + y$  has to be less than 8. Also, make sure you write something down when tackling Multiple Answer Questions. Trying to juggle all the information in your head will surely get you in trouble.



## Question Types: Numeric Entry

Two trains starting from cities 300 miles apart head in opposite directions at rates of 70 mph and 50 mph, respectively. How long does it take the trains to cross paths?

This is a classic problem that sends chills up students' spines. I'm now going to add another bone rattling element: The Empty Box.

That's right—the GRE will have fill-in-the blank/empty box math problems, called Numeric Entry. There won't be too many, judging from the ETS Revised GRE book, but even a few should be enough to discomfit most.

Let's go back and attack the above problem the following way. When you have any two entities (trains, bicyclists, cars, etc.) headed towards each other you must add their rates to find the combined rate. The logic behind the combined rate is the two trains (as is the case here) are coming from opposite directions, straight into each other.

This yields 120 mph, a very fast rate (which accounts for the severity of head-on collisions...don't worry, the trains in the problem won't collide!).

To find the final answer, we want to employ our nifty old formula:  $D = RT$ , where D stands for distance, R stands for rate, and T stands for time.

We've already found R, which is their combined rate of 120 mph. They are 300 miles apart so that is D. Plugging those values in, we get  $300 = 120T$ . Dividing 120 by both sides, we get  $T = 2.5$  hrs.

Now we can confidently fill that box in, and let the trains continue on their respective ways.



## Question Types: Quantitative Comparison

Quantitative Comparison (QC) is a huge part of the GRE, roughly one-third of the Quant section. Often, when prepping, you may forget this fact and spend much more time on problem solving. Quantitative Comparison is a unique beast—while the math concepts are the exact same as those covered in Problem Solving, QC can be very tricky. In fact, the test writers work very hard to make these questions seem very straightforward. Yet, there is usually a trap or twist, waiting to ensnare the unsuspecting test taker.

The format will always be the same: comparing two quantities (Column A vs. Column B), with the same 4 answer choices that evaluate the relationship between the two quantities. However, the quantities for Column A and B can be anything from expressions with variables to references to a quantity in a geometric shape.

### Column A

The number of positive multiples of 49 less than 2000

### Column B

The number of positive multiples of 50 less than or equal to 2000

- A. The quantity in Column A is greater
- B. The quantity in Column B is greater
- C. The two quantities are equal
- D. The relationship cannot be determined from the information given

## The Approach

First off, we must understand what a multiple is. A multiple is any number that results when multiplying an integer,  $x$ , by 1, 2, 3, 4...

If  $x$  is equal to 5, then the multiples of 5 would be:

$$5 \times 1 = 5$$

$$5 \times 2 = 10$$

$$5 \times 3 = 15$$

$$5 \times 4 = 20$$

$$5 \times 5 = 25$$

$$5 \times 6 = 30...$$

From the table above, we can see that any multiple of 5 is divisible by 5. For instance,  $1000/5 = 200$ . Therefore, 1000 is a multiple of 5.

The question above asks us how many multiples of 49 are less than 2000. We can divide 2000 by 49 to see how many multiples of 49 are less than 2000. Doing so may take a while. A faster way is to note that 49 is very close to 50. Quick math allows us to determine that  $50 \times 40$  is 2000. Therefore,  $49 \times 40$  equals 40 less than 2000, or 1960. If we were to multiply  $49 \times 41$ , we are adding  $1960 + 49$ , which takes us to 2009. This is greater than 2000. Therefore, we know that there are only 40 multiples of 49 less than 2000.

What about column B? Well, we've already figured out that  $40 \times 50$  equals 2000. But, here is the tricky part. Whereas Column A stipulated that the number has to be less than 2000, Column B says the number has to be less than OR equal to 2000. Therefore, there are 40 multiples of 50 that are less than or equal to 2000. (I wrote this question, and I know it is evil. But sneakily adding a couple of words that changes the answer is a classic trick employed by the writers of the test).

Answer: C.

## First Instincts

There is a good chance that your first instinct was A. Clearly, 49 is lower than 50, so it has to have more multiples. Usually, when the answer to a Quantitative Comparison question appears obvious at first glance, there is some twist to the problem. In this case, the twist was the wording in Column B: less than or equal to 2000. So, be wary of any QC questions that seem too easy. Look for a twist or a trap.

## Pacing Strategies

Each math section contains 20 questions. You are given 35 minutes for each section, which works out to 1:45 seconds per question. Below are some helpful tips to help you wisely use these 35 minutes.

### Go for the low hanging fruit

Each question in the GRE quantitative section is worth the same number of points. That is such an important point that I am going to repeat it again (in caps): EACH QUESTION ON THE GRE SECTION IS WORTH THE SAME NUMBER OF POINTS.

That's right, folks. If ETS devised a question such as the following:

$$\frac{(100! - 99!)^{100} - (99! - 98!)^{100}}{(98! - 97!)^{100}} =$$

The five minutes you'd take to (maybe) answer the question correctly will yield the exact same number of points as this question:

If  $2^x = 4^2$ , what is the value of x?

So what's the takeaway from this? Other than, "Factorials scare the living <expletive> out of me!"?

Well, why waste time on a very difficult question when you can simply scroll to an easier question? Think of it this way: in 35 minutes you want to score as many points as you can, and each question is worth the same.

If I paid you 1,000 dollars for every apple you picked from a tree in 35 minutes, what would you do? You would go for the low hanging fruit. You would not waste your time climbing to the very top of the tree to pluck an apple that is worth the same amount of money as an apple that you can simply reach out and grab with both your feet planted on the ground.

Of course, after a certain point—that is to get a high score—you must grab the fruit up on high, and go for the difficult questions. But make sure you've answered the easy ones first.

### How much time should I budget per question?

The answer differs depending on how difficult the question is. Think of it this way. There are easy questions, medium questions, and difficult questions. Easy questions should take between 45 seconds and 1 minute. Medium questions should take between 1:00 - 2:00. And difficult questions

should take no longer than 3 minutes. The ratio of easy, medium, and difficult questions vary per section but in general you can expect to see a smattering of each. On the easy section, the ratio will skew towards easy; in the difficult section that ratio will skew towards difficult.

## **Learning to let a question go**

If you are staring at a question and have been unable to devise a solution after a minute, you should seriously consider moving on to the next question. Again, keep the low-hanging fruit metaphor in mind.

If, however, you are dealing with a difficult math question (and it is clear that it *is* difficult, and you're not just missing something obvious), then take a couple of minutes, as some questions will clearly take that much time. Do not freak out on a question that is clearly convoluted just because you've taken 2 minutes. As long as you are headed toward the solution, persevere.

## **Do not be sloppy but do not obsess over easy questions**

Using the time schematic above, we can see that easy questions can take less than a minute. It is important to answer these questions confidently and move on. If you dither, then that is time that could be spent on a more difficult question. However, do not race through an easy question, because then it defeats my whole low-hanging fruit sermon—missing a question that you could easily have answered correctly had you spent that extra second does not make sense (especially if you are racing towards difficult questions that you may not even answer correctly in the first place).

## **Make sure you guess**

You do not even have to approach every question, especially the difficult ones, as I mentioned above. But make sure at the very end that you guess on any questions remaining, because there is no penalty for guessing. So if you've been skipping a lot of questions, give yourself enough time at the end to bubble in the questions you left blank. A little bit of luck can go a long way!

## Calculator Strategies

For many students, the addition of the GRE's onscreen calculator to the new exam is a godsend. These students take solace in the notion that this new calculator will help them solve tons of questions. The truth of the matter is that almost all math questions on the Revised GRE can be solved without a calculator. Furthermore, in many cases, it will actually take longer to solve a question using a calculator than it will to use other techniques. Finally, the test-makers are taking questions that can be easily solved with a calculator and changing the numbers in order to render the calculator useless.

For example, a former GRE question would have asked you to evaluate  $203^2 - 201^2$ . The slow solution was to perform the actual (tedious) calculations. The fast solution was to recognize that this difference of squares can be factored as  $(203 + 201)(203 - 201)$ , which equals  $(404)(2)$ , which equals 808.

Since this question would be too easy to solve using the onscreen calculator, the test-makers will change the question to  $20003^2 - 20001^2$  where  $20003^2$  and  $20001^2$  have too many digits for the calculator to handle. As such, you'll have to solve this question using factoring techniques.

Aside: the onscreen calculator displays up to eight digits. If a computation results in a number greater than 99999999 then an ERROR message is displayed. When you evaluate  $20,003^2$  you get a 9-digit number.

Now, despite the test-makers' attempts to remove the calculator from your arsenal, there are times when you can make a few adjustments to a question and then quickly answer it with the calculator.

We can solve the following question using a variety of techniques and strategies:

<u>Column A</u>	<u>Column B</u>
$641713 \times 451222$	$897189 \times 318977$

- A. The quantity in Column A is greater
- B. The quantity in Column B is greater
- C. The two quantities are equal
- D. The relationship cannot be determined from the information given

Notice that these numbers yield products that are too big for the calculator to handle. However, with a few adjustments we can use a new strategy with the calculator to answer the question.

One solution is to first divide each column by 1,000,000. When we do this, we get:

$$\frac{\text{Column A}}{641713 \times 451222} \\ \hline 1000000$$

$$\frac{\text{Column B}}{897189 \times 318977} \\ \hline 1000000$$

From here, we can rewrite this as:

$$\text{Column A} \\ 641713 \times \frac{451222}{1000000}$$

$$\text{Column B} \\ 897189 \times \frac{318977}{1000000}$$

And this is the same as:

$$\text{Column A} \\ 641713 \times 0.451222$$

$$\text{Column B} \\ 897189 \times 0.318977$$

At this point, we can use the calculator enter all of these values, and each resulting product will have fewer than 8 digits.

So, with a small modification, we can answer this question using a calculator.

Now, can you think of another approach that allows you to use a calculator to solve the original question (without dividing by 1,000,000 or any other powers of 10)?

Here's the original question:

$$\text{Column A} \\ 641713 \times 451222$$

$$\text{Column B} \\ 897189 \times 318977$$

Another approach is to first divide both sides by 641,713 to get:

$$\text{Column A} \\ 451222$$

$$\text{Column B} \\ \frac{897189 \times 318977}{641713}$$

Then, divide both sides by 897,189 to get:

Column A

$$\frac{451222}{897189}$$

Column B

$$\frac{318977}{641713}$$

At this point, we can enter all of these values into the calculator and compare the columns.

Next, we'll examine another strategy to thwart the Revised GRE and use the onscreen calculator to solve questions that, at first glance, appear to render the calculator useless:

The square root of 2 billion is between

- A. 2,000 and 5,000
- B. 5,000 and 15,000
- C. 15,000 and 30,000
- D. 30,000 and 50,000
- E. 50,000 and 90,000

Try to identify at least two ways to solve the above question.

Aside: Please notice that 2 billion is too large to fit in the onscreen calculator.

## Non-calculator strategy

This approach uses the following rule:

$$\sqrt{ab} = \sqrt{a} \sqrt{b}$$

First, we need to recognize that:

$$\sqrt{2 \text{ billion}} = \sqrt{2,000,000,000}$$

$$\sqrt{20 \times 100,000,000}$$

$$\sqrt{20} \sqrt{100,000,000}$$

$$\sqrt{20} \times 10,000$$

From here, we can see that since  $\sqrt{16} = 4$  and  $\sqrt{25} = 5$  then  $\sqrt{20}$  must lie between 4 and 5. In other words, we can say that  $\sqrt{20}$  equals 4.something.

If  $\sqrt{20}$  equals 4.something, then  $\sqrt{20 \times 10,000}$  must lie between 40,000 and 50,000.

As such the answer must be D.

## Calculator strategy

With a slight modification, we can use the onscreen calculator to solve the question within seconds.

First recognize that:

$$\sqrt{2 \text{ billion}} = \sqrt{2,000,000,000}$$

$$\sqrt{2,000 \times 1,000,000}$$

$$\sqrt{2,000} \sqrt{1,000,000}$$

From here we can use the calculator to evaluate both roots. When we do this, we get:

$$\sqrt{2,000} \sqrt{1,000,000} = 44.7 \times 1,000 = 44,700$$

So, the answer must be D.



