

My two books are focused on SAT math. If you would also like to include basic math in your curriculum, then I can send you some ideas on that too.

For now, the first few pages of the two books, including TOC, are below.

Cheers!

Dr. Ela Sharma's

SAT Math

Manual and Workbook

For the Perfect Score

ISBN: 9798699545391

Published in the United States of America.

Copyright © 2021 Dr. Ela Sharma

All rights reserved.

Version 2.05

No part of this book may be reproduced or distributed in any forms or means, without the written permission of the author.

Volume discounts are available for schools, teachers, tutors, and learning agencies.

Email: tutorhubllc@gmail.com.

Additional resources and information on this book, including errata, are available at www.tutorhubllc.com.

*SAT is a registered trademark of the College Board, which is not affiliated in the publication of, and does not endorse this book.

About the book

To ace the SAT math sections, a student must know how to approach a question and solve it using the least number of steps. This book introduces students to over 1,000 SAT-type questions and covers all the required math areas. It is focused on demonstrating how to quickly solve questions on the SAT math sections using the shortest method (usually one to two steps).

There are 85 categories in this book that are divided into 15 sections. Each category is a question type on the SAT and contains a variety of practice questions on the question type. Key points in each category are the fundamentals required to solve the questions in that category.

The 850 practice questions varying from easy to hard and over 200 examples are based on the prior SAT tests. Answers to the practice questions are written to provide a detailed and a consistent solution that correlates with the steps in the examples.

A student who has diligently completed this book should be able to quickly solve several questions on the SAT math sections without calculation or by using mental math. View at the website which examples from this book can be solved using these techniques ([hyperlink available under the Book menu](#)).

How to use the book

Since each category is written to be independent, few key points are repeated across related categories. A student should understand how the key points in a category are used in the examples and apply them in the practice questions.

The mapping of each question on the math sections of the SAT Practice Test 10 released by the College Board to the categories in this book is available on the last page. Students could take this test and focus on the areas of improvement. However, students should keep in mind that the same question type could be presented in several ways on the SAT. Completing all the practice questions in the book is advised for the best score.

Students who are starting SAT math self-study are encouraged to start from the beginning of the book and take time to complete a category. This book will familiarize them with the math topics required for the test and the type of questions that appear on the test.

The “process of elimination” theme is utilized throughout the examples and answers in this book. It is a time saving approach that students are encouraged to utilize on the SAT.

About the author

Teaching, especially in mathematics, has been my passion since my teenage days. Over the course of years, I have helped many students achieve their target scores in SAT and ACT math sections. I have enjoyed every moment of writing this book. I wish good luck to all the students using this book to prepare for the SAT math sections!

Table of Contents

Commonly Used Terminology	7
Section 1 – Variables and Expressions in Linear Equations	8
Category 1 – Solving Variables and Expressions in Linear Equations.....	9
Section 2 – Lines and Linear Functions	13
Category 2 – Line Equation in Slope-Intercept Form.....	14
Category 3 – Line Equation in Standard Form.....	20
Category 4 – Points on a Line with Unknown Coordinates.....	23
Category 5 – Slope of Parallel Lines.....	25
Category 6 – Slope of Perpendicular Lines.....	27
Category 7 – Linear Functions.....	29
Category 8 – Graph Transformations of Linear Functions.....	32
Section 2 – Review Questions.....	35
Section 3 – System of Linear Equations and Inequalities	39
Category 9 – System of Linear Equations and Number of Solutions.....	40
Category 10 – System of Linear Equations with No Solution.....	43
Category 11 – System of Linear Equations with Infinite Solutions.....	45
Category 12 – System of Linear Equations with One Solution.....	47
Category 13 – System of Linear Inequalities.....	50
Category 14 – Solutions of Linear Expressions.....	54
Section 3 – Review Questions.....	57
Section 4 – Word Problems on Linear Equations and Inequalities	60
Category 15 – Word Problems on Linear Equations with One Variable.....	61
Category 16 – Word Problems on Linear Equations with Two Variables.....	65
Category 17 – Word Problems on Interpretation of Linear Equations.....	67
Category 18 – Word Problems on Linear System of Equations.....	70
Category 19 – Word Problems on Linear Inequalities.....	75
Category 20 – Word Problems on Linear System of Inequalities.....	78
Category 21 – Word Problems on Equal Variables in Linear Equations.....	81
Section 4 – Review Questions.....	84
Section 5 – Polynomial and Undefined Functions	88
Category 22 – Polynomial Functions as Equations.....	89
Category 23 – Polynomial Functions as Tables and Graphs.....	91
Category 24 – Polynomial Function within a Function.....	94
Category 25 – Polynomial Functions and Zeros.....	96
Category 26 – Remainder in Polynomial Functions.....	99
Category 27 – Undefined Functions.....	101
Section 5 – Review Questions.....	103

