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数学2

Subject Test
Math Level 2 (12th edition)

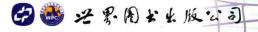
[美] 库 (Richard Ku) 编著

(第12版)

备考指南 考点透析

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(含1张CD-ROM)



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Subject Test Math Level 2 (12

目录

习题 1~3

第7章 三角函数

20 11 1/1 1	43 - 151		Territories Venior	(AA) = (A) M 78 158
				08-1回区14
绪论			機面が	第8章 指数函数与对数
		第一部分	诊断测试	(H) - (A) 剛元 162
诊断测证	t			01-1 MK 169
答案				茂函野声 章0.22
答案角	释析			(3) - (4) 附汞 123
自评表	長			30
智19道				第10章 参数方程
711 3 18 1		第二部分	考点复习	
第1章				E = 1 1915. 35
示例	$(A) \sim (T)$			被面景分量面数
	1 ~ 18			(H)~(A)顺景 141
第2章	线性函数			8-1987 47
示例	$(A) \sim (I)$			77 12章 变换及对称
习题	1 ~ 7			(A) 附表 (49
第3章	二次函数			4-118 53
示例	$(A) \sim (G)$			面掛掛圖 章 图 转 3
习题	1 ~ 7			(3) - (A) Mar 55
第4章	高阶多项式			0-195 59
高 科 示例	(A) ~ (H)			60 14章 极坐标
习题	1 ~6			(a) - (A) Ma 63
第5章	多项式不等式的]求解		€-1
示例	$(A) \sim (C)$			65

66

第6章	三角几何	69
示例	î] (A) ~ (I)	72
习是	页 1 ~13	76
第7章	三角函数	83
示例	il (A) ~ (AA)	85
习题	页 1 ~ 30	94
第8章	指数函数与对数函数	105
示例	N(A)~(H)	105
习是	页 1 ~ 10	108
第9章	有理函数	111
示例	1 (A) ~ (G)	神童業 帝 111
习是	页 1 ~ 5	类型章 114
第10章	参数方程	117
示例	1 (A) ~ (C)	117
7是	页 1 ~ 3	119
第11章	5 分段函数	(T) (A) N 121
示例	刊(A)~(H)	81 - 1 121
习是	页 1 ~ 8	· 发面封台 章S ¹²⁴
第12章	变换及对称	(1) - (1) 順張129
示例	n (A) ~ (I)	7 - 1 BU 129
习是	01~4	漫画 欢二 章8 ¹³²
第13章	固维截面	(3) = (人) 顾示135
示例	刊(A)~(G)	₹- [B ₹- 139
	五1~6	大页圣侗高 章A ¹⁴¹
第14章		(H) - (A) M/2 145
示例	刊(A)~(D)	ð- 1 ME 145
	页 1 ~ 3	型。 單來的大等不大政を 章 a l 47
E8		示例(A) = (C)

Contents

第15章 三维几何	149
下例(A)~(H)	S
7题1~6	153
第16章 计算	在 集集机
	155
示例 (A) ~ (F)	155 E 2 157
习题 1 ~ 10	TIC TEST 157
第17章 复数	161
示例(A)~(C)	太平自162
7起1~0	162
18Self-Evaluation Chart 第18章 矩阵	165
747	
(A) ~ (J)	A FOR TOPICS
200 习题 1 ~ 12	秀有自169
第19章 数列与级数	さ頭 175
示例(A)~(S)	175
月 习题 1~5	理職案咨 180
第20章 向量	183
示例 (A) ~ (B)	183
	183
Quadratic Functions	发素制 机
第21章 统计	187
示例(A)~(H)	187
习题 1~8	191
第22章 概率	195
(A) ~ (I)	195
习题 1~8	
第三部	
Triangle Trigonometry	
测试题1,是2019年	
答案	219
答案解析	220