# Math Formula Cheat Sheet

While this is a very useful cheat sheet, do not just memorize formulas without actually applying them to a question. Often students will see a question and will assume that a certain formula is relevant. This is not always the case. So make sure you practice using the formulas so you will know when they pertain to a question.

## Interest

Simple Interest:  $V = P \left( 1 + \frac{rt}{100} \right)$ , where P is principal, r is rate, and t is time

Compound Interest:  $V = P \left( 1 + \frac{r}{100n} \right)^{nt}$ , where n is the number of times compounded per year

## Work Rates

$$\frac{1}{TotalWork} = \frac{1}{WorkRate1} + \frac{1}{WorkRate2}$$

## Sets

$$A + B - (A \cup B)$$

## Distance, Rate, and Time

$$D = rt, \text{ Distance} = \text{Rate} \times \text{Time}$$

## Circles

$$Area = \pi r^2$$

$$Circumference = 2 \pi r$$

$$Arc \ Length = \frac{x}{360} 2 \pi r$$

$$Area \ of \ sector = \frac{x}{360} \pi r^2$$

## Squares

*Perimeter* =  $4s$ , where  $s$  = side

$$\text{Area} = s^2$$

## Rectangles

*Area* =  $l \times w$ , where  $l$  = length and  $w$  = width

$$\text{Perimeter} = 2l + 2w$$

## Trapezoids

$$\frac{\text{Base}_1 + \text{Base}_2}{2} \times \text{height}$$

## Polygons

*Total degrees* =  $180(n - 2)$ , where  $n$  = # of sides

$$\text{Average degrees per side or degree measure of congruent polygon} = 180 \frac{(n - 2)}{n}$$

## The Distance Formula

$$\sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

## Prime numbers and integers

1 is not a prime. 2 is the smallest prime and the only even prime.

An integer is any counting number including negative numbers (e.g. -3, -1, 2, 7...but not 2.5)

## Fast Fractions

$$\frac{1}{x} + \frac{1}{y} = \frac{x+y}{xy} \quad \text{i.e.} \quad \frac{1}{2} + \frac{1}{5} = \frac{2+5}{2 \times 5} = \frac{7}{10}$$

## Divisibility

3 : sum of digits divisible by 3

4 : the last two digits of number are divisible by 4

5 : the last digit is either a 5 or zero

6 : even number and sum of digits is divisible by 3

8 : if the last three digits are divisible by 8

9: sum of digits is divisible by 9

## Combinations and Permutations

$${}^nC_r = \frac{n!}{r!(n-r)!}$$

n is the total number, r is the number you are choosing

$${}^nP_r = \frac{n!}{(n-r)!}$$

## Probability

$$\text{Probability of event} = \frac{\text{number of ways that fit the requirement}}{\text{number of total ways}}$$

## Basic Concepts: Algebra

The FOIL method is one that almost everybody remembers learning at some point, circa middle school. Though you may have forgotten the details, with a little practice, you should be able to use it effectively.

First off, FOIL stands for First, Outer, Inner, and Last, and refers to the position of numbers and/or variables within parenthesis. Let's have a look:

$$(x - y) \times (x + y) = ?$$

Remember when parentheses are joined together, there is an invisible multiplication sign. The tricky part is how to multiply together a bunch of x's and y's. The answer: the FOIL method.

- F (First): The first term in each parentheses is x, so we multiply the x's together to get:  $x^2$
- O (Outer): The term on the outside of the left parenthesis is 'x' and on the outside of the right parenthesis is 'y'. We multiply the two together to get:  $xy$ .
- I (Inner): Now we multiply the inner terms in each parenthesis:  $(-y)(x) = -xy$
- L (Last): Finally, we multiply the terms that are the rightmost to get  $(-y)(y) = -y^2$

Now we add together our results  $F + O + I + L : x^2 - xy + xy - y^2 = x^2 - y^2$

$$\text{So } (x - y)(x + y) = x^2 - y^2.$$

Memorize this pattern. Do not spend time on the test actually completing the steps above.

Other important algebraic expressions to memorize are:

$$(x - y)(x - y) = x^2 - 2xy + y^2$$

$$(x + y)(x + y) = x^2 + 2xy + y^2.$$

Here are some examples in which we apply the above.

- $(x - 5)(x + 5) = x^2 - 25$
- $(a + 3)(a + 3) = a^2 + 6a + 9$
- $(b - 2c)(b - 2c) = b^2 - 4bc + 4c^2$

## Other applications of FOIL

$$(98)(102) = ?$$

$$(79)(81) = ?$$

These questions appear as though they would not relate to the FOIL method. But upon closer inspection, we can see that these numbers aren't random.

If we add them, instead of multiplying, we get 200, for the first question, and 160, for the second. Or  $100 + 100$  and  $80 + 80$ .

Let's focus on the pair of hundreds:  $100 \times 100$  vs.  $98 \times 102$ .

Notice that  $(98)(102)$  can be written as  $(100 - 2)(100 + 2)$ . Now you should see the  $(x - y)(x + y)$  form, which expressed correctly is  $100^2 - 2^2 = 9,996$ .

Solving in this way is much more effective, because  $100^2 = 10,000$ , a number you should know off the top of your head.

## Other Tips

Compare the following:

$$(x - 2)^2 = 4 \quad \text{vs.} \quad 2 = \sqrt{x - 2}$$

In the first case, there are two solutions: 0 and 4. Remember when you square a negative number, as in  $(-2)^2 = 4$ , you get a positive number.

With the equation on the right side, the one in which  $x$  is under the square root sign, if you get a negative number, you cannot take the square root of it (at least in GRE world, where imaginary numbers do not come into play).

In the case of  $2 = \sqrt{x - 2}$ , we square both sides to get  $4 = x - 2$ , so  $x = 6$ .

Watch our lesson video, "Introduction to Algebra":

<http://gre.magoosh.com/lessons/35-intro-to-algebra/>

## Basic Concepts: Combinations and “Permutations”

Whenever I see a GRE resource label its counting section as “Combinations and Permutations,” a small part of me dies a little. Okay, that’s an exaggeration, but I am concerned about the misleading message that this sort of title conveys. To me, it suggests that counting questions can be solved using either permutations or combinations, when this is not the case at all. The truth of the matter is that true permutation questions are exceedingly rare on the GRE.

Now, for those who are unfamiliar with permutations, a permutation is an arrangement of a subset of items in a set. To be more specific:

If we have  $n$  unique objects, then we can arrange  $r$  of those objects in  ${}_n P_r$  ways, where  ${}_n P_r$  equals some formula that I still haven’t memorized even though I took several combinatorics courses in university, and I taught counting methods to high school students for 7 years.

Now, it’s not that the permutation formula is too complicated to remember; it’s just that it’s unnecessary to memorize such a formula for the GRE. In my humble opinion, the permutation formula has no place in a GRE resource (even though the Official Guide covers it).

Here’s an example of a true permutation question:

Using the letters of the alphabet, how many different 3-letter words can be created if repeated letters are not permitted?

Here, we have a set of 26 letters in the alphabet, and we want to determine the number of ways we can arrange 3 of those letters. So, if we still feel compelled to use permutations to the answer the question (despite my public denouncement of permutations 😊), the answer would be  ${}_{26} P_3$  at which point you would have to evaluate this.

Of course, you’re not going to memorize the permutation formula, because you’re going to accept my premise that true permutation questions are exceedingly rare on the GRE. For the doubters out there, let’s consult the Official Guide to the GRE Revised General Test. In the Guide, there are 7 counting questions altogether. Of these 7 questions, not one is a true permutation question (although some will argue that question #6 on page 297 is a permutation question, albeit a very boring one that can be solved using an easier approach).

So, given the rarity of permutation questions, it’s dangerous to approach counting questions with the notion that all you need to do is determine whether you’re dealing with a combination or a permutation, and then apply one of two formulas. If you do this, you will inevitably conclude that a question is a permutation question when it isn’t. Notice how easy it is to turn a permutation question into a non-permutation question by simply changing a word or two. For example, see what happens when we change our original question to read:

Using the letters of the alphabet, how many different 3-letter words can be created if repeated letters are permitted?

By allowing repeated letters, the question is no longer a permutation question, which means  $26^3$  is not the solution (the solution is actually  $26^3$ ).

The truth is that we don't need the permutation formula to answer any counting question on the GRE (including question #6 on page 297 of the Official Guide). Instead, we can use the Fundamental Counting Principle (FCP). The FCP is easy to use and it can be used to solve the majority of counting questions on the GRE.

So, my approach with all counting questions is as follows:

- First, determine whether or not the question can be answered using the FCP
- If the question can't be answered using the FCP, it can probably be solved using combinations (or a combination of combinations, and the FCP)

## The Fundamental Counting Principle

If we have a task consisting of stages, where one stage can be accomplished in A ways, another stage in B ways, another in C ways . . . etc., then the total number of ways to accomplish the entire task will equal  $A \times B \times C \times \dots$

The great thing about the FCP is that it's easy to use, and it doesn't require the memorization of any formulas. So, whenever I encounter a counting question, I first try to determine whether or not the question can be solved using the FCP. To determine this, I ask, "Can I take the required task and break it into individual stages?" If the answer is yes, I may be able to use the FCP to solve the question.

To see how this plays out, let's solve the following question:

How many different 3-digit numbers are greater than 299 and do not contain the digits 1, 6, or 8?

- A. 222
- B. 245
- C. 291
- D. 315
- E. 343

So, our task is to find 3-digit numbers that adhere to some specific rules. Can we take this task and break it into individual stages? Sure, we can define the stages as:

Stage 1: Choose a digit for the hundreds position

Stage 2: Choose a digit for the tens position

Stage 3: Choose a digit for the units position

Once we accomplish all 3 stages, we will have “built” our 3-digit number.

At this point, we need to determine the number of ways to accomplish each stage.

Stage 1: In how many different ways can we choose a digit for the hundreds position? Well, since the 3-digit number must be greater than 299, the digit in the hundreds position cannot be 0, 1 or 2. The question also says that the digits 6 and 8 are forbidden. So, when we consider the various restrictions, we see that the digit in the hundreds position can be 3, 4, 5, 7 or 9. So, there are 5 different ways in which we can accomplish Stage 1.

Stage 2: In how many different ways can we choose a digit for the tens position? Well, since the tens digit can be any digit other than 1, 6 or 8, we can see that the tens digit can be 0, 2, 3, 4, 5, 7 or 9. So, there are 7 different ways in which we can accomplish Stage 2.

Stage 3: The units digit can be 0, 2, 3, 4, 5, 7 or 9. So, there are 7 different ways in which we can accomplish Stage 3.

At this point, we can apply the FCP to see that the total number of ways to accomplish all three stages (and create our 3-digit numbers) will equal the product of the number of ways to accomplish each individual stage.

So, we get  $5 \times 7 \times 7$ , which equals 245.

There are 245 different 3-digit numbers that are greater than 299 and do not contain any 1's, 6's or 8's. The answer to the original question is B.

## The Missing Step

So, we just solved the question by taking the task of building 3-digit numbers and breaking it into individual stages. From there, we determined the number of ways to accomplish each stage, and then we applied the FCP.

During the course of that solution there was a very important step that I didn't mention. I'd like to spend some time discussing that missing step, because it is very important.

Once we break a required task into stages, we should always ask, “Does the outcome of each step differ from the outcomes of the other steps?”

If the answer to this question is NO, we cannot solve the question using the FCP.



To illustrate this, please consider a new question:

A manager must create a 2-person committee from a group of 4 employees. In how many different ways can this be accomplished?

- A. 2
- B. 6
- C. 8
- D. 12
- E. 16

First, we'll take the required task and break it into individual stages as follows:

Stage 1: Choose one person to be on the committee

Stage 2: Choose another person to be on the committee

At this point, if we continue solving this question using the FCP, we'll arrive at the wrong answer. But, don't believe me just yet. Let's just continue with this approach to see where things go wrong.

Stage 1: There are 4 employees, so we can choose the first person in 4 ways

Stage 2: At this point there are 3 people remaining, so we can choose the other person in 3 ways

When we apply the FCP, we get  $4 \times 3 = 12$ , which suggests that we can create 12 different two-person committees.

However, when we examine all 12 committees, we should see a problem with this answer. To list the committees, let's let A, B, C, and D represent the four employees. This means that the 12 committees are:

AB   AC   AD   BA   BC   BD  
CA   CB   CD   DA   DB   DC

Can you see the problem?

