



Thank you for your interest in the Official Guide Companion, 11<sup>th</sup> Ed. The following pages are meant to give you an indication of what you can expect from the rest of the book, available for purchase at [GmatFix.com](http://GmatFix.com). This document includes:

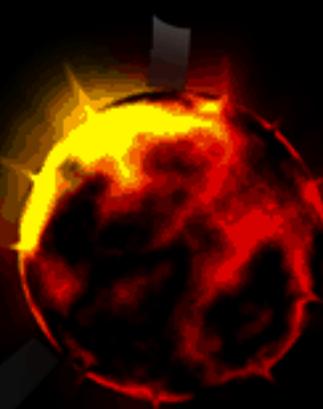
1. Front Cover
2. The table of Contents
3. “About the Author”
4. “Is this book for Me?” aka “A Companion to the Official Guide”
5. A sample solution to show the level of depth you can expect from the OG Companion and to demonstrate exactly how it supplements the Official Guide for GMAT Review

Thank you,

Patrick Siewe  
[GMATFix.com](http://GMATFix.com)

Designed to work  
in sync with the  
Official Guide!

Details on pg. 3



# GmatFix

## Set Your Scores on Fire

# The Official Guide Companion



A thorough Analysis of every math question in  
“The Official Guide for GMAT Review, 11th Edition”



Every question is classified by topic and difficulty level  
so you always know exactly where to find what you need



10 Advanced Speed Drills are designed to give a  
decisive edge to test takers who aim to score above 700

by Patrick Siewe

BY PATRICK SIEWE



Get Digital versions of this book and other FREE prep materials at [www.GMATFix.com](http://www.GMATFix.com)

# Table of Contents

---

<b>ABOUT THE AUTHOR</b> .....	<b>2</b>
<b>A COMPANION TO THE OFFICIAL GUIDE</b> .....	<b>3</b>
<b>HOW TO USE THIS BOOK</b> .....	<b>6</b>
<b>GMAT INTERVIEWS</b> .....	<b>7</b>
<b>DIAGNOSTIC TEST SOLUTIONS</b> .....	<b>16</b>
<b>PROBLEM SOLVING SOLUTIONS</b> .....	<b>73</b>
<b>DATA SUFFICIENCY SOLUTIONS</b> .....	<b>278</b>
<b>ADVANCED SPEED DRILLS</b> .....	<b>420</b>
<b>SPEED DRILLS SOLUTIONS</b> .....	<b>441</b>
<b>TAKE-AWAYS LIST</b> .....	<b>591</b>
<b>REFERENCE</b> .....	<b>595</b>
QUESTIONS DIRECTORY .....	596
QUESTIONS FREQUENCY BY TOPIC .....	599
SCORES TO PERCENTILES CONVERSION SCALES .....	600

# About Patrick Siewe

---

Since 2004, Patrick Siewe has worked as an exam content writer, professional tutor and admissions consultant in New York City. Patrick's focus has been the GMAT exam for business school aspirants, the GRE exam for graduate school candidates, and the SAT exam for college undergrad applicants. Over his still young career, he has conducted classes, small group tutoring and one-on-one tutoring sessions with over three hundred students. He has been subcontracted to write math and verbal questions for the state of New York's Regents examination and for the Princeton Review.

Patrick feels most at home teaching and tutoring and he has had a lot of success in getting the most out of his students. Most of his GMAT 1-on-1 tutoring students see their scores increase by 50 to 180 points<sup>1</sup>. Students who attend Patrick-taught classes see less dramatic improvement, typically 30 to 100 points<sup>2</sup>. Patrick's approach to tutoring yields extraordinary results thanks to his holistic approach to test preparation:

- *Technical Training*, examining each question type and sub-type in detail and teaching the student the skills to solve all question types. One can think of this training as a classic grammar or math academic course.
- *Tactical Training*, teaching the student ways to eliminate wrong answers when facing a question too difficult to properly solve. Problem solving techniques such as “Variable Substitution”, and “Reverse Engineering” can drastically improve a student's odds on a difficult or unfamiliar question. *Tactical Training* also includes teaching the student when to cut his losses and move on from a question.
- *Strategic Planning*, helping the student understand when to take the test, whether to retake the test, how the test is scored, how much time to allot to each question, and how to study in order to transfer hard work into concrete score improvement. Good study skills are lost on most people after high school and are a critical aspect of preparation that is too often ignored by standard prep courses.
- *Psychological Preparation*. Patrick is trained in test anxiety management and makes sure to address this dimension in his tutoring. Too many students simply shut down on test day because fear or anxiety can be overwhelming. Unfortunately, very few GMAT prep programs make it a point to address this issue. It is not possible to completely get rid of anxiety, but there are several useful techniques that can make it manageable. These techniques, like every other, need to be practiced before the day of the test and they are integral to Patrick's GMAT prep curriculum.

Patrick is a native French speaker who learned English in high school. This gives him a particularly good understanding of students who struggle with the verbal section of the GMAT.

Patrick can be contacted via email at [Patrick\\_Siewe@inbox.com](mailto:Patrick_Siewe@inbox.com)

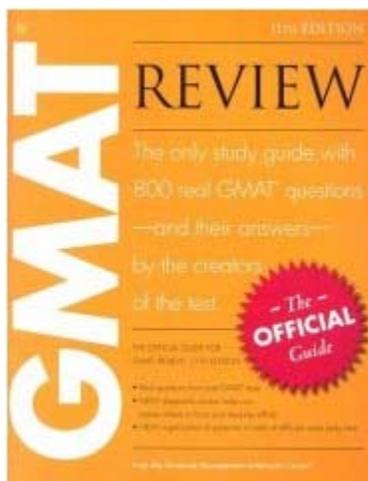
---

<sup>1</sup> Students who receive at least 15 hours of tutoring

<sup>2</sup> Score improvement depends on student diligence in doing the work assigned.

# Use the Official Guide for GMAT Review? The OG Companion Book is for You!

---



The best GMAT practice comes from actual GMAT questions. The most extensive resource of past GMAT questions is the “*Official Guide for GMAT Review, 11<sup>th</sup> Edition*” also known as the Big Orange book or the OG. The importance of understanding every single question in that book cannot be overstated. The OG should be the cornerstone of any GMAT prep program.

Unfortunately, the OG’s flaws prevent many students from getting the most out of it. Below I have outlined complaints from my students about the *Official Guide for GMAT Review*, starting with the most common complaint. This 600 pages Companion book has been designed to complement the OG by addressing these grievances. For each deficiency, I have provided a solution.<sup>3</sup>

**“*The Official Guide* has lots of practice questions but is very thin on theory review. The math section in particular has skimpy explanations insufficient to fully master some questions.”**

The greatest weakness of *The Official Guide* is the lack of details in its math solutions. The primary aim of the *OG Companion* is to provide thorough review of every single math question from *The Official Guide*. One of the beauties of math is that the same problem can often be solved via different approaches. Knowing more about a problem than the bare minimum is necessary to master the problem type and will improve your odds of doing a similar problem better. In this book, you will find two, three, or sometimes four thorough explanations with illustrations for every question. In *The Official Guide*, most solutions are much shorter than this paragraph whereas in the *OG Companion*, solutions are much more thoroughly discussed and are often 2 or 3 pages long. Spend time studying the different ways to solve the same question, because in doing so you will be improving various skills. While writing my solutions, I’ve made sure to point out patterns I’ve noticed in how the question writers attempt to trick students into picking wrong answers.

**“*The Official Guide* doesn’t provide ways to eliminate wrong answers and perform educated guesses when facing very difficult questions. It doesn’t help me improve my test-taking strategy.”**

Unless you are in the top 0.3% of test takers in your math ability, you will run into questions that are either too difficult to do or that would take too long to do. Because you must answer 37 questions in 75 minutes, you have about 2 minutes per question on average on the real exam.