Section 6 – Quadratic Equations and Parabola	106
Category 28 – Quadratic Equations and Factors.....	107
Category 29 – Quadratic Equations and Number of Roots.....	109
Category 30 – Sum and Product of Quadratic Roots.....	111
Category 31 – Standard Form Equation of a Parabola.....	113
Category 32 – Vertex Form Equation of a Parabola.....	118
Category 33 – Factored Form Equation of a Parabola.....	122
Category 34 – Equivalent Standard Form and Vertex Form Equations.....	124
Category 35 – Parabola Intersections and System of Equations.....	126
Category 36 – Graph Transformations of a Parabola.....	129
Category 37 – Solutions of Quadratic Expressions.....	132
Section 6 – Review Questions.....	135
Section 7 – Absolute Value	139
Category 38 – Absolute Value and Linear Equations.....	140
Category 39 – Absolute Value and Linear Inequalities.....	143
Category 40 – Absolute Value and Functions.....	146
Section 7 – Review Questions.....	150
Section 8 – Ratio, Proportion, and Rate	152
Category 41 – Ratio and Proportion.....	153
Category 42 – Rate.....	158
Section 8 – Review Questions.....	162
Section 9 – Percent	164
Category 43 – Percent of a Number and Percent Increase/Decrease.....	165
Category 44 – The Original Number before a Percent Increase/Decrease.....	169
Category 45 – A Number Percent of Another Number.....	171
Category 46 – Percent Change.....	173
Section 9 – Review Questions.....	175
Section 10 – Exponents and Exponential Functions	177
Category 47 – Exponents.....	178
Category 48 – Linear Versus Exponential Growth and Decay.....	182
Category 49 – Exponential Growth and Decay.....	184
Category 50 – Graphs of Exponential Growth and Decay Functions.....	188
Section 10 – Review Questions.....	190
Section 11 – Manipulating Expressions and Equations	192
Category 51 – Fractions with Expressions in the Denominator.....	193
Category 52 – Rearranging Variables in an Equation.....	196
Category 53 – Combining Like Terms.....	199
Category 54 – Expressions with Square Root.....	200
Section 11 – Review Questions.....	203

Section 12 – Data Analysis and Interpretation	205
Category 55 – Probability.....	206
Category 56 – Graphs with Line Segments and Curves.....	210
Category 57 – Scatter Plots and Line of Best Fit.....	215
Category 58 – Bar Graphs.....	220
Category 59 – Histograms and Dot Plots.....	224
Category 60 – Mean.....	228
Category 61 – Histograms, Dot Plots, and Mean.....	231
Category 62 – Median.....	234
Category 63 – Histograms, Dot Plots, Bar Graphs, and Median.....	237
Category 64 – Box Plots and Median.....	241
Category 65 – Mode.....	245
Category 66 – Standard Deviation and Range.....	247
Category 67 – Comparing Mean, Median, Mode, SD, and Range.....	249
Category 68 – Interpretation of Sample Data in Studies and Surveys.....	253
Section 12 – Review Questions.....	257
Section 13 – Geometry	264
Category 69 – Area and Angles of a Circle.....	265
Category 70 – Circumference and Arc of a Circle.....	270
Category 71 – Equation of a Circle.....	273
Category 72 – Parallel and Intersecting Lines.....	276
Category 73 – Polygons.....	280
Category 74 – Angles, Sides, and Area of a Triangle.....	283
Category 75 – Similar Triangles.....	289
Category 76 – Squares and Cubes.....	292
Category 77 – Rectangles and Right Rectangular Prisms.....	294
Category 78 – Trapezoids and Parallelograms.....	296
Category 79 – Volume of Cylinders, Spheres, Cones, Pyramids, Prisms.....	298
Category 80 – Combined Geometric Figures.....	302
Category 81 – Geometric Shapes in the xy -plane.....	307
Category 82 – Geometric Shapes and Percent.....	309
Section 13 – Review Questions.....	311
Section 14 – Trigonometry	315
Category 83 – Right Triangles and Trigonometry.....	316
Category 84 – Unit Circle and Trigonometry.....	322
Section 15 – Complex Numbers	324
Category 85 – Complex Numbers.....	325
Answers	329
Mapping of Categories to SAT Practice Test 10 Math Sections	420

SAT Math

5 Practice Tests + Refresher Course

2022 - 2023

First Edition

ISBN: 9798840167762

Published in the United States of America.