Well, for one, we have counted AB and BA as two different committees, when they are clearly not different. Similarly, we have counted BC and CB as different committees, not to mention other pairs.

So, what's the problem here? The problem is that we're treating the outcome of Stage 1 (selecting the first person) as different from the outcome of Stage 2 (selecting the second person), when these two outcomes are the same. In each case, the selected person gets to be on the committee.

To apply the FCP, we need the outcomes to be different.

This is why we need to ask the question, “Does the outcome of each step differ from out outcomes of the other steps?” If the answer is NO (which it is in this case), then we cannot solve the question using the FCP. We must find another approach. In this particular example, the approach will be to use combinations (a topic for another day).

Aside: When we use combinations to solve the question we see that the answer to the question is 6 (answer choice B)

**BIG TAKEAWAY:** Although the FCP can be used to solve the majority of counting questions on the GRE, it won’t always work.

Okay, now let’s examine a question that looks very similar to the last question:

A manager must select 2 people from a group of 4 employees. One person will be the shop steward and the other person will be the treasurer. In how many different ways can this be accomplished?

- A. 2
- B. 6
- C. 8
- D. 12
- E. 16

First, we’ll take the required task and break it into individual stages:

Stage 1: Choose someone to be the shop steward

Stage 2: Choose someone to be the treasurer

Now we’ll ask the all-important question, “Does the outcome of each step differ from out outcomes of the other steps?” Here the answer is YES. The outcomes are definitely different. The outcome of Stage 1 is getting to be the shop steward. The outcome of Stage 2 is getting to be the treasurer. Since the outcomes are different, we can continue solving the question using the FCP.

Stage 1: There are 4 employees, so we can choose the first person in 4 ways

Stage 2: At this point there are 3 people remaining, so we can choose the other person in 3 ways

When we apply the FCP, we get  $4 \times 3 = 12$ . So, there are 12 different ways to select a shop steward and treasurer, which means the answer is D.

Finally, let’s apply our latest step to the original question:

How many different 3-digit numbers are greater than 299 and do not contain the digits 1, 6, or 8?

- A. 222
- B. 245
- C. 291
- D. 315
- E. 343

First we'll take this task and break it into individual stages as follows:

Stage 1: Choose a digit for the hundreds position

Stage 2: Choose a digit for the tens position

Stage 3: Choose a digit for the units position

Then, we'll ask, "Does the outcome of each step differ from out outcomes of the other steps?"

Here the answer is YES. The outcomes are different. For example, selecting a 6 for Stage 1 is different from selecting a 6 for Stage 2. In one case, the 6 becomes the digit in the hundreds position, and in the other case, the 6 becomes the digit in the tens position - TOTALLY DIFFERENT OUTCOMES.

Since the outcomes of each stage are different, we can continue solving the question using the FCP.

Stage 1: In how many different ways can we choose a digit for the hundreds position? Well, since the 3-digit number must be greater than 299, the digit in the hundreds position cannot be 0, 1 or 2. The question also says that the digits 6 and 8 are forbidden. So, when we consider the various restrictions, we see that the digit in the hundreds position can be 3, 4, 5, 7 or 9. So, there are 5 different ways in which we can accomplish Stage 1.

Stage 2: In how many different ways can we choose a digit for the tens position? Well, since the tens digit can be any digit other than 1, 6 or 8, we can see that the tens digit can be 0, 2, 3, 4, 5, 7 or 9. So, there are 7 different ways in which we can accomplish Stage 2.

Stage 3: The units digit can be 0, 2, 3, 4, 5, 7 or 9. So, there are 7 different ways in which we can accomplish Stage 3.

At this point we can apply the FCP to see that the total number of ways to accomplish all three stages (and create our 3-digit numbers) will equal the product of the number of ways to accomplish each individual stage.

So, we get  $5 \times 7 \times 7$ , which equals 245.

There are 245 different 3-digit numbers that are greater than 299 and do not contain any 1's, 6's or 8's. The answer is B.

Watch our lesson video, "Combinations":

<http://gre.magoosh.com/lessons/133-combinations>

## Basic Concepts: Probability

If you're like most students, you probably struggle with the GRE's time constraints, and you probably have difficulties with probability questions.

That's why we're going to examine how probability questions can provide you with a convenient opportunity to make up lost time.

To set this up, please consider the following scenario:

*It's test day, and halfway through one of the math sections, you find that you're 2 minutes behind.*

At this point, you have two options:

1. Work faster on the remaining questions (and risk making careless mistakes)
2. Guess on one of the questions and immediately make up the lost time (but risk guessing the wrong answer)

Both options are less than ideal, but I'll argue that option #2 is better than option #1, especially if you encounter a probability question.

To illustrate this, answer the following question within 20 seconds:

From a group of 5 managers (Joon, Kendra, Lee, Marnie and Noomi), 2 people are randomly selected to attend a conference in Las Vegas. What is the probability that Marnie and Noomi are both selected?

- A. 0.1
- B. 0.2
- C. 0.25
- D. 0.4
- E. 0.6

If you've already identified probability as one of your weaknesses, and if you typically fall behind time-wise, this question is a gift. You should be able to eliminate 2 or 3 answer choices and make an educated guess within seconds of reading the question.

The elimination strategy relies on the fact that most people have an innate ability to judge the relative likelihood of an event. So, for the Las Vegas question above, you can use your intuition to eliminate answer choices that just don't *feel* right.

To begin, you might ask, "Is the probability of selecting Marnie and Noomi greater than 0.5 or less than 0.5?" If it feels less than 0.5 (which it is), you can eliminate E. Of course, you'll want to

eliminate more than one answer choice, so you'll need to be more aggressive. You might ask, "Does the event seem *very* unlikely or a *little* unlikely? Your answer will allow you to eliminate additional answer choices.

If you feel that the probability seems very unlikely, you might eliminate C, D and E, leaving yourself with a good chance of guessing the correct answer (all within seconds of reading the question). If you're less aggressive, you might eliminate just D and E. That's still fine. Remember that the goal here is not to ensure that you correctly answer the question; the goal is to make up your 2 minutes and maximize your chances of guessing the correct answer.

Please note that this guessing strategy can also be used if you typically run out of time on the math sections, and you need a way to give yourself a buffer. Just remember that probability questions are the best for this (counting questions are pretty good, too).

So we used our intuition to eliminate two answer choices (D and E) in a matter of seconds. In this post, we'll use another elimination technique to help further reduce the number of answer choices to guess from.

To begin, let's review the standard probability formula. It says that, if we have an experiment where each outcome is equally likely to occur, then:

$$P(A) = [\text{\# of outcomes where A occurs}] / [\text{total \# of outcomes}]$$

So,  $P(\text{Marnie and Noomi are both selected}) = [\text{\# of outcomes where they are both selected}] / [\text{total \# of outcomes}]$

If we use this formula, it's always best to calculate the denominator first. The reason for this is twofold:

1. Calculating the denominator is typically easier than calculating the numerator. So, if we calculate the denominator first, we may gain some insight into how to calculate the numerator.
2. Calculating the denominator can help us quickly eliminate answer choices.

For the denominator in the above question, we need to determine the number of outcomes when 2 people are selected from a group of 5 people. Since the order of the selected people does not matter, this is a combination question. So, we can select 2 people from 5 people in  ${}_5C_2$  ways. When we apply the combination formula, we see that  ${}_5C_2 = 10$ . This means that:

$$P(\text{Marnie and Noomi are both selected}) = [\text{\# of outcomes where they are both selected}] / [10]$$

Now that we know the denominator equals 10, we can conclude that the probability cannot be 0.25, since it is impossible for a fraction with denominator 10 to equal 0.25

So, by calculating the denominator, we were able to eliminate one more answer choice.

At this point, we have quickly eliminated 3 answer choices (C, D and E), leaving us with a 50-50 chance of guessing the correct answer. Not bad if we don't know how to solve the question.

Now, we'll examine 2 different ways to find the correct solution to this question.

To begin, it's important to know that, when it comes to probability questions, we often have 2 distinct approaches to choose from:

- Apply various probability rules
- Apply counting techniques and the standard probability formula
- For some questions, it may be best to apply probability rules, and, in other cases, it may be best to use counting techniques. The approach you choose may also depend on your level of comfort with each strategy.

## Applying Probability Rules

To apply probability rules, I'll first ask, "What needs to occur in order for both Marnie and Noomi to be selected?"

Well, the first person selected must be either Marnie or Noomi AND the second person selected must be the remaining person. At this point, I know that I can apply the AND probability rule to solve this question.

The "AND" probability formula looks something like this:  $P(A \text{ AND } B) = P(A) \times P(B)$

Aside: Please note that there are different ways to represent this formula. One involves using conditional probability, which has some complicated notation. Rather than use this notation, I'll just add an important stipulation to the above formula. The stipulation is when we calculate  $P(B)$ , we must assume that event A has already occurred.

Okay, now let's solve the question.

I know that  $P(\text{Marnie and Noomi are both selected}) = P(\text{one of the two friends is selected first, AND the remaining friend is selected second})$

When we apply the formula, we get:

$P(M \text{ and } N \text{ both selected}) = P(\text{one of the two friends is selected first}) \times P(\text{the remaining friend is selected second})$

Now, what is the probability that one of the two friends is selected first? Well, there are 5 people to choose from, and we want one of the 2 friends to be selected. So, the probability is  $2/5$  that one of the two friends is selected first.

Now, we need to find the probability that the remaining friend is selected second. Well, first we will assume that one of the friends was already chosen on the first selection. So, at this point there are 4 people remaining, and 1 of those 4 people is the remaining friend. So, the probability is  $1/4$  that remaining friend is selected second.

This means that  $P(M \text{ and } N \text{ both selected}) = (2/5) \times (1/4) = 1/10$

So, the correct answer is A.

## Applying Counting Techniques

To apply counting techniques, we will use the fact that if we have an experiment where each outcome is equally likely to occur, then

$P(A) = [\# \text{ of outcomes where } A \text{ occurs}] / [\text{total } \# \text{ of outcomes}]$

So,  $P(M \text{ and } N \text{ both selected}) = [\# \text{ of outcomes where both are selected}] / [\text{total } \# \text{ of outcomes}]$

As I explained in my last post, it's always best to calculate the denominator first. So, for the denominator in our question, we need to determine the total number of outcomes when 2 people are selected from a group of 5 people. Since the order of the selected people does not matter in the given question, we can apply the combination formula. So, we can select 2 people from 5 people in  ${}_5C_2$  ways. When we apply the combination formula, we see that  ${}_5C_2 = 10$ .

At this point, we need to determine the number of outcomes where Marnie and Noomi are both selected. In other words, in how many ways can we select 2 people such that both of those people are Marnie and Noomi?

Well, there's only 1 way to do this; select both Marnie and Noomi.

So,  $P(M \text{ and } N \text{ both selected}) = 1/10$

Now, some readers may question whether or not there is only 1 way to select both Marnie and Noomi. This is a valid question. After all, we could select Marnie and then Noomi, or we could select Noomi and then Marnie. This would mean that there are 2 ways to select both Marnie and



Noomi. Seems reasonable enough. However, the important point to keep in mind is that, when we determined the value of the denominator, we assumed that the order in which the people are selected does not matter. So, when we determine the value of the numerator, we must once again assume the order in which the people are selected. This means that selecting Marnie and then Noomi is the same as selecting Noomi and then Marnie, in which case we cannot consider them as two different outcomes. So, there is only 1 way to select both Marnie and Noomi.

*Watch our lesson video “Intro to Probability”:*

<http://gre.magoosh.com/lessons/137-intro-to-probability/>

## Basic Concepts: Factorials

If you've ever come across a number with an exclamation mark after it, that's the factorial sign, e.g. 5!.

Factorials don't come up too often on the GRE, and when they do, it's usually on the more difficult problems. Still, you don't want to be faced with an exclamation sign next to a number and then exclaim yourself, "What in the world?!" (For the more expletive prone you can use your imagination!).

But no need to worry—just think of the factorial sign as a countdown. Whichever number is next to the factorial just count down to 1, multiplying each number together. So if you see 5!, all this means is  $5 \times 4 \times 3 \times 2 \times 1 = 120$ .