---

<sup>3</sup> To read more about what people liked or didn’t like about the Official Guide, look up “Official Guide for GMAT Review, 11<sup>th</sup> Edition” on Amazon.com and read its user reviews.

This means that you will sometimes need to cut your losses, make an educated guess and move on. Thankfully many GMAT wrong answers can be eliminated with a few clever observations or approximations. Where applicable, my solutions feature a “30 seconds Hack”, a guide to eliminating one or more wrong answers in 30 seconds without actually solving the problem. The Hacks are meant to give you a quick way to drastically increase your guessing odds.

**“Many of the math questions in *The Official Guide* are way easier than those I saw on my real GMAT. Only the last 50 to 75 questions in each math section were on par with the more difficult questions on the actual exam”**

The Official Guide questions are organized by difficulty level, but are geared toward a mainstream audience. If your target score is anything above 650, you may not find enough challenging practice problems in the OG.<sup>4</sup> The *OG Companion* includes a set of 10 advanced speed drills containing 150 questions. These questions were carefully drafted to test the same concepts in the same ways as the GMAT tests. Almost all the questions from these drills are of the 600 – 700 and the 700+ difficulty level. Of course, I have provided explanations to every question for your reviewing fancy. Before you get to these drills however, be sure that you fully complete and understand all the questions from the Official Guide. Doing a lot of difficult questions without having a good grasp of easier and moderate questions can not only be frustrating, but also be counter-productive.

**“I know the Official Guide questions are roughly ordered from easier to harder, but how can I know exactly how difficult a question is so I can better gauge how I’m doing and also know which questions to spend my study time on?”**

In this book, the solution to every Official Guide question includes that question’s difficulty level. There are five levels loosely corresponding to GMAT scores. The difficulty levels are 200-400, 400-500, 500-600, 600-700, and 700+. Along with the difficulty level, each solution specifies which math topics are tested by the question. There are about 20 distinct topics of arithmetic, algebra and geometry, and one question may test multiple topics.

**“If I want to practice a particular question type, it takes too long to read through the pages of the Official Guide looking for questions of that type. There is no easy way to get a listing of questions by topic”**

I have put together a “Reference” section that organizes question numbers by topic and difficulty. If you need to practice “Rate & Work” questions for instance, lookup that topic in the Reference section, select the difficulty level you want to practice and you will see a list of all Official Guide questions that test this concept.

**“I would like a way to know which percentiles different scores correspond to.”**

The “Reference” section of this book offers statistical data on how sub-scores and percentiles correlate with GMAT scores. From this section you can answer questions such as, “What

---

<sup>4</sup> According to my calculations, only about 13.7% of questions in *The Official Guide* are of the 700+ difficulty level

GMAT score should I aim for if I want to be in the top 10% of test-takers?” and “Which essay score would put me in the top 20%?”

**“The Official Guide doesn’t tell me which question types are most common, so I don’t know what topics are most important to master.”**

Not all topics are equal on the GMAT. There are a lot more questions about Fractions & Percentages than questions about Combinations & Permutations. The “Reference” section of this book provides an analysis of the frequency of topics in *The Official Guide*, so you can devise a study plan ensuring that you have mastered the topics that come up the most.

**“I have general questions about the GMAT and the B-school application process that are not addressed in the Official Guide”**

The GMAT Interviews section of this book is comprised of four interviews. Ryan Childs, a GMAT Tutor, goes over how much score improvement you can expect, how to decide between classes and tutoring, how to recognize a good teacher, and how much you can expect to spend on a GMAT prep program. Mia Tallico, a GMAT Program Developer, talks about the registration and rescheduling procedures of the GMAT, what you can expect on test day, how much time you should spend preparing for your exam, and which GMAT prep books are the best. Steven Martins, an admissions consultant, discusses the application essay, work experience, recommendations, and other important aspects of the business school application. Lastly, Christina Chang, my former 740 GMAT student, shares her views on online courses vs. live classes vs. 1-on-1 tutoring, how she organized her study program, and how her score progressed throughout her preparation.