自评表	耐八數三 章 章
测试题2	(H) (A) M 231
[6] 答案	0 - 1 100 - 245
答案解析 自评表	246 252
测试题3	(1) = (4) (4) (257
答案 答案解析	269 270
201 自评表	(3) - (人) 陸京 277
测试题4	281
答案	型
答案解析	(山) - (人) 附添 293
901 自评表	£1 - 1 74 F- 299
测试题5	808章 数列与级数
答案	(8) (A) M = 314
答案解析	2 ~ 1 ₩ K 315
自评表	321
测试题6	325
答案	E- 1 15 1- 336
答案解析 自评表	337 343
公式汇总	345
Better with the control of the contr	第22章 概率
索引	349

The ball the conduction of

Contents

	Introduction	1
	- Marriage	
	Maclonal Functions PART 1	
	DIAGNOSTIC TEST	
	- ENGINEEP TO THE PROPERTY OF	0
	Diagnostic Test	
	Answer Key	
	Answers Explained	
	Self-Evaluation Chart	30
	Proleability PART 2	
	REVIEW OF MAJOR TOPICS	
1	Functions	35
nt.	Examples (A)-(T)	36
	Exercises 1-18	
	Exercises 1-4	
2	Linear Functions	47
	Examples (A)-(I)	47
	Exercises 1-7	
M.		
3	Quadratic Functions	
	Examples (A)-(G)	53
	Exercises 1-7	55
4	Higher Degree Polynomials	59
M.	Examples (A)-(H)	60
	Exercises 1-6	63
5	Solving Polynomial Inequalities	65
	Examples (A)-(C)	65
	Exercises 1-3	66
6	Triangle Trigonometry	69
	Examples (A)-(I)	72
	Exercises 1-13	

7	Trigonometric Functions	83
	Examples (A)-(AA)	8585
		94
8	Exponential and Logarithmic F	unctions105
	Examples (A)-(H)	105
	Exercises 1-10	108
9	Rational Functions	111
	Examples (A)-(G)	DITEONORIU 111
	Exercises 1-5	114
e		Plagnostic Test
10		117
	Examples (A)-(C)	717 Answers Explained
	Exercises 1-3	en I Beolf-Evaluation Chart
11	Piecewise Functions	121
	Examples (A)-(H)	121 REVIEW OF MAJ
		124
		1 Eunetions
12	THE RESIDENCE OF THE PROPERTY	129
	Examples (A)-(I)	80-1 seemen 3117 129
	Exercises 1-4	132
VA.		2 Linear Functions
13		
		951 Exercises 1-7
	Exercises 1-6	141 3 Quadvatic Functions
14		145
-		
		145 Exercises 1–7
		147. 4. Higher Degree Polynomials
15		149
	Examples (A)-(H)	051 Exercises 1–6.
	Exercises 1-6	153
		5 Solving Polynomial Inequalities
16	Control of the Contro	155
	Examples (A)-(F)	751 Exercises 1–3
		157 ydemonoght eignaint a
17		161
ac.		
		162 Examples 1-13
	Exercises 1-6	162

18	Matrices	165	
	Examples (A)-(J)	165	
	Exercises 1-12		
CE			
19	Sequences and Series		
	Examples (A)-(S)	a freT leboM 175	
	Exercises 1–5		
	Test. This look can be used as a self-attaly study on as bein		
20	Vectors		
	Exercises 1-3	e-3 to vienimus 10.1	
	You can register by SAT subject To use the College Board's web		
-	Statistics		
21	Statistics	187	
	Examples (A)-(H)	187	
	Exercises 1–8	191	
22	Probability	195 : Accorate information	
	Examples (A)-(I)	his specification to register for the last set of	
	Exercises 1–8		
	Ten can explain an layer estatings and part of the determine with		
	MODEL TESTS		
	If you been to apply for parassing to a codege program to me		
	Model Test 1	plect Test. If you have been	
	Answer Key		
	Answers Explained		
	Self-Evaluation Chart	226	
	OVERVIEW OF THIS HOOK AND HER	1 4 6 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	
	Model Test 2		
	Answer Key	245	
	Answers Explained	246	
	Self-Evaluation Chart		
	correct souwer choice, and the chapter stander of the relevant top		
	Model Test 3	257	
	Answer Key	269	
	Answers Explained		
	Self-Evaluation Chart	277	
	the northest destribution establested by the College Blood. The percent	ntage of questions for which	
	Model Test 4	narely the same as that so co-	
	Answer Key		
	Answers ExplainedSelf-Evaluation Chart	299	