Factorials are sometimes seen explicitly (as in the problem below.) Oftentimes, you will need to use them when solving a difficult subset of math problems known as combination/permutations.

For now, try this problem:

Column A

$$7!$$

Column B

$$6! + 6! + 6! + 6! + 6! + 6! + 6!$$

- A. The quantity in Column A is greater
- B. The quantity in Column B is greater
- C. The two quantities are equal
- D. The relationship cannot be determined from the information given

You can work this out the long way:  $7! = 7 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1$ . Then you can do the same for column B, multiplying out and then adding the 6!s. Of course, if you catch yourself doing too much math always know there is a shorter way. In fact, quantitative comparison is testing your logical approach to a question, so do as little math as possible.

Here, we can see that column B is made up seven 6!, or  $7(6!)$ , which equals  $7 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1 = 7!$ . Therefore the two columns are equal, and the answer is C.

Watch our lesson video "Factorial Notation":

<http://gre.magoosh.com/lessons/130-factorial-notation/>

## Basic Concepts: Data Interpretation

Within the course of each Quantitative section, you will have, on average, two sets of Data Interpretation questions. Each set will present data in some form (graph, table, etc.), and you will have two or three consecutive questions on that same data set.

### Why does the GRE ask Data Interpretation questions?

Absolutely in the natural sciences, and to a great extent in the social sciences as well, data is king. All scientific authority rests on, or falters in the face of, good scientific data. If you are planning graduate studies in the natural or social sciences, I imagine it's neither a surprise nor a challenge that the GRE would ask this.

What about the poor crunchy artsy non-techy humanities majors? Yes, it is unfortunate that the general GRE is a one-test-fits-all kind of thing. I would say, though, whether you do science or not, and whatever opinions you may have about science and technology, we all live in a world in which we have been ineluctably affected by science and technology. To that extent, important parameters of our lives have been and will continue to be shaped by the data discovered by scientists. Any intelligent person should have at least basic competency in interpreting the data that can impact our lives. That's why the GRE asks about it.

### What are the types of GRE Data Interpretation questions?

Much of this question type is about your ability to read graphs & charts showing data, and really what the GRE is asking is for the most part quite straightforward. The vast majority of these questions revolve around one of the "big five" types of data display:

1. Pie Chart
2. Column Chart
3. Line Chart
4. Bar Chart
5. Numerical Table

Sometimes, the Data Interpretation set might combine two types — for example, a Pie Chart showing the general breakdown of governmental expenses, and then another chart or table of numbers showing the detail in one category. In rare circumstances, the Data Interpretation might be an entirely different kind of visual information, say, the floor plan of a house, but in those cases, the questions are often particularly simple.

## “Bar Charts” vs. “Column Charts”

ETS calls a chart a “bar chart” whether the bars are horizontal or vertical. Nevertheless, many sources (such as MGRE) call charts with the horizontal bars “bar charts” and charts with the vertical bars “column charts.” Regardless of the names we use, there is a subtle difference. In general, if the bars represent selected members of a particular category, with no attempt to exhaust the whole categories, and with no particular order among the members, they are represented as horizontal bars, what many folks would call a “bar chart.” For example, if the categories are seven different fruits, seven different makes of car, or seven different nations, those do not nearly exhaust those respective categories, and given the set of seven, there’s no inherent way to order them. (They probably would be listed simply in alphabetical order, for lack of a more meaningful ordering system.) Thus, they would be represented by horizontal bars.

If the categories either have an intrinsic order to them (e.g. various years) or if they represent the full complement of a category (e.g. the three divisions of a corporation), then they would tend to be represented with vertical bars, what many folks would call a “column chart.” Sometimes column charts are segmented (each bar broken into categories, and sometimes, they are equal height columns in which the segments represent percents.

Either variety can have side-by-side bars, if you are displaying two different measurements about each category.

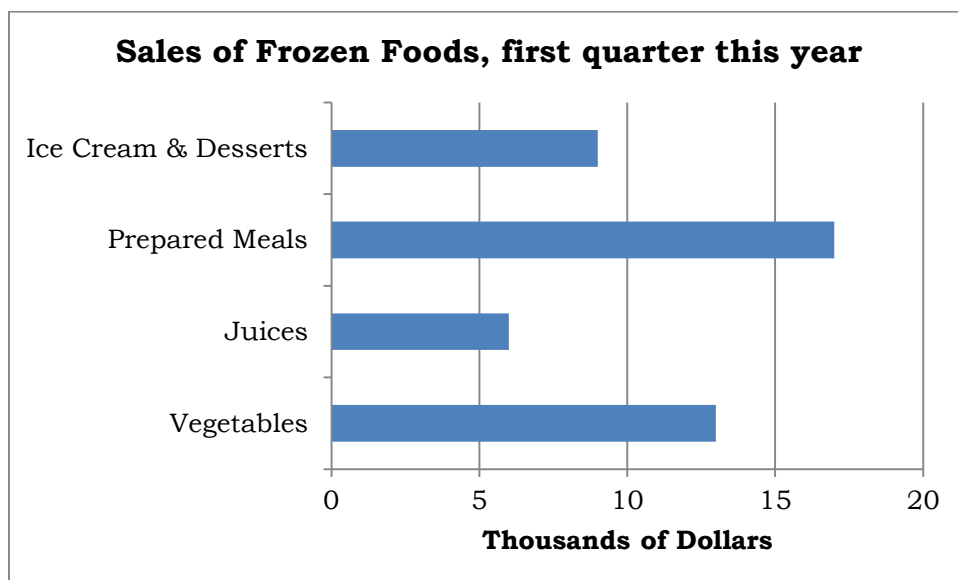
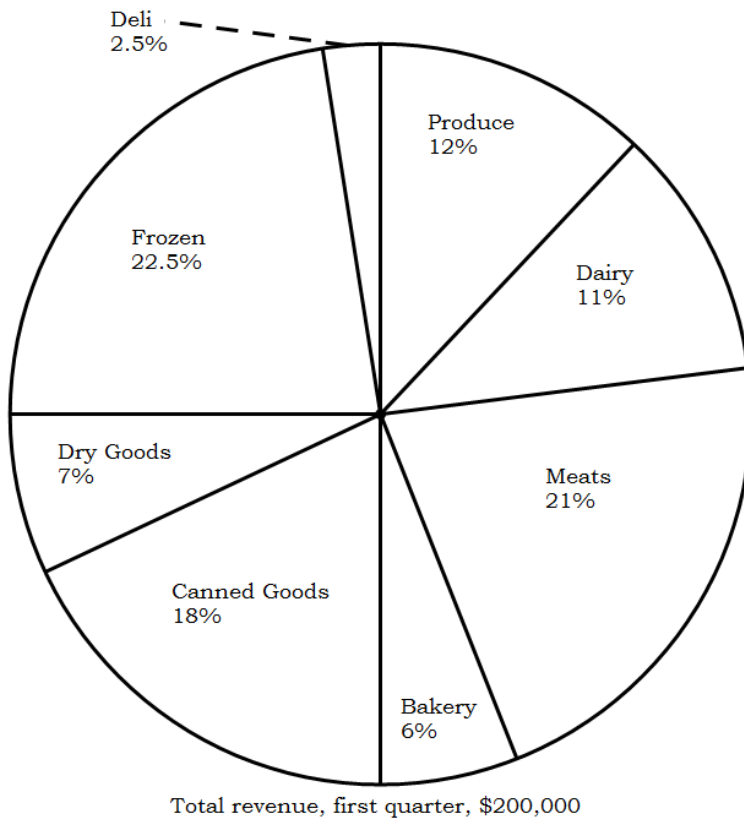
## How do I begin studying for GRE Data Interpretation?

Start looking for data displayed in graphs & charts. Any day’s issue of, say, the *New York Times* is likely to have at least one chart or graph accompanying an article somewhere. That’s even truer for any week’s issue of the *Economist*, arguably the single most intelligent weekly magazine in print. Why does a chart or graph accompany that article? What information is given in the chart that is not given in the article? What aspects of the data does the chart make clear? If you simply can understand what a graph or chart adds to a written article, you are more than well on your way toward mastering GRE Data Interpretation.

Below is a sample Data Interpretation for further practice. And, of course, sign up for Magoosh, where we will help you perform better on Data Interpretation and all other types of questions on the GRE.

## GRE Data Interpretation Practice Set

The following pie chart shows the breakdown of revenues for a particular grocery store over the first quarter of this year. The bar chart shows the detail of breakdown for frozen foods.



1. What is the dollar amount of sales of canned goods in the first quarter of this year?
  - A. \$6,000
  - B. \$9,000
  - C. \$18,000
  - D. \$36,000
  - E. \$90,000
  
2. Frozen prepared meals constitute what percentage of the total sales for the first quarter this year?
  - A. 2%
  - B. 9%
  - C. 20%
  - F. 36%
  - D. 54%
  
3. During the first quarter this year, this particular grocery store was finishing its construction of an expanded bakery facility, which, when opened at the beginning the second quarter, will offer dozens of new cakes and pies, a whole new line of pastries, and several flavors of gourmet coffee. Assume that in the second quarter, the bakery sales triple, and all other sales stay the same. The bakery would then account for what percentage of the total sales in the second quarter?
  - A. 8.7%
  - B. 12%
  - C. 16.1%
  - D. 18%
  - E. 25.3%

## Explanations

1. This is a straightforward read-data-off-the-chart question. The pie chart tells us canned goods sales constitute 18% of \$200,000. Don't go to the calculator for such a straightforward percent question!

$$.018 \times 200000 = 18/100 \times 200000 = 18 \times 2000 = \$36000$$

Answer = D

2. From the bar chart, prepared meals account for about \$18,000 in sales. This \$18,000 is what percent of \$200,000? Again, please don't jump to the calculator for this.

$$\text{percent} = \frac{\text{part}}{\text{whole}} \times 100\% = \frac{18,000}{200,000} \times 100\% = \frac{18}{200} \times 100\% = \frac{18}{2} \% = 9\%$$

3. This is a tricky question, because there's a tempting wrong answer. The bakery accounts for 6% of the total sales in first quarter, so if you triple that, it's 18%, right? Wrong! The new amount would be 18% of the total sales in the first quarter, but we want to know what percent would it be of the total sales in the second quarter? That's a new total because, even though everything else stayed the same, bakery sales increased.

We don't need to consider the actual numbers: we can just work with the percents. Bakery sales triple from 6% to 18% – that's the new "part." Since the bakery goes up 12% from 6% to 18%, and all other sales stay the same, the new total is 112% – that's the new "whole."

$$\text{percent} = \frac{\text{part}}{\text{whole}} \times 100\% = \frac{18}{112} \times 100\% = 16.0714\%$$

You can use the calculator if you like, although you could also approximate that the answer will not be 18% but rather something a little below 18%, because the "whole" has increased a bit. Either way, the answer = C.

## Practice Questions

### Multiple Choice

*Directions:* Choose the option that best answers the question.

How many positive integers less than 10,000 are such that the product of their digits is 210?

- A. 24
- B. 30
- C. 48
- D. 54
- E. 72

*Text Explanation:*

How many positive integers less than 10,000 are such that the product of their digits is 210?

(A) 24

$$210 = 2 \times 3 \times 5 \times 7$$

(B) 30

(C) 48

Case i: 4-digit number with 2, 3, 5, and 7

➡ 4! (24) possibilities

(D) 54

(E) 72

Case ii: 3-digit number with 5, 6, and 7

➡ 3! (6) possibilities

Case iii: 4-digit number with 1, 5, 6, and 7

➡ 4! (24) possibilities

$$\text{Total} = 24 + 6 + 24 = \underline{54}$$

Try this question online and watch the video explanation:

<http://gre.magoosh.com/questions/831/>



## Multiple Answer Questions

*Directions:* Consider each of the choices separately and select all that apply.

If  $x > 0$ , and two sides of a certain triangle have lengths  $2x+1$  and  $3x+4$  respectively, which of the following could be the length of the third side of the triangle?

Indicate all possible lengths.

- A.  $4x+5$
- B.  $x+2$
- C.  $6x+1$
- D.  $5x+6$
- E.  $2x+17$

*Text Explanation:*

If  $x > 0$ , and two sides of a certain triangle have lengths  $2x+1$  and  $3x+4$  respectively, which of the following could be the length of the third side of the triangle?