To read more about what people liked or didn’t like about *The Official Guide*, look up “Official Guide for GMAT Review, 11<sup>th</sup> Edition” on Amazon.com and read the user reviews.

The author of *OG Companion 11<sup>th</sup> Ed* can be contacted via email at [Patrick\\_Siewe@inbox.com](mailto:Patrick_Siewe@inbox.com)

# How to Use this Book

The *OG Companion* provides thorough solutions to every single math problem from the “*Official Guide for GMAT Review, 11<sup>th</sup> Edition*”.

**#1, pg.20**

Difficulty Level: 200-400

Topics: Linear Equations; Word Problems

Each solution is headed by an information panel that shows where you can find the corresponding question in *The Official Guide*.

The panel also shows how difficult the question is. There are five difficulty levels: 200-400, 400-500, 500-600, 600-700 and 700+. Finally, the “Topics” line shows which of 20 math topics are tested by that particular question.



**30 Seconds Hack**

Where applicable, I have added a Hack to the standard solutions.

Each hack is a guide to eliminating one or more wrong answers in 30 seconds without actually solving the problem. The Hacks are meant to drastically increase your guessing odds when you cannot solve a problem.

The *Official Guide* solutions are split into three sections in this book: “Diagnostic Test” solutions review the questions from pg 20-25; “Problem Solving” solutions review the questions from pg 152-186; and “Data Sufficiency” solutions review the questions from pg 278-290. Page numbers are not from this book, but are from *The Official Guide*.

A “GMAT Interviews” section includes interviews with four people who have very different perspectives of the GMAT – a tutor, an admission consultant, a GMAT program developer, and a 740 GMAT student. They answer questions about the exam, the study process, the business school applications, and GMAC policies

An “Advanced Speed Drills” section has 10 drills geared for those students who seek to score above 640. I have included this section because *The Official Guide* doesn’t include enough practice with challenging questions. Most questions from that book are for the 450 to 650 scorers. The speed drills are of course accompanied by solutions with explanations.

A “Take-Aways” section lists 53 of the most important lessons you should have learned while going through the Official Guide problems and solutions. These Take-Aways address GMAT specific concepts that you wouldn’t find in standard math manuals such as patterns in the way the question writers attempt to trick test-takers.

Finally, a “Reference” section organizes every question in the Official Guide by topic and difficulty, so if you need to practice a particular math topic you can quickly devise a study plan. The Reference section also includes information about how GMAT scores and sub-scores translate to percentiles. Finally, this section measures the frequency with which every math topic is tested on the GMAT, so you can determine which topics are most important to master.

## GMAT Interviews

---

- Ryan Childs, GMAT Tutor
- Mia Tallico, GMAT Program Developer
- Steven Martins, Admissions Consultant
- Christina Chang, GMAT Student

## Ryan Childs, Tutor - 770

	Raw Score	Percentile
Analytical Writing	6.0	95%
Quantitative	51	99
Verbal	44	97
<b>OVERALL</b>	<b>770</b>	<b>99</b>

*Ryan Childs is a GMAT, GRE, and LSAT tutor in New York City. He specializes in large corporate classes but occasionally takes on individual students. Ryan has been teaching the GMAT for over 5 years. To date, he has helped countless students improve their GMAT performance and enroll in Business school.*

---

### **What is the first thing you would say to someone who is considering taking the GMAT?**

Too many students claim that they want to do what it takes to get a great GMAT score, but 3 or 4 weeks later, they've already fallen behind assignments. This exam requires a lot of work. Before starting the GMAT preparation process, find out why. Ask yourself "Why take the GMAT?" "Why go to business school?" "Why get an MBA in \_\_\_?" "Why make all these sacrifices?" You will find that ultimately, you may want to take the GMAT because you want more freedom with your time, more respect from peers, more comfort for yourself and family, etc... Now consider what effort is necessary to fully prepare for the test. Are you prepared to spend 10-15hrs every single week of dedicated, focused study? If you find the gains to be worth the sacrifices, great. Whenever you catch yourself wanting to give up or cut corners, visualize the goal and remember why you first chose to make these sacrifices.