Model Test 5	.303
Answer Key	314
Answers Explained	
Self-Evaluation Chart	
Sequences and Series	
Model Test 6	325
Answer Key	
Answers Explained	
Self-Evaluation Chart	
Summary of Formulas	34
	1
Index	349
Probability	
Exercises 1-8	
The state of the tenter titles and the state of the state	
AND AND ADDRESS OF THE PARTY OF	
Total Hes 1-4	
Model Test Test	
Conic Sactions very reward	
Self-Evaluation Chart	
Model Test 2	
Tives-Ownerstonal distinctry	
Europe (A) (A) (A)	
Answer Key	
Answers Explained	
Self-Evaluation Chart	
Example: A	
Exercise 1 0	
Answers Explained	

Introduction 绪论

he purpose of this book is to help you prepare for the SAT Level 2 Mathematics Subject Test. This book can be used as a self-study guide or as a textbook in a test preparation course. It is a self-contained resource for those who want to achieve their best possible score.

Because the SAT Subject Tests cover specific content, they should be taken as soon as possible after completing the necessary course(s). This means that you should register for the Level 2 Mathematics Subject Test in June after you complete a precalculus course.

You can register for SAT Subject Tests at the College Board's web site, www.collegeboard.org; by calling (866) 756-7346, if you previously registered for an SAT Reasoning Test or Subject Test; or by completing registration forms in the SAT Registration Booklet, which can be obtained in your high school guidance office. You may register for up to three Subject Tests at each sitting.

Colleges use SAT Subject Tests to help them make both admission and placement decisions. Because the Subject Tests are not tied to specific curricula, grading procedures, or instructional methods, they provide uniform measures of achievement in various subject areas. This way, colleges can use Subject Test results to compare the achievement of students who come from varying backgrounds and schools.

Important Reminder

Be sure to check the official College Board web site for the most accurate information about how to register for the test and what documentation to bring on test day.

You can consult college catalogs and web sites to determine which, if any, SAT Subject Tests are required as part of an admissions package. Many "competitive" colleges require the Level 1 Mathematics Test.

If you intend to apply for admission to a college program in mathematics, science, or engineering, you may be required to take the Level 2 Mathematics Subject Test. If you have been generally successful in high school mathematics courses and want to showcase your achievement, you may want to take the Level 2 Subject Test and send your scores to colleges you are interested in even if it isn't required.

OVERVIEW OF THIS BOOK 本书概论

A Diagnostic Test in Part 1 follows this introduction. This test will help you quickly identify your weaknesses and gaps in your knowledge of the topics. You should take it under test conditions (in one quiet hour). Use the Answer Key immediately following the test to check your answers, read the explanations for the problems you did not get right, and complete the Self-Evaluation Chart that follows the explanations. These explanations include a code for calculator use, the correct answer choice, and the chapter number of the relevant topic in the Part 2 "Review of Major Topics." For your convenience, the Self-Evaluation Chart is also keyed to these locations.

The majority of those taking the Level 2 Mathematics Subject Test are accustomed to using graphing calculators. Where appropriate, explanations of problem solutions are based on their use. Secondary explanations that rely on algebraic techniques may also be given.

Part 3 contains six model tests. The breakdown of test items by topic approximately reflects the nominal distribution established by the College Board. The percentage of questions for which calculators are required or useful on the model tests is also approximately the same as that specified by the College Board. The model tests are self-contained. Each has an answer sheet and a complete set of directions. Each test is followed by an answer key, explanations such as those found in the Diagnostic Test, and the Self-Evaluation Chart.

A summary of formulas is given after Model Test 6. These are organized by the chapters of the review section.