Indicate all possible lengths.

- ☒ A  $4x+5$
- ☐ B  $x+2$
- ☒ C  $6x+1$
- ☐ D  $5x+6$
- ☒ E  $2x+17$

Given 2 sides with lengths A and B,  
 difference between A and B < length of third side < sum of A and B

$$x+3 < \text{length of third side} < 5x+5$$

Try this question online and watch the video explanation:

<http://gre.magoosh.com/questions/2205/>

## Numeric Entry

Directions: Enter the answer in the blank.

If  $\left(\frac{2^{-n}}{3}\right)\left(\frac{3^{-n}}{2}\right) = \frac{1}{36}$ , what is the value of  $n$ ?

Text Explanation:

If  $\left(\frac{2^{-n}}{3}\right)\left(\frac{3^{-n}}{2}\right) = \frac{1}{36}$ , what is the value of  $n$ ?

1

$$\left(\frac{2^{-n}}{3}\right)\left(\frac{3^{-n}}{2}\right) = \frac{1}{36}$$

$$a^n b^n = (ab)^n$$



$$\frac{6^{-n}}{6} = \frac{1}{36}$$

$$\frac{6^{-n}}{6^1} = 6^{-2}$$

$$\frac{x^a}{x^b} = x^{a-b}$$

$$6^{-n-1} = 6^{-2}$$

$$-n-1 = -2$$

$$-n = -1$$

$$n = 1$$

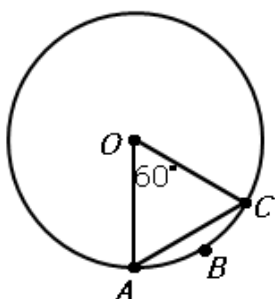
$$\text{If } x^a = x^b \text{ then } a = b \\ (x \neq 0, 1, -1)$$

Try this question online and watch the video explanation:

<http://gre.magoosh.com/questions/2185/>

## Quantitative Comparison

Directions: Choose the correct statement.



$O$  is the center of the circle with radius 6.

Column A

Length of arc  $ABC$

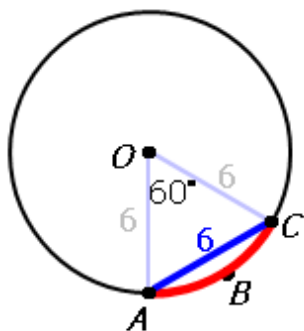
Column B

6

Choose the correct statement:

- A. The quantity in Column A is greater
- B. The quantity in Column B is greater
- C. The two quantities are equal
- D. The relationship cannot be determined from the information given

Text Explanation:



$O$  is the center of the circle with radius 6.

Column A

Length of  
arc  $ABC$  ✓

6+

**A**

Column B

6

Try this question online and watch the video explanation:

<http://gre.magoosh.com/questions/1054/>

# Verbal Section

## Question Types: Text Completions

On the surface the Text Completion sounds deceptively easy: all you have to do is fill in in blanks in a sentence with a vocabulary word that, given the clues in the sentence(s), fits best. Notice the (s) in the preceding sentence—unlike the one-sentence Sentence Completions on the old GRE, a Text Completion can contain anywhere from one to four sentences. Indeed, the longest Text Completion can sometimes run an entire paragraph.

A Text Completion can have anywhere from one to three blanks. Every one-blank Text Completion will be one sentence and will contain FIVE answer choices. The two- and three-blank Text Completions, on the other hand, can run anywhere from one to four sentences. Most importantly, each blank in a two- and three-blank Text Completion will always have THREE answer choices.

With a two- or three-blank text completions, your chances of guessing and getting lucky are quite low: for a three-blank TC, you have to get all three correct in order to get the question correct (that amounts to a 1 in 27 chance in guessing).

Below are five important strategies you should follow if you want to do well on Text Completions:

### 1. Don't dive in

Read the entire stem first. The reason for this strategy is that the first blank is often ambiguous, unless you have read the entire paragraph.

### 2. Breaking down the text completion

Text Completions are sometimes a paragraph long, so it is easy to get lost in them. A great strategy is trying to understand the “big picture”. Breaking down the paragraph in your own words (paraphrasing the paragraph) will help you get a grasp on what the sentences are talking about. Then you're ready for step #3.

### 3. Use your own words

We want to use the strategy of putting in our own word(s) in the blank or blanks. To do so, you must always justify your answers based not just on the “big picture”, but on some of the specific words or phrases in the sentence itself. I refer to these word(s) as keywords.

### 4. The second (or third) blank first

Because the first blank is often difficult to deal with, try finding a word for the second or third blank first. Then work your way backwards to the first blank. The caveat: This

technique only applies if you can come up with a word for the second or third blank. If you can't, then work with the first blank.

### 5. Use the entire text completion as context

When you've finally chosen your two/three answers, plug them back into the blanks. Does the completed sentence make sense with how you earlier paraphrased it?

Watch our lesson video "Intro to Text Completion":

<http://gre.magoosh.com/lessons/149-intro-to-text-completion/>

## Question Types: Sentence Equivalence

Sentence Equivalence questions have vague instructions (“select exactly two words that best complete the sentence and produce sentences that are alike in meaning”). Even though the Revised GRE has been around for almost two years, many are still scratching their heads, wondering what the difference is between synonymous sentences and synonyms.

Even if a Sentence Equivalence question is straightforward, you may be unsure how to proceed. What if three answer choices work? Two of them are synonyms, and one of them isn't. You feel, however, that one of the synonyms somewhat works in the sentence, but the one lone word that does not have a synonym amongst the answer choices works even better. What, then, is the answer?

Let's take a look at the question that puts us in the aforementioned quandary.

The blitzkrieg of anti-smoking images has clearly had a(n) — effect: both the number of total smokers and the rate of lung cancer has fallen in recent years.

- A. salutary
- B. lasting
- C. dramatic
- D. ephemeral
- E. unremarkable
- F. beneficial

There are a few answer choices that could conceivably work here: (A) salutary, (B) lasting, (C) dramatic and (F) beneficial. However, lasting is a bit suspect, because there is nothing in the sentence implies that the changes in behavior are permanent.

So, now you are down to three answers. Let's say you really like answer choice (C) dramatic. Indeed, this is the very word you came up with for the blank. However, because answer choices (A) and (F) are synonyms that work for the blank, there is no way (C) dramatic can be the answer. This is an important statement, so I will repeat it again: if two synonyms work for the blank, then another word cannot be the answer.

Of course, in the world of the GRE, and Sentence Equivalence in particular, it is not always that straightforward. What if you did not know the definition of (A) salutary? Then would it make sense to choose (C)? No. The overwhelming majority of Sentence Equivalence answers are synonyms. Even in those Sentence Equivalence questions, in which the two correct answers aren't strict, synonymous sentences result when you plug the words in. (C) dramatic and (D) beneficial, however, are very different words and create very different sentences. Therefore, your best bet, probability-wise, is to choose (A) salutary, even though you do not know what it means. The

assumption here is that (A) salutary is one of the two synonyms. Then you want to choose either dramatic or beneficial. One of them will most likely be the answer.

You may balk, thinking that the odds are 50/50. However, if you simply pick (C) and (F), while avoiding the word you do not know, your chances of answering the question correctly are very slim to nothing because such different words clearly create different sentences.

Here are some good strategies for dealing with Sentence Equivalence questions:

- Always look for synonyms.
- If you can't find any synonyms amongst the answer choices, given you know the definition of every word, then the correct answers will be words that aren't technically synonyms.
- If you do not know a few of the words, do not just pick two words because they create synonymous sentences; sometimes two pairs of synonyms exist amongst the six answer choices.
- Choose a word you do not know, and match it with one of the answer choices that work.
- If the above sounds like a gamble, that's because approaching Sentence Equivalence, in terms of guessing, is so complex, at least compared to the typical one in five answer choices. Essentially, you will want to do anything to increase the odds of guessing correctly. And, to do so, the steps above will be your most helpful strategy.

Watch our lesson video "Intro to Sentence Equivalence":

<http://gre.magoosh.com/lessons/180-intro-to-sentence-equivalence/>

## Question Types: Reading Comprehension

Typically when I have a student who is struggling with Reading Comprehension, I have them do a little exercise. I give them two minutes to read an entire passage (yes, you should always read the passage first before attempting the questions).

### Know the passage

When the two minutes are up, I immediately have them close the book and tell me what the passage was about. Say the passage was about three competing theories on dinosaur extinction. The author endorsed a meteorite impact theory because it could account for the uneven dispersal of iridium.

A student struggling with the passage will say the passage was about dinosaurs. They may throw in the word meteorite, or maybe mention something about iridium, but they will not give me with a coherent synopsis, like the one I provided above, because their understanding is fragmented.

You may think trying to describe the passage in your own words is frivolous and time-consuming. However, unless you try to understand the passage by describing it in your own words, you will find yourself struggling even more on the questions, easy prey for the traps the test writers have laid.

### Slow down

So what should you do? Learn to read passages, slowly even, to make sure you can accurately paraphrase what the passage is talking about. In fact, you shouldn't even worry about the questions until you are able to understand how the passage is constructed.

### Don't trust your gut

Many students balk, saying that slowing down to read the whole passage eats up time. The truth is students waste the most time on questions they don't know the answers to because they have an incomplete understanding of the passage. They will vacillate between two answer choices and pick one based not on logic but on "gut feeling".

### Takeaway

So the key is to really understand the passage. One way to make sure you are doing so is to write down the three main points after you're done reading the passage. Once you get in the habit of doing so, processing the passage in this way will become second nature and soon you will be able to dissect the passage in your head without having to write anything down.





Watch our lesson video “Deconstructing Passages - I”:

<http://gre.magoosh.com/lessons/187-deconstructing-passages-i/>

## Question Types: Argument Questions (Paragraph Argument)

On the GRE, a subset of the Reading Comprehension is called Paragraph Argument. Of course, the GRE doesn't call it this, but instead lumps the question type under Reading Comprehension. Back before the old GRE was the old GRE, and when it was actually the new GRE, ETS had decided to do away with a section called the Analytical Section. So, the old-old GRE had an extra section worth a total of 800 points (yes, you can consider yourself lucky, in a way, that the new GRE didn't completely resurrect this section).

They did, however, resurrect a question type from this erstwhile section - and that is the question type I am labeling a Paragraph Argument question.

Those with GMAT experience will notice that this question type is the same in content and description as the Critical Reasoning questions on the GMAT.

Even for those of you with only GRE experience, you've seen it before - it's a short paragraph with only one question, typically asking you to think logically about information in the paragraph.

Today, I am going to be dealing with a subspecies of this question that is proving pesky for many students (and for those of you considering only taking the GMAT, you better listen up).

You can identify this question by bolded parts of the text. It is called Paragraph Argument, and requires you to understand how arguments are constructed.

Below we have an excerpt:

*The lower the tide, the less likely guppy fish are to come to the surface to feed. The tern, which feeds exclusively on the guppy, does most of its hunting in the evening, when the tide is low. It follows that the tern is going to have more difficulty hunting the guppy in the evening than during the daytime, because it expends more energy doing so. Dotting points slightly out to sea are outcrops of rock that the tern usually lands on while hunting. Therefore, an observer is more likely to see tern resting on the rocks in the evening than during the day.*

A Paragraph Argument question will have you do one of a number of things: Evaluate the Argument, Strengthen/Weaken Argument, Resolve the Paradox. Following each Paragraph Argument are five answer choices.

For this excerpt, we are not going to answer a question, but are going to take apart the argument. This skill is essential to answer any of the question types above.

## Premise

For an argument to be valid, it must be based on a fact. In this case, we accept what the passage tells us in the beginning two sentences (by the way, I made up these fish facts, so I do not think they actually apply to the natural world). For me to draw a valid conclusion, I must build off of these sentences.

## Conclusion

In this case, I am assuming that the tern is going to have trouble hunting the guppy in the evening, because there aren't too many guppies breaking the surface. This conclusion is by no means 100% valid. It is a conclusion drawn from facts that we, the readers, take for granted are 100% valid (the first two sentences).