### **How much improvement can students expect from a GMAT preparation program?**

First, it's important to realize that the higher your score, the harder it is to improve. Thus, the increase in ability required to go from a 550 to a 600 is a lot smaller than that required to go from a 700 to a 750. Another consideration is that one really shouldn't compare test scores from different sources. A Princeton Review or Kaplan GMAT score isn't derived using the same algorithm as an official GMAT score. So... your initial level should be based either on an official test or on a GMATPrep<sup>5</sup> exam, because both are from GMAC and have similar questions and identical scoring algorithms. From my experience, students who take a class can expect to see 30-90 points improvements while those who hire a *good* tutor can expect anywhere from 50-150 points.

I'd also like to add that some companies offer "score improvement guarantees", but these require that the student attend all classes and complete all work assigned. This is as it should be, for without doing all the work, you won't see all the benefits.

### **Which is better: Tutoring or Classes?**

The short answer: *good* tutoring is the best option. In all educational environments, a lower student-to-teacher ratio is usually indicative of higher quality of education thanks to the increased individual attention that the students receive. This advantage is reflected in my students' score improvements: My tutoring clients tend to score 30 or 40 points more than my

---

<sup>5</sup> GMATPrep is a free test software that can be obtained from MBA.com after registration

classroom clients. However, as with most things, this issue is a bit more complex. A more appropriate question may be “Which is better for me?” Among other things, students should consider financial considerations. Are the extra 30 or 40 points you would get from tutoring worth the extra money it would cost to get a tutor? Another important consideration is the ability of the tutor. Most courses are the result of established prep programs that the teacher simply needs to follow. The teacher’s ability is important, but an average teacher can deliver pretty good results with a good prep program. On the other hand, the ability of the tutor is second in importance only to the student’s work ethic as far as improvement is concerned. If your tutor is unproven, be wary.

### **How can a student recognize a good tutor from their first meeting?**

Ask your tutor what his GMAT score is. At a minimum, a good tutor must have a 720 GMAT score, meaning that he or she must be in the top 5% of all scorers. If your tutor hesitates to tell you his score, this should raise a red flag. Even the best teacher can only teach what he knows.

Did the tutor set clear expectations either before or at the start of your meeting? Did the tutor show up on time and prepared? The answer to these questions will inform you as to whether your tutor is well organized, organization being an important trait of any GMAT prep program.

Is your tutor a good student? The best tutors are great students. They will patiently listen to what you have to say, and try to learn as much as possible from you, because knowing the student’s learning process is crucial in helping him improve his score. A tutor cannot figure out your learning process unless he allows enough time for questions, listens closely to what you have to say, and *responds* to you rather than spew out a memorized teaching speech. Generally, a 1hr meeting is sufficient to determine whether your instructor is likely to be a good one.

### **How much should a good GMAT prep program cost?**

For classroom courses, most of the major companies charge between \$36 per hour for Veritas to \$60 for Kaplan. For private tutoring, I believe rates go from \$163 per hour for Kaplan to \$200 for Veritas and Manhattan GMAT. The Princeton Review has three types of tutors, with the cheapest – and least experienced – costing \$125 per hour while the most experienced cost over \$350 per hour. Of course, these figures probably vary depending on the location.

If you choose to opt for a lesser known option, quality can vary widely, so be careful and don’t be too shy to ask for references. A good independent tutor may offer the best value, but may also be a more risky choice.



Now that you've seen some of the introductory chapters of GMATFix.com's *OG Companion*, let's get to the next segment. The question below is an excerpt from the *Official Guide for GMAT Review, 11<sup>th</sup> Edition*. By comparing how the Official Guide explains this question to how GMATFix.com's *OG Companion* explains it, you will see exactly how this book can take your GMAT prep program up a notch.