OVERVIEW OF THE LEVEL 2 SUBJECT TEST SAT || 数学2概述

The SAT Mathematics Level 2 Subject Test is one hour in length and consists of 50 multiple-choice questions, each with five answer choices. The test is aimed at students who have had two years of algebra, one year of geometry, and one year of trigonometry and elementary functions. According to the College Board, test items are distributed over topics as follows:

- Numbers and Operation: 5–7 questions
 Operations, ratio and proportion, complex numbers, counting, elementary number theory, matrices, sequences, series, and vectors
- Algebra and Functions: 24–26 questions
 Work with equations, inequalities, and expressions; know properties of the following classes of functions: linear, polynomial, rational, exponential, logarithmic, trigonometric and inverse trigonometric, periodic, piecewise, recursive, and parametric
- Coordinate Geometry: 5–7 questions sold and all the property of the Symmetry, transformations, conic sections, polar coordinates
 - Three-dimensional Geometry: 2–3 questions

 Volume and surface area of solids (prisms, cylinders, pyramids, cones, and spheres); coordinates in 3 dimensions
 - Trigonometry: 6–8 questions

 Right triangles; laws of sines and cosines; radian measure; Pythagorean identities, and double-angle identities
 - Data Analysis, Statistics, and Probability: 3-5 questions
 Measures of central tendency and spread; graphs and plots; least squares regression (linear, quadratic, and exponential); probability

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As noted earlier, most taking the Level 2 Mathematics Subject Test are familiar with the use of a graphing calculator. In addition to performing the calculations of a scientific calculator, graphing

Note

To make them as specific and succinct as possible, calculator instructions in the answer explanations are based on the TI-83 and TI-84 families of calculators.

calculators can be used to analyze graphs and to find zeros, points of intersection of graphs, and maxima and minima of functions. Graphing calculators can also be used to find numerical solutions to equations, generate tables of function values, evaluate statistics, and find regression equations. The author assumes that readers of this book plan to use a graphing calculator when taking the Level 2 test.

You should always read a question carefully and decide on a strategy to answer it before deciding whether a calculator is necessary. A calculator is useful or necessary on only 55–65 percent of the questions. You may find, for example, that you need a calculator only to evaluate some expression that must be determined based solely on your knowledge about how to solve the problem. In both the Diagnostic Test and Model Tests, an asterisk (*) in the Answers Explained sections indicates questions on which a graphing calculator is necessary or useful.

Most graphing calculators are user friendly. They follow order of operations, and expressions can be entered using several levels of parentheses. There is never a need to round and write down the result of an intermediate calculation and then rekey that value as part of another calculation. Premature rounding can result in choosing a wrong answer if numerical answer choices are close in value.

On the other hand, graphing calculators can be troublesome or even misleading. For example, if you have difficulty finding a useful window for a graph, perhaps there is a better way to solve a problem. Piecewise functions, functions with restricted domains, and functions having asymptotes provide other examples where the usefulness of a graphing calculator may be limited.

Calculators have popularized a multiple-choice problem-solving technique called backsolving, where answer choices are entered into the problem to see which works. In problems where decimal answer choices are rounded, none of the choices may work satisfactorily. Be careful not to overuse this technique.

The College Board has established rules governing the use of calculators on the Mathematics Subject Tests:

- You may bring extra batteries or a backup calculator to the test. If you wish, you may bring both scientific and graphing calculators.
 - Test centers are not expected to provide calculators, and test takers may not share calculators.
- Notify the test supervisor to have your score cancelled if your calculator malfunctions during the test and you do not have a backup.
- Certain types of devices that have computational power are not permitted: cell phones, pocket organizers, powerbooks and portable handheld computers, and electronic writing pads. Calculators that require an electrical outlet, make noise or "talk," or use paper tapes are also prohibited. A list of allowable calculators can be found on the College Board's web site collegereadiness.collegeboard.org/sat/taking-the-test/calculator-policy.
 - You do not have to clear a graphing calculator memory before or after taking the test. However, any attempt to take notes in your calculator about a test and remove it from the room will be grounds for dismissal and cancellation of scores.