With this excerpt, we are not finished. Notice how there is another conclusion: "Therefore, an observer..." You'll notice that this sentence is the final conclusion, which must be based on the first conclusion. Therefore, the first conclusion is not the main conclusion, but what is known as the intermediate conclusion. Without the intermediate conclusion, the passage would not be able to draw the main conclusion.

## Other twists

Sometimes, the main argument will not agree with the intermediate conclusion. For instance, the main argument could have said something to the effect of, "Therefore, the increase of birds on the outcrops during the day cannot fully be explained given the above information."

In this case, the main argument opposes the intermediate conclusion. That is, there has to some other reason, besides resting, to account for the increase in terns. Perhaps the terns used the time on the outcrops to clean their feathers (or some other random explanation).

Lastly, not all Paragraph Arguments - in fact, very few indeed - actually deal explicitly with intermediate conclusions. But, because this terminology is not common, it tends to throw many people off. However, if you want more practice with Paragraph Arguments, you should not only look at Revised GRE material, but should also look at GMAT and LSAT material. There will be plenty of practice there for this tricky kind of question.

## Pacing Strategies

Each verbal section consists of 20 questions. You will have a total of 30 minutes per verbal section, translating to 1.5 minutes per question.

So how do you allocate this time amongst the different questions? In order of LEAST time-consuming to MOST time-consuming we have:

1. One-Blank Text Completions
2. Sentence Equivalence
3. Two-Blank Text Completion
4. Short Reading Passage
5. Three-Blank Text Completion
6. Paragraph Argument
7. Long Reading Passage

This ranking is a rough estimate, meaning that a difficult sentence equivalence question may cost you more time than a straightforward three-blanker. To simplify things even further, I will assign each of the sections above a different amount of time, giving a range to account for the difference in time for any given question type.

- One-Blank Text Completions 20 - 45 seconds
- Sentence Equivalence 20 - 60
- Two-Blank 30 - 75 sec
- Three-Blank 45 sec - 2 min
- Short Reading Passage (including time to read passage): 45 sec - 1:45
- Paragraph Argument - 1:00 - 2:15
- Long Reading Passage 1:00 - 3:00.

What does this all mean? On Sentence Equivalence and One-Blank Text Completions spend no more than a minute. On Two-Blank and Three Blank Text Completions spend an average of 1:00 - 1:30 minutes. The extra time you saved in One-Blank Text Completions and Sentence Equivalence use towards Reading Comprehension.

### The low-hanging fruit

20 seconds to 3:00 minutes is a pretty vast range. Simply put, some questions are easy and others fiendishly diabolical. The shocking thing is each question, from the one that you get in a blink of an eye to one that has you scratching your head till longer after the exam is over, are worth the same.

That point is so important I am going to repeat it again (in caps): EACH QUESTION ON THE GRE IS GIVEN THE SAME WEIGHT.

The takeaway? Do not spend 3 minutes agonizing over a three-blank text completion with the words *hagiographic* and *pulchritudinous* as answer choices. If it's a long paragraph with really difficult words SKIP IT!

That is, as soon as you see that the question is difficult, move on. Instead, go for the low hanging fruit. That is, first answer the questions that are easier and take less time. The Revised GRE, after all, allows you to scroll from question to question. Make sure to take advantage of this function.

### **You do not need to attempt every question**

Don't freak out if you are unable to attempt every question. As long as you just guess some random answer, that's fine. There is no penalty for guessing. There is, however, a penalty for rushing through a relatively easy question to try to answer every question. And that penalty is you getting the easy question wrong. Anyways, you do not get bonus points for completing the test. So make sure to be accurate.

### **Takeaway**

Each question on the GRE is worth the same. Do not waste time trying to answer a difficult question. Remember you can always come back to a difficult question if you have time, after you've answered the easy/medium ones.

## Vocabulary: Learning in Context

When learning GRE vocabulary, we need to arm ourselves with as many approaches as possible.

### Reading for vocabulary

Why is reading for vocab, compared to the memorizing flashcards, so effective?

In the cozy flashcard milieu, words come to us a lot easier. But, the GRE is far from cozy. When we see a word we've seen before, the context — the GRE testing room — is very different. Likewise, when we are reading, we don't expect to see a given word. It is this element of surprise, this jolt of recognition that makes reading such an effective vocabulary-learning tool.

If you are going to use flashcards, we recommend using one that have good example sentences. We have over 1000 free ones for you to flip through online (or on your phone!) here:

<http://gre.magoosh.com/flashcards>

### Active word usage

Once you've exposed yourself to many new words through reading, you don't want to just look at them and put them in a notebook for safe keeping. A technique you can rely on is active usage - a highly effective way of embedding words into long-term memory. If you don't make active usage part of your arsenal, you are selling yourself short.

The key to active usage is to be creative. So, if vocabulary words start randomly popping into your head, think of where you can use them. For instance, if you someone walking down the street arguing on his cell phone, words such as *contentious*, *disputatious*, and *polemical* should leap to mind. Indeed, the zanier the connections you make with words, the more likely you are to remember them (this zanier-is-better approach applies to the next part of the vocabulary arsenal as well).

### Mnemonics

Suppose there is a really pesky word that you just can't get into your long-term memory, no matter how many times you see that word. Okay, perhaps you don't have to suppose, as there are many words that fall into this category. But let's pluck a word at random from the GRE vocabulary tree: lambaste.

Let's say whenever you encounter this word, the first four letters, l-a-m-b, throw you off. You picture a docile creature bah-ing contentedly in a pen. When you see the definition — to reprimand harshly — it always surprises you.

Instead of trying to snuff out the image of a lamb, however, you should try using it to your advantage.

Imagine a boss, or anybody who has exerted some power over you in the past (a middle school gym teacher works perfectly). He or she calls you into their office (or lair) and is now berating you for something you did incorrectly. Now, I want you to imagine a large lamb's head in place of this person's head.

Or, if that doesn't quite do the trick, imagine you are cooking. You're not very adept in the kitchen, but you want to surprise your significant other with his/her favorite dish. Well, in the end, you end up ruining the lamb. Your significant other arrives and, witnessing your culinary debacle, gives you a good going over, "you don't baste a lamb, you roast one."

The process of coming up with a creative—and often offbeat—way of remembering a word is called a mnemonic. Above are two mnemonics that I thought of on the spot. What I've learned from coming up with mnemonics in front of a class is that the best mnemonics are our own mnemonics. Sure, a few students like my mnemonics, but others devise their own wacky ones up (or lean back slightly, looking at me as though I've gone a little mental).

As silly as my mnemonics may sound, the main takeaway is that a good mnemonic is the one that works for you. And by good, I mean it is memorable. Case in point, you may have already forgotten my lambaste mnemonics, because you didn't think of them yourself. But, if you are struggling with a vocab word, a clever mnemonic will not only make the word easier to learn but will also — hopefully — make the word more fun to learn.

## Vocabulary: Magazines and Newspapers

The Revised GRE requires us to have a far greater sense of how words function in context. This is why I've recommend learning vocabulary by reading voraciously from prescribed sources. These sources include *The New York Times*, *The Economist*, *The Atlantic Monthly*, and *The New Yorker*. Most of the writing found within the pages of these august publications is not only replete with GRE-level vocabulary but is also similar in tone and style to that found on the Revised GRE.

Today I am going to take actual articles from the aforementioned sources. I will highlight important vocabulary and also discuss ways you should approach learning words when you encounter them in context.

Finally, the articles come from a wide variety of fields, e.g. business, science, literature, etc. I've done my best to select pieces that I think a majority will find interesting, a criteria that I recommend you employ when you embark on your own reading quest.

In each case, I've specifically taken excerpts that contain not only GRE words (though these are sprinkled throughout each article) but also engage in analysis of some issue.

### The Atlantic Monthly

*Outsider, non-founder CEOs are often overvalued because many corporate boards think the answer to their problems is a superstar CEO with an outsized reputation. This leads them to overpay for people who are good at creating outsized reputations through networking, interviewing, and taking credit for other peoples' achievements-all bad indicators of future success.*

*Rakesh Khurana has amply shown how this delusion of the charismatic savior creates a dysfunctional market for CEOs, allowing the small number of existing public-company CEOs to demand and receive extravagant compensation. The myth of the generalist CEO is bolstered by the many fawning media portrayals where CEOs say that their key jobs are understanding, hiring, and motivating people-leading board members to believe that you can run a technology company without knowing anything about technology.*

This passage is great because it is full of relatively difficult words, many of which are high-frequency GRE vocabulary (*fawning*, *bolstered*, *ample/amply*). This excerpt is also filled with analysis, which will help sync your synapses for the Revised GRE.

Perhaps business reading induces a *meh*, or worse yet a *blah*. Maybe you simply want to vary up your reading. A great field to draw from is science. Part of the reason is the Revised GRE will typically have one science passage. While it may be drier than the typical fare found in the



magazines cited above, often the science writing on the GRE is similar in tone and style to what you'll encounter in these magazines.

So let's take the article *Bird Brain*, which appeared in *The New Yorker* last year. It explores the development of language in human beings and whether language is the province only of humans. To do so, it tells the story of an African gray parrot, Alex, and his owner, Irene Pepperberg—namely how she trained Alex to say hundreds of words (though none, I believe, were GRE vocab) so that Alex, by the time he was an adult, was able to form relatively coherent sentences.

## The New Yorker

Below is an excerpt from the article, which is about 15-pages long. In general I would recommend the entire piece, especially if the above sounds intriguing. The excerpt includes a few vocab words, and some reflection and analysis.

*All children grow up in a world of talking animals. If they don't come to know them through fairy tales, Disney movies, or the Narnia books, they discover them some other way. A child will grant the gift of speech to the family dog, or to the stray cat that shows up at the door. At first, it's a solipsistic fantasy—the secret sharer you can tell your troubles to, or that only you understand. Later, it's rooted in a more philosophical curiosity, the longing to experience the ineffable interiority of some very different being. My eight-year-old daughter says that she wishes the horses she rides could talk, just so she could ask them what it feels like to be a horse. Such a desire presumes—as Thomas Nagel put it in his 1974 essay “What Is It Like to Be a Bat?”—that animals have some kind of subjectivity, and that it might somehow be plumbed. In any case, Nagel explained, humans are “restricted to the resources” of our own minds, and since “those resources are inadequate to the task,” we cannot really imagine what it is like to be a bat, only, at best, what it is like to behave like one—to fly around in the dark, gobble up insects, and so on. That inability, however, should not lead us to dismiss the idea that animals “have experiences fully comparable in richness of detail to our own.” We simply can't know. Yet many of us would be glad for even a few glimpses inside an animal's mind. And some people, like Irene Pepperberg, have dedicated their lives to documenting those glimpses.*

Though you may already know a few of these words, you should definitely look them up, especially if you are inferring the meaning based on the context. Always validate your hunch, don't assume you can always glean the exact definition of the word simply by looking at context.

After looking up these words, you'll notice a word with a secondary meaning, *plumbed*, and a couple of words from philosophy - *subjectivity* and *solipsistic*. After consulting *Word Smart*, [the Magoosh flashcards](#) or other vocabulary lists I've recommend you'll notice that subjectivity (or subjective) is a very important word; solipsistic, on the other hand, is not as likely to pop up on the

test. But if you already have a strong vocabulary, and are looking to score in the top 10%, then definitely learn solipsistic.

You will notice that the definition of *interiority* isn't very surprising, as it is directly related to interior. You may also notice that it is similar to *subjective*. Finally, you learn the word *ineffable*, which say you've never seen before, and you also find it on a few lists. Write it down on a flashcard along with an example sentence (oh, the irony of ineffable - for to say something is *ineffable* is contradicting the very essence of the word).

Following a process similar to the one above is important. You don't want to simply underline the words and look them up. You want to digest them, so that, much like Alex the parrot, you will be able to use them in a coherent sentence.

Of course reading the entire article is also a good idea. Essentially you are training your brain to read through a long, relatively challenging piece, a skill that is indispensable during the third hour of the Revised GRE.

## New York Times Book Review

Let's say that you read *Bird Brain* and enjoy it. You are already familiar with a number of words and want something more challenging, maybe something couched in academic jargon or that oozes literary style. (I'm assuming that if you fall into this category, you are also looking to get the difficult verbal section).