Copyright © 2022 Dr. Ela Sharma

All rights reserved.

Version 1.0

No part of this book may be reproduced or distributed in any forms or means, without the written permission of the author.

Email: tutorhubllc@gmail.com.

*SAT is a registered trademark of the College Board, which is not affiliated in the publication of, and does not endorse this book.

About this book

This book is a quick course to prepare for the SAT math in a week or two. It contains two sections.

- A Refresher Course that covers the required math areas.
- A Practice Test section that contains five full length SAT math section 3 and section 4 tests.

The Refresher Course is a synopsis of the required math areas and is arranged in 27 sections. Each section contains the fundamentals required to answer questions in that math area. Most sections contain few examples of the questions that can be solved using mental math or do not require calculation. It is recommended that a student go through the 27 sections before taking the SAT math practice tests.

The 5 SAT Math Practice Tests follow the same format as on the real SAT math sections 3 and 4 and are up to date with the recent SAT tests. Answer solutions are given at the end of each practice test. Each answer solution explicitly mentions the questions that can be solved using mental math or do not require calculation.

An answer sheet is given for each practice test. A student can carefully cut it out.

After completing the five practice tests, a student will see familiar questions on the real SAT test. This should increase “the comfort level” and alleviate one of the main factors for not doing as well as a student could have done, “the anxiety”.

Mental math

To win the SAT math sections, a student should know how to speed through the questions on the test and have enough time left for the questions that are challenging to the student. This book shows how several questions can be quickly solved using mental math or may require no calculation at all.

Mental math may not be for all. However, after repeated demonstration and application, one can develop an aptitude for it or, at the very least, pick up some of the tips. Even the questions that appear challenging could be solved using the method shown in the answer solutions.

Students not comfortable with mental math may choose not to apply it.

Disclaimers:

This book is for quick SAT math prep. For a thorough study and a perfect score, please see the book on the next page.

The author does not guarantee success with mental math for every user of this book.

The practice tests are in a book as opposed to separated pages as on a real SAT test. If you are comfortable removing pages from the book, you can carefully cut the pages for each test and mimic the real SAT test environment.

Answer sheets are created by the author of this book. Best effort has been put to closely mimic the real answer sheets.

Table of Contents

Refresher Course	7
Commonly Used Terminology and Concepts.....	9
Section 1 – Solving Linear Equations and Expressions.....	11
Section 2 – Lines and Linear Functions.....	12
Section 3 – System of Linear Equations.....	14
Section 4 – Linear Inequalities and System of Linear Inequalities.....	15
Section 5 – Word Problems on Linear Equations and Inequalities.....	16
Section 6 – Polynomial Functions.....	17
Section 7 – Quadratic Equations and Parabola.....	18
Section 8 – Number of Solutions of Polynomial Expressions.....	20
Section 9 – Absolute Value.....	21
Section 10 – Ratio, Fraction, Proportion, and Rate.....	22
Section 11 – Percentage.....	23
Section 12 – Exponents.....	24
Section 13 – Exponential Growth and Decay.....	25
Section 14 – Manipulating Expressions and Equations.....	27
Section 15 – Probability.....	28
Section 16 – Reading Graphs.....	29
Section 17 – Histograms, Bar Graphs, and Dot Plots.....	31
Section 18 – Mean, Median, Mode, Range, and Standard Deviation	32
Section 19 – Median and Range in Box Plots.....	34
Section 20 – Studies and Data Interpretation.....	35
Section 21 – Circles.....	36
Section 22 – Lines and Angles.....	38
Section 23 – Triangles.....	39
Section 24 – Quadrilaterals.....	41
Section 25 – Three-Dimensional Figures.....	42
Section 26 – Trigonometry.....	43
Section 27 – Complex Numbers.....	44

SAT Math Practice Tests	45
SAT Math Practice Test 1.....	47
Answers to SAT Math Practice Test 1.....	68
SAT Math Practice Test 2.....	71
Answers to SAT Math Practice Test 2.....	92
SAT