HOW THE TEST IS SCORED 如何评分 and and an and and and warren and and warren

There are 50 questions on the Math Level 2 Subject Test. Your raw score is the number of correct answers minus one-fourth of the number of incorrect answers, rounded to the nearest whole number. For example, if you get 30 correct answers, 15 incorrect answers, and leave 5 blank,

your raw score would be $30 - \frac{1}{4}$ (15) ≈ 26 , rounded to the nearest whole number.

Raw scores are transformed into scaled scores between 200 and 800. The formula for this transformation changes slightly from year to year to reflect varying test difficulty. In recent years, a raw score of 44 was high enough to transform to a scaled score of 800. Each point less in the raw score resulted in approximately 10 points less in the scaled score. For a raw score of 44 or more, the approximate scaled score is 800. For raw scores of 44 or less, the following formula can be used to get an approximate scaled score on the Diagnostic Test and each Model Test:

S = 800 - 10(44 - R), where S is the approximate scaled score and R is the rounded raw score.

The self-evaluation page for the Diagnostic Test and each Model Test includes spaces for you to calculate your raw score and scaled score.

STRATEGIES TO MAXIMIZE YOUR SCORE 提分策略

- Budget your time. Although most testing centers have wall clocks, you would be wise to have a watch on your desk. Since there are 50 items on a one-hour test, you have a little over a minute per item. Typically, test items are easier near the beginning of a test, and they get progressively more difficult. Don't linger over difficult questions. Work the problems you are confident of first, and then return later to the ones that are difficult for you.
- Guess intelligently. As noted above, you are likely to get a higher score if you can confidently eliminate two or more answer choices, and a lower score if you can't eliminate any.
- Read the questions carefully. Answer the question asked, not the one you may have expected. For example, you may have to solve an equation to answer the question, but the solution itself may not be the answer.
- Mark answers clearly and accurately. Since you may skip questions that are difficult, be sure to mark the correct number on your answer sheet. If you change an answer, erase cleanly and leave no stray marks. Mark only one answer; an item will be graded as incorrect if more than one answer choice is marked.





Leave your cell phone at home, in your locker, or in your car!



- Change an answer only if you have a good reason for doing so. It is usually not a good idea to change an answer on the basis of a hunch or whim.
- As you read a problem, think about possible computational shortcuts to obtain the correct answer choice. Even though calculators simplify the computational process, you may save time by identifying a pattern that leads to a shortcut.
- Substitute numbers to determine the nature of a relationship. If a problem contains only variable quantities, it is sometimes helpful to substitute numbers to understand the relationships implied in the problem.
- Think carefully about whether to use a calculator. The College Board's guideline is that a calculator is useful or necessary in about 60% of the problems on the Level 2 Test. An appropriate percentage for you may differ from this, depending on your experience with calculators. Even if you learned the material in a highly calculator-active environment, you may discover that a problem can be done more efficiently without a calculator than with one.
- Check the answer choices. If the answer choices are in decimal form, the problem is likely to require the use of a calculator.

STUDY PLANS 学习计划

Your first step is to take the Diagnostic Test. This should be taken under test conditions: timed, quiet, without interruption. Identify areas of weakness using the cross-references to the Part 2 review. Use the review to strengthen your understanding of the concepts involved.

Ideally, you would start preparing for the test two to three months in advance. Each week, you would be able to take one Model Test, following the same procedure as for the Diagnostic Test. Depending on how well you do, it might take you anywhere between 15 minutes and an hour to complete the work after you take the test. Obviously, if you have less time to prepare, you would have to intensify your efforts to complete the six Model Tests, or do fewer of them.

The best way to use Part 2 of this book is as reference material. You should look through this material quickly before you take the model tests, just to get an idea of the range of topics covered and the level of detail. However, these parts of the book are more effectively used after you've taken and corrected a model test.

PART 1 第一部分

Diagnostic Test

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