A good resource is the *New York Times Book Review*. Here you will find the truly erudite waxing literary on a recently published novel/book that is just as scholarly as the review. You may even ask yourself if *The New York Times* writers are the very writers who craft byzantine Text Completions for ETS.

Below are two excerpts from the same book review of a biography of Joseph Heller, the reclusive, and frequently irascible, author of Catch-22, one of the great novels of the 20<sup>th</sup> century.

*But again, Daugherty is often perceptive about Heller's place in the larger culture, even if the novelist himself rarely comes into focus. For the human aspect, one turns to Erica Heller's frank but loving memoir of her father, "Yossarian Slept Here," which comes as close as possible, I dare say, to deciphering the **enigma** behind the obsessive, pitch-black fiction. Joseph Heller, the opposite of **demonstrative**, was given to **oblique** ways of showing affection...*

*That was the year Heller published his second novel, "Something Happened," which Daugherty commends as follows: "Joe stepped beyond Wilson's sentimentality and Yates's*

bitterness to **eviscerate** modern America's success ethic." Such a **pat** comparison to Sloan Wilson, the author of "The Man in the Gray Flannel Suit," and Richard Yates, the author of "Revolutionary Road," is the sort of thing Daugherty might have **emended** given a bit more time to think about it; at any rate, "Something Happened" is perhaps the one work of postwar American fiction that makes Yates seem positively **Panglossian**. Erica Heller, for her part, describes the novel (probably her father's best) as "569 pages of hilarious but **mordant**, **caustically** wrapped, **smoldering** rage" — though of course it's personal in her case. Primary among the targets of the protagonist Bob Slocum's paranoid, **solipsistic** rant is his family...

This article is clearly the most challenging of all the ones printed in this post. There are many difficult words, some that may give even the literate amongst us pause (**Panglossian** is derived from a character in Voltaire's *Candide*, Dr. Pangloss. The doctor was always optimistic, regardless of the circumstances).

Interestingly, **solipsistic** makes another appearance (maybe it's not such an arcane word after all!). Higher-frequency words—GRE-wise—include **mordant**, **caustic**, **emend**, **enigma**, and **oblique**.

Also, you want to be careful not to rely too much on assumptions. **Demonstrative** does not simply mean to demonstrate (it means tend to expression one's emotions outwardly). And **pat**, such a diminutive word, so folksy-sounding and innocuous, has many meanings. The adjective form, which is employed in the book review, could easily pop up on the GRE, and cause you to answer a Text Completion incorrectly. So be sure to look up such word (if an explanation is **pat** it is superficial/cursory and unconvincing).

Surprisingly, difficult vocabulary words and highfalutin prose aren't only found in the esoteric niche of the book review. Let's take an opinion piece we are far more likely to read: the movie review.

## The New York Times

At a certain point, though — to say exactly when would ruin a fairly stunning surprise — the cat-and-mouse psychology is **jettisoned** in favor of something more **procedural**. The two halves of "Love Crime" divide according to the words of the title: the first explores the **knotty**, **feverish**, **ambiguous** bond between Christine and Isabelle, while the second is all about guilt, innocence, evidence and motive. It is interesting and **ingenious**, even if some of the **kinky**, **queasy** fascination that had been so intoxicating in the earlier scenes **ebbs** away.

While the words here aren't as recondite as **Panglossian**, the prose style is relatively challenging and echoes that of the GRE Text Completion. In fact, this article is at a perfect reading level for those aiming to score between 150 and 160 on the Verbal section.

## Practice Questions

### Text Completion

*Directions: For each blank select one word from each column that best completes the sentence.*

The movie is comprised of several vignettes, each presenting a character along with his or her foil: a staid accountant shares an apartment with a (i)\_\_\_\_\_ musician; a tight-lipped divorcee on a cross-country roadtrip picks up a (ii)\_\_\_\_\_ hitchhiker; and finally, and perhaps most unconvincingly, an introverted mathematician falls in love with a (iii)\_\_\_\_\_ arriviste.

Blank (i)

A. colorful

B. insatiable

C. eminent

Blank (ii)

D. garrulous

E. untrustworthy

F. forlorn

Blank (iii)

G. unpredictable

H. gregarious

I. bumbling

Answers: A, D, H

'Foil' is an opposite. Therefore each time a person is mentioned we want to come up with a person who exhibits opposite qualities. For instance, in the first blank we have 'staid accountant.' 'Staid' is boring and dull. Thus, the opposite would be (A) colorful. For the second blank, (D) garrulous is the opposite of 'tight-lipped.' Finally, (H) gregarious is the opposite of 'introverted.'

*Try this question online and watch the video explanation:*

<http://gre.magoosh.com/questions/2574/>

## Sentence Equivalence

**Directions:** Select exactly two words that best complete the sentence and produce sentences that are alike in meaning.

A knack for \_\_\_\_\_, it can be argued, allows one access to a whole range of careers, many of which require one to forsake direct, honest speech.

- A. eloquence
- B. prevarication
- C. equivocation
- D. abbreviation
- E. discernment
- F. openness

**Answers:** B, C

'...to forsake...speech' means to not speak truthfully. Thus the word in the blank should be a synonym with dishonest

- A. eloquence has a positive connotation
- B. prevarication is speaking in an evasive fashion
- C. equivocation means to speak vaguely as to avoid revealing the truth
- D. abbreviation is not supported by context
- E. discernment is the ability to judge
- F. openness is the opposite of the blank

*Try this question online and watch the video explanation:*

<http://gre.magoosh.com/questions/2369/>

## Reading Comprehension

*Directions:* Consider each of the choices separately and select all that apply.

What little scholarship has existed on Ernest Hemingway--considering his stature--has focused on trying to unmask the man behind the bravura. Ultimately, most of these works have done little more than to show that Hemingway the myth and Hemingway the man were not too dissimilar (Hemingway lived to hunt big game so should we be surprised at his virility, not to mention that of many of the author's--chiefly male--protagonists?). In the last few years, several biographies have reversed this trend, focusing on Hemingway near the end of his life: isolated and paranoid, the author imagined the government was chasing him (he was not completely wrong on this account). Ironically, the hunter had become the hunted, and in that sense, these latest biographers have provided--perhaps unwittingly--the most human portrait of the writer yet.

With which of the following would the author of the passage agree?

- A. The prevalence of scholarship on Hemingway is commensurate with his renown as a writer.
- B. The latest Hemingway biographies consciously intended to show Hemingway's vulnerabilities.
- C. Until recently, Hemingway biographies had shown a similar trend.

*Answers: C only*

(A) is wrong because the first sentence clearly states the opposite: for someone of Hemingway's stature, few biographies have resulted.

(B) is wrong because the passage says, "perhaps unwittingly", meaning the biographies did not consciously set out to depict Hemingway's vulnerabilities.

(C) is clearly supported in the passage: "What little scholarship...bravura."

*Try this question online and watch the video explanation:*

<http://gre.magoosh.com/questions/2663/>

## Paragraph Arguments (Critical Reasoning)

*Directions:* Choose the option that best answers the question.

The waters off the coast of Iceland are filled with pods of killer whales, which migrate there during the summer. Wildlife parks that rely on the killer whales for entertainment hunt the killer whale almost exclusively in the water of Iceland, because strict sanctions forbid them from doing so off the coast of North America, an area also abundant in killer whales. Since Iceland recently gave into pressure from international groups opposed to the hunting of killer whales, it too will forbid the hunting of killer whales off its coast. Therefore, all wildlife parks will be forced to end their shows featuring killer whales once their current killer whales are unable to perform.

All of the following cast doubt on the conclusion of the argument EXCEPT?

- A. The recent ban only extends to within one hundred miles of Iceland, though killer whales are plentiful along the shores of Greenland, which fall outside this range.
- B. The incoming prime minister of Canada, who is more conservative, is planning on lifting the ban on hunting killer whales off the coast of Canada.
- C. In-park killer whale births have become increasingly common, especially in those wildlife parks that harbor a large number of killer whales.
- D. Some wildlife parks are involved in the illegal trade of killer whales.
- E. It is nearly impossible to catch killer whales in deep waters, so hunters typically rely on luring killer whales into coves.

*Answer: E*

The argument states that the only place wildlife parks can find killer whales is off the coast of Iceland, yet, with an imminent ban there, wildlife parks will be unable to replenish their respective in-park killer whale populations. Eliminate all the answer choices that call this question into conclusion.

(A) provides a source of killer whales (Greenland), thereby weakening the conclusion.

The argument states that North America is also abundant in killer whale. If Canada lifts its ban, then wildlife park can find killer whale there. (B) is out.

(C) provides a great place to replenish the killer whale population: the park itself. Therefore, (C) directly attacks the argument that wildlife parks will run out of killer whale.

(D) provides a clear means by which parks will acquire killer whales despite all the bans.

(E) does not provide a new means by which parks will acquire new killer whales. It only describes how killer whales are generally caught. Therefore (E) is the answer.

*Try this question online and watch the video explanation:*

<http://gre.magoosh.com/questions/3403/>



# Analytical Writing Assessment

## Meet the AWA

Many people give the AWA short shrift - after all, it is not included in the 260 - 340 score range. However, a very low writing score could hurt your chances of getting accepted to many graduate programs. So, it is important, even if you have to take a little time out from your busy GRE prep schedule, to practice.

## Just enough?

The AWA is scored on a scale from 0.0 to 6.0, in 0.5 increments. While very few people are able to get a perfect 6, most graduate programs aren't too concerned about your score, as long as you are able to get a 4.0 and above. Of course, you know best whether your graduate program falls into that range. Are you looking to go to journalism school? Well, then anything less than a 5.0 is problematic. Looking to do computer science or engineering? For most programs, a 4.0 should be sufficient.

A 4.0 translates to roughly the 50% mark. Basically, you are able to write two essays, 30-minutes each, better than half of the essay applicants. To get to this level should be your goal. If your program requires at least a 4.5, which some do, you will then be only 0.5 off.

## Two essays?

Yes, the AWA is not just one long, taxing essay but two, relatively long, taxing essays. For the first essay, you will have to take a side on a complex issue and craft a 4 - 6 paragraph essay, offering supporting examples and logic to support your position. This is the Issue statement, and, for most, is usually the more difficult of the two essays.

The next essay is called the Argument. Instead of having to argue your own position, the way you must do on the Issue task, you must criticize someone else's argument. This someone else happens to be the GRE test-writers. But don't worry - they are not going to ask you to challenge an essay written on Marxist theory. The arguments are always based on real-world, straightforward examples. Better yet, the arguments are usually filled with gaping logical holes that make it relatively easy for you to take apart the argument (don't worry, the logical skills you employ on the critical reasoning questions in the Verbal section are far more nuanced).

So what does it take to get a 4.0? Well, for both the Issue and the Argument task, you will want to write an essay that is each of the following:

**Well-structured:** The essay should have an Intro, Body Paragraphs and Conclusion. Your intro should end with a clearly defined thesis, so the person reading your essay knows what you are trying to prove.

**Well-reasoned:** For the Issue paragraphs, your body paragraphs should contain examples, either actual or hypothetical, that cogently defend your position. For the Argument task, you convincingly show why the argument is weak.

**Well-Expressed:** The GRE wants to get a sense of how well you write. And by write, I mean, do you use relatively sophisticated speech? Do you vary up your sentences? Do grammar issues interfere with your expression?

Together, the three points will give the GRE reader an overall impression (what they call a holistic approach) of your writing ability. Again, this score will be based on a scale from 0.0 - 6.0.

## Takeaway

So, those were the high-level basics. But don't worry - there is a lot more to come. We are going to take a look at the Issue and Argument independently.

## The Argument Essay

Just like the assumptions themselves, the trepidation people have of The Argument Task on the Analytical Writing Assessment Section of the GRE is unwarranted. Below is a sample argument prompt and the first step in approaching the Argument Task: Brainstorm.

### Sample task

SuperCorp recently moved its headquarters to Corporateville. The recent surge in the number of homeowners in Corporateville proves that Corporateville is a superior place to live than Middlesburg, the home of SuperCorp's previous headquarters. Moreover, Middleburg is a predominately urban area and according to an employee survey, SuperCorp has determined that its workers prefer to live in an area that is not urban. Finally, Corporateville has lower taxes than Middlesburg, making it not only a safer place to work but also a cheaper one. Therefore, SuperCorp clearly made the best decision.