Try solving the question below in no more than 3 minutes:

- 
193. In a certain calculus class, the ratio of the number of mathematics majors to the number of students who are not mathematics majors is 2 to 5. If 2 more mathematics majors were to enter the class, the ratio would be 1 to 2. How many students are in the class?
- (A) 10  
(B) 12  
(C) 21  
(D) 28  
(E) 35
- 

Now take a look on the next page at the explanation given in the *Official Guide for GMAT Review 11<sup>th</sup> Ed.* This explanation for one of the more difficult questions in the book takes less than half a page, and includes a reprint of the original question.

Then go one page further and look at the explanation to the same question that you'll find in GMATFix.com's *OG Companion*. Note that this nearly 3 pages long, includes a 30-second hack and three different approaches to the problem. The explanation is then followed by the lesson to be learned from this question, so that you may have a better shot at solving similar problems.

193. In a certain calculus class, the ratio of the number of mathematics majors to the number of students who are not mathematics majors is 2 to 5. If 2 more mathematics majors were to enter the class, the ratio would be 1 to 2. How many students are in the class?
- (A) 10  
(B) 12  
(C) 21  
(D) 28  
(E) 35

**Algebra Simultaneous equations + Applied problems**

Letting  $m$  represent the number of mathematics majors and  $n$  represent the number of non-mathematics majors in the class, the information given about the current student ratio can be

expressed as  $\frac{m}{n} = \frac{2}{5}$ . The information about

the ratio of students after adding 2 more

mathematics majors can be expressed as

$\frac{m+2}{n} = \frac{1}{2}$ . Using these two relationships,

solve the first equation for  $m$  by multiplying

and simplifying:  $\frac{m}{n} = \frac{2}{5}$  or  $5m = 2n$  or  $m =$

$0.4n$ . Then, substitute  $0.4n$  for  $m$  in the second

equation, and solve for  $n$  by multiplying and simplifying as follows:

$$\frac{0.4n+2}{n} = \frac{1}{2}$$

$$0.8n+4 = n$$

$$4 = 0.2n$$

$$20 = n$$

Finally, substitute 20 for  $n$  in the equation

$$\frac{m}{n} = \frac{2}{5}, \text{ and solve for } m:$$

$$\frac{m}{20} = \frac{2}{5}$$

$$5m = 40$$

$$m = 8$$

Therefore, it can be determined that there are

$$20 + 8 = 28 \text{ students in the class.}$$

**The correct answer is D.**

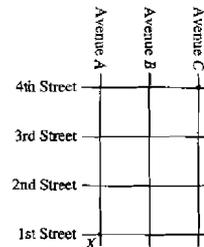
194. What is the units digit of  $(13)^4(17)^2(29)^3$ ?

- (A) 9  
(B) 7  
(C) 5  
(D) 3  
(E) 1

**Arithmetic Operations on rational numbers**

The units digit of  $13^4$  is 1, since  $3 \times 3 \times 3 \times 3 = 81$ ; the units digit of  $17^2$  is 9, since  $7 \times 7 = 49$ ; and the units digit of  $29^3$  is 9, since  $9 \times 9 \times 9 = 729$ . Therefore, the units digit of  $(13)^4(17)^2(29)^3$  is 1, since  $1 \times 9 \times 9 = 81$ .

**The correct answer is E.**



195. Pat will walk from intersection  $X$  to intersection  $Y$  along a route that is confined to the square grid of four streets and three avenues shown in the preceding map. How many routes from  $X$  to  $Y$  can Pat take that have the minimum possible length?

- (A) 6  
(B) 8  
(C) 10  
(D) 14  
(E) 16

**Arithmetic Elementary combinatorics**

In order to walk from intersection  $X$  to intersection  $Y$  by one of the routes of minimum possible length, Pat must travel only upward or rightward between the intersections on the map. Let  $U$  represent upward movements and  $R$  represent rightward movements. It takes 3 upward and 2 rightward movements to complete the route.