"Write a response in which you examine the stated and/or unstated assumptions of the argument. Be sure to explain how the argument depends on the assumptions and what the implications are if the assumptions prove unwarranted." - ETS

### Step one - attack the assumptions

Do not agree with any part of the argument—the argument is full of logical gaps and your job is to expose them. Of course, you do not only want to cite what is wrong with the argument, you want to elaborate on how the argument can be improved.

The first step is to brainstorm the logical gaps or unwarranted assumptions the argument makes. Thinking of the assumptions is key before writing - don't just rush into the essay. Planning before you write will, in the end, save you time.

In this post we will only be concerned with the brainstorming part. The follow up post will have a sample essay, followed by a score and feedback, including how to improve the essay.

#### *Assumption #1*

The argument assumes that the increase in homeowners is directly correlated with improved living, or, as the argument states, "a superior place to live." Housing could simply be cheaper, causing an influx of people. That is the increase of population does not mean that everybody wants to live in Corporateville because it is such a great place.

### *Assumption #2*

Even if everybody wants to move to Corporateville because it is a superior place to live, that doesn't mean what is "superior" for residents is "superior" for a corporation. Remember working and living are two very different things.

### *Assumption #3*

We do not know anything about the survey. Is it really indicative of how employees feel? Perhaps the survey only asked upper management. Maybe only the engineering department was questioned. Basically, there is no way for us to know whether the sample was representative. Anyhow, the survey - even if it is representative - found that SuperCorp's workers preferred to live, not to work, in areas that are not urban.

### *Assumption #4*

There is nothing in the argument that says that Corporateville is not urban. Perhaps Corporateville is also somewhat urban. We do not know. And be careful not to assume that people typically leave urban areas for the suburbs. Never bring your own preconceived notions into the argument

### *Assumption #5*

Towards the end, the argument mentions that Corporateville is safer. In this same sentence, you will also find mention of lower taxes. If the argument is setting out to prove that Corporateville is a superior place to work than Middlesburg, it has to be more specific about how lower taxes will improve quality of work place.

### *Assumption #6*

The argument ends by saying that Supercorp clearly made the right decision. Even if Corporateville is a better place for Supercorp, to say that the company made "the best decision" is stretching it. Perhaps Supercorp could have moved to a different city, one even better suited to its needs.

## **Takeaways**

The goal of the brainstorming session is not to see how many assumptions you can find. Instead, you want to choose the few that you think best invalidate the argument.

## The Issue Essay

Out of the two essays, the Issue tends to be more difficult for most students. Part of the reason is it is far more difficult to “wing it” on the Issue task than it is on the Argument Task.

The Issue Prompt requires you to respond to a simple statement, by developing a position, and supporting it with convincing examples. To be able to do so you will want to “keep” the following points in mind.

### Keep it organized

Nothing reflects strong essay writing skills like organization. Even an impassioned, cogent response falls apart if it is not bundled into essay form: the introduction, a few body paragraphs, and a conclusion.

The Intro should not be needlessly long, as you try to stuff in everything you want to say. The Intro serves (unsurprisingly) to introduce the topic. Most importantly, the Intro must have a clearly defined thesis statement. Often it is easiest for the writer—and the reader—if the last sentence in the Intro is the thesis.

The body paragraphs should develop your thesis. Finally, the conclusion should recap what’ve you said (don’t try to add any new information).

### Keep it focused

Within the paragraph it is easy for us to lose our way. Perhaps we summarize needlessly, forgetting that the essay requires our analysis of an issue. Maybe our sentences do not link together logically, and we find ourselves rambling. Or, we may find ourselves juggling several hypothetical examples, never really making a compelling case.

So stay focused on analyzing the issue. Make sure your sentences link together, and be sure to develop an example, so that by the end of the paragraph you can persuasively—and clearly—show how your example supports your thesis.

### Keep it engaging

Repetitive sentence structure makes for repetitive reading. Vary up the way you write—don’t be afraid to use a colon (or a dash), drop in a semi-colon, and vary up the syntax. Noun followed by verb followed by adjective implies that you are a hesitant writer. Regardless of your analysis and organization, the overall impression your essay leaves on the graders is a resounding meh.

## Keep it specific

Hypotheticals are fine, if you can use them to convincingly back up your point. However, that's the tough part; "some people," "mankind," or "you" are dull, vague abstractions. If you trying to show that knowledge can sometimes be used for destructive ends, "Oppenheimer's knowledge of nuclear fusion allowed him to create the most destructive weapon the world had ever known" is far more impactful than, "scientists can sometimes use knowledge to hurt us."

## Keep it on topic

Perhaps the most important (lest you wonder why you received a '1' on your essay) is to keep your essay on topic. Imagine you had to write on the mock prompt on knowledge I used above. If you begin talking about how technology is destructive because smartphones cause us to become insular, you have totally forgotten to answer the question, "Knowledge can sometimes used for destructive ends."

## Keep practicing

Writing well is very difficult. It takes a lifetime of diligent practice. Luckily, the GRE essays graders are not judging whether we could be New Yorker staff writers. Even '6' essays are not perfect; while commanding and sophisticated, these essays are not beyond the grasp of many native speakers.

Even as a non-native speaker, with a little practice you can go from a '3' to a '4' and from a '4' to a '5'. But the key is practice. Writing an essay and feeling utterly deflated because it would score below a '3' is fine...as long as you can pick yourself up and tackle another essay prompt, knowing that you can—and will—improve with more practice.

And non-natives don't despair. Two of the preeminent prose stylists of the English-language novel were both non-native English speakers. Joseph Conrad didn't learn English until he was 18 (though his *Heart of Darkness* will confound most 18-year olds native English speakers). And Vladimir Nabokov wrote in both French and Russia before ever committing his pen to English at the ripe age of 25. The first page of *Lolita* alone makes even New Yorker staff writers blush crimson with envy.

## Takeaways

Okay, enough with the pep talk. For practical advice on practicing: click [here](#) for access to hundreds of essay prompts by ETS. Better yet, the actual prompt you see test day may be one of these essays. So set yourself a goal (say, an essay a day) and practice. And remember, your mood coming out of the essay will affect your performance on the other sections. So (for non-native speakers) do Nabokov proud, and for natives with enough practice, maybe you'll be able to show those New Yorker staff writers a thing or two.

# Resources

## Study Plans

Whether you're studying for 1 week or 6 months, it definitely helps to add some structure to your study plan to keep you accountable and motivated. Below is a list of our study guides that include recommended materials and checklists for each stage of your prep:

### [1 Week Study Schedule](#)

#### 1 Month Study Schedules:

- [Daily schedule](#)
- [Weekly schedule](#)
- 

#### 2-3 Month (90 Day) Study Schedules:

- [Weekly Schedule](#)
- [Daily Schedule Version A for Beginners](#)
- [Daily Schedule Version B: Math Focused](#)
- [Daily Schedule Version C: Verbal Focused](#)
- [Daily Schedule Version D for Advanced Students](#)
- 

#### 6 Month Study Schedules

- [Daily Schedule \(for Math Beginners\)](#)
- [Daily Schedule \(Advanced Math\)](#)
- [Weekly Schedule](#)
- 

You can also access all of the study plans above from <http://magoosh.com/gre/gre-study-guides-and-plans/>

# Official Practice Material from ETS

You may have heard that there is no better way to practice for the GRE than by taking a mock exam, especially one written by ETS.

The extent to which this is true depends on how you use the exam. Taking a test once, figuring out your score, and then hoping that your brain will avoid the same kinds of mistakes on the test is wishful thinking. Following the steps below will help you get the most out of a practice test.

## The tests

ETS (the best source for the most accurate practice material) offers a few resources:

- A free PDF practice test (1 practice test)
- The Official Guide book for the Revised GRE (practice questions and exam overviews as well as 1 practice test)
- A CD that comes with the book above (1 practice test)
- Free Powerprep II software (1 practice test)

The tests written by ETS are the best in terms of preparation. ETS creates the GRE you will see on test day, so it provides the best indicator of your score test day. However, some of the material on these tests overlap.

Here's a quick guide to keep track:

- Powerprep and the CD are identical, with 100% of the same material.
- The material on the PDF test is a subset of the material found on both Powerprep and the CD. That means you will see all of the questions on the PDF in Powerprep/CD material, but you won't see all of the Powerprep/CD material on the PDFs.
- Completely separate is the one practice test at the of the Official Guide book, which does not have any overlap with any other material.

Confusing, right? It's best to do as much practice as possible, so you shouldn't worry about overlapping material too much, but you should keep the above distinctions in mind because if you see a question that you've seen previously, you may get the correct answer not because you knew how to do it, but because your brain may just have remembered the answer from last time!

## Mark the questions you get wrong

After figuring out your score, put a mark next the questions you missed. However, do not look at the answer. See if you can figure out why you got the question wrong. Sometimes this mistake can



be attributed to carelessness. Other times there is a conceptual issue. If you are still unsure look at the correct answer and then see if you can figure out *why* it is correct.

## Figure out the question on your own

Looking at an explanation can be harmful in a few ways. First off, many explanations seem more confusing than the actual question. Secondly, by relying on an explanation, you do not force yourself to really think through a question.

With the ETS practice test, there are no explanations given. Again, this will force you to really think through a problem. Of course the reality is you will sometimes be stumped. If that happens...

## Watch our video explanations

If you can't figure out a problem after trying to work it out on your own, check out our [video explanations for each question in the PDF](#) or [the ones for the ETS Official Guide Book](#). Then, if it still doesn't make sense, leave us a comment on our blog. I will be sure to get back to you to help you figure it out.

## Find questions similar to Powerprep II and the Official Guide

Practice tests allow you to determine your strengths and weaknesses. Focus on your weaknesses by finding practice problems that test the concept with which you are struggling. Manhattan GRE and Magoosh are both great resources.

## Take the tests multiple times

The PDF file is static so you the questions will not change. The Powerprep II test, however, differs slightly so that you will see a few new questions when you retake the test. Either way, if you space out enough time between tests, you shouldn't remember too many questions. While the score will not be valid (it will probably be slightly inflated), taking an ETS test under timed conditions is the best way to prepare for test day.

Be sure to review questions, both mistakes and lucky guesses, the way enumerated above.

## Other Tests

No mock test is the same as that provided by ETS. Still, it is important to remember that some are better than others. Manhattan GRE provides five practice tests, all of which have challenging content. Magoosh also allows you to create your own mock tests.

Kaplan tests, judging from their book content, are a poor approximation of the real test. Princeton Review also contains questions that are suspect, too easy, or both. And those tests you find on-

line...well, let's put it this way. I ventured to a site that offered mock "GRE tests." In the math section, almost every other question was a permutation/combination problem. On the actual test you may only get one such question. So much for a faithful approximation of the test.

## Book Reviews

There isn't much out there (yet) in terms of Revised GRE material, but we've reviewed all of the recent prep material that's been released since the official GRE switch happened (in August of 2011). You'll be getting an expert's point of view on all of the following new GRE books:

- [McGraw-Hill's New GRE: 2011-2012 Edition](#) Grade: D-
- [Kaplan New GRE Premier 2011-2012](#) Grade: D+
- [Barron's New GRE 19th Edition](#) Grade: B-
- [Princeton Review: Cracking the New GRE 2012](#) Grade: C
- [McGraw-Hill's Conquering the New GRE Math](#) Grade: A-
- [ETS's Official Guide to the GRE Revised General Test](#) Grade: A+/C
- [ETS's Old GRE Material: Practicing to Take the General Test 10th Edition \(Big Book\)](#) Grade: C+/D-
- [Manhattan GRE](#) Grade: A
- [Gruber's Complete GRE Guide 2012](#) Grade: C-
- [Nova's GRE Prep Course](#) Grade: B/F
- [ETS's Official Guide to the GRE Revised General Test \(2nd Edition\)](#) A+/C
- [GRE for Dummies Premier 7th Edition](#) F/C
- [Manhattan 5 lb Book of GRE Practice Problems Review](#) A
- [Barron's 1100](#) A-
- [Barron's GRE Verbal Workbook](#) D-
- [Barron's 6 GRE Practice Tests](#) B-
- [Manhattan GRE Flashcards](#) A

You can find links to full reviews of all of the books above (and more!) at <http://magoosh.com/gre/new-gre-book-reviews/>

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