Replace the roots with 1.5  $\rightarrow$   $(1.5+1)(1.5-1)(1.5+1)(1.5-1) = (2.5)(0.5)(2.5)(0.5)$

Change decimals to fractions  $\rightarrow$   $= \frac{5}{2} \cdot \frac{1}{2} \cdot \frac{5}{2} \cdot \frac{1}{2} = \frac{25}{16}$

Answer choice A is closest to our estimate.

Guess A

### **Solution**

Recognize this question as a test of the factoring  $(x-y)(x+y) = (x^2 - y^2)$ . With this in mind, the question can be solved very quickly

$$\begin{aligned} [(\sqrt{2}+1)(\sqrt{2}-1)][(\sqrt{3}+1)(\sqrt{3}-1)] &= (\sqrt{2}^2 - 1^2)(\sqrt{3}^2 - 1^2) \\ &= (2-1)(3-1) = 2 \end{aligned}$$

**The correct answer is A**

#193, pg.178

Difficulty Level: 700+

Topics: Ratios & Proportions; Word Problems



### **30 Seconds Hack**

You can get to the right answer in 15 seconds. The original ratio is 2 to 5 (ratio has a total of 7 parts). So the total number of students must be a multiple of 7. Cross off A and B.

Once we add 2 students, the ratio becomes 2 to 1 (ratio has a total of 3 parts). So if we add 2 to the total, the new number of students must be a multiple of 3. Of the remaining answer choices (21, 28 and 35), only D will get us a multiple of 3 after we add two more students

Guess D

### **Solution A**

There are two ratios mentioned. The initial ratio is 2:5 and the new ratio is 1:2 after we add 2 math majors. One way to do this question is to build two equations one for each ratio:

$$\text{“Math to non-Math is 2:5”} \rightarrow \frac{m}{n} = \frac{2}{5} \rightarrow 2n = 5m \rightarrow n = \frac{5m}{2} \quad (\text{Eq. 1})$$

$$\text{“+2 Math and ratio becomes 1:2”} \rightarrow \frac{m+2}{n} = \frac{1}{2} \rightarrow n = 2m+4 \quad (\text{Eq. 2})$$

$$\text{Combine the equations (Eq. 1) and (Eq. 2)} \rightarrow \frac{5m}{2} = 2m+4 \rightarrow 5m = 4m+8 \rightarrow m = 8$$

$$\text{Plug the new value of } m \text{ into (Eq. 2)} \rightarrow n = 2(8)+4 = 20$$

So  $m$  is 8 and  $n$  is 20. There are 28 students

**The correct answer is D**

### **Solution B**

There is a much faster way. You can combine the two given ratios into one equation directly.

Initial ratio of math to non-math can be expressed as  $\frac{2x}{5x}$  where  $2x$  is the number of math and  $5x$  is the number of non-math majors (total is  $7x$ ). If we add 2 math majors to these numbers, we're told the new ratio will be 1 to 2. This change can be expressed as  $\frac{2x+2}{5x} = \frac{1}{2}$ . Now you have an equation; solve it for the total number of students ( $7x$ )

$$\text{Cross multiply} \rightarrow 4x+4 = 5x \rightarrow x = 4$$

$$\text{Find the total number of students (7x)} \rightarrow 7x = 7 \cdot 4 = 28 \text{ students}$$

**The correct answer is D**

### **Solution C – Reverse Engineering**

When a question gives you non-variable answers along with a word problem, you can often use reverse engineering.

Reverse Engineering is working from the answer choices, to find which choice can perfectly accommodate all the given data in the question. For an explanation of the Reverse Engineering technique, please refer to “Solution B” of “Diagnostic Test Question #12, pg.22”.

Let's reverse engineer the question and figure out which answer choice gives us the correct ratio of 1 to 2 after we add 8 math majors. Keep in mind that a ratio of math to non-math of 2:5 (7 total parts) means that math is  $\frac{2}{7}$  of the total, and non-math is  $\frac{5}{7}$  of the total.

How many students?	Math majors & non-math majors (in 2:5 ratio)	New ratio after adding 2 math (should be 1:2)	Notes
(A) 10	--	--	No need to deal with fractions of people
(B) 12	--	--	Same as above
(C) 21	6 math & 15 non-math	8:15	Final ratio should be 1:2
(D) 28	8 math & 20 non-math	10:20 → <b>1:2</b>	<b>Yes!</b> Starting with 28 students gives us the correct final ratio
(E) 35	10 math & 25 non-math	12:25	Final ratio should be 1:2

**The correct answer is D**

#### Take-Aways

- When a question gives you non-variable answers choices along with a word problem, you can often use reverse engineering. Start with answer C, especially if it will take more than a few seconds to check each answer.

---

### #194, pg.178

Difficulty Level: 600-700

Topics: Number Properties; Functions & Sequences

#### **Solution**

Note that the units digit of  $13^4$  is the same as that of  $3^4$  since in multiplication, the units digit of the result depends only on the units digit of each factor.  $3^4$  has units digit of 1.

Likewise, the units digit of  $17^2$  is the same as that of  $7^2$  and is 9.

The units digit of  $29^3$  is the same as that of  $9^3$  and is 9.

Finally, the units digit of  $13^4 \cdot 17^2 \cdot 29^3$  is equal to the units digit of  $1 \cdot 9 \cdot 9$ , which is 1.

**The correct answer is E**

---

### #195, pg.178

Difficulty Level: 700+

Topics: Combinations, Permutations & Factorials



As I'm sure you noticed, the *OG Companion* adds these features to what is already provided by the Official Guide solutions

- More thorough solutions
- Multiple approaches to solving each problem
- Labeling of difficulty level of and concepts tested by the question
- 30-Second Hack, or "how to guess"
- One or more Take-Away lesson at the end of the solution

The *OG Companion* offers a lot more than was shown in this preview. We haven't gone over the Advanced Speed Drills section which offers 10 drills and about 12hrs of additional practice for those who aim to score near or above 700.

The book also includes a Reference section to which you can turn if you want to quickly find Official Guide practice questions similar to the one you've just completed. Don't waste your time flipping through hundreds of pages to find a particular kind of question. Just refer to our Reference.

If I haven't made it clear yet, ownership of *The Official Guide* is necessary to take full advantage of GMATFix's *Official Guide Companion*

You can find this book along with other GMAT Prep resources on my webpage, at [www.GMATFix.com](http://www.GMATFix.com)

Thanks for reading,

Patrick Siewe ☺



This book has been carefully designed to address my students' specific concerns regarding "The Official Guide for GMAT Review, 11th Edition"

A priceless add-on to anyone who uses the Official Guide!

See pg. 3

## 30 Seconds Hack

When you face a question too tough to solve, Hack it! I will show you how in 30 seconds you can eliminate 2 or 3 wrong answers without solving



## Reference Section

Organize every question by topic and difficulty, and measure how often each topic appears on the test to make your study planning easy

## In Depth OG Analysis

The OG devotes 149 pgs to its solutions. I've added 399 pgs of additional analysis and brand new explanations so you can build a deeper understanding.



## Take-Aways List

A list of 53 tips, tricks and lessons that I've learned from doing all the available official GMAT\* questions. A must-have!

## Advanced Speed Drills

Refine your pacing, guessing and solving skills with a set of challenging timed drills designed to test the same concepts as the GMAT\*. Solutions are included.



## GMAT\* Interviews

4 very different, honest perspectives on the GMAT\*, the most effective study techniques, and business school applications.

## Comments from my Students

"Everyone uses the Orange book because it has hundreds of real GMAT questions, but its solutions are way too thin. The OG Companion gave me deep explanations and often 3 or 4 new ways to solve each question. It's a fantastic resource"  
-- Brenda D., New York NY

"What I liked most about the OG Companion is the Advanced Speed Drills because although the Official Guide offers plenty of practice, its questions are aimed at a general audience, and don't offer as much to the highest scorers"  
-- Will H., New York NY

ISBN 978-0-163-00000-0



9 780163 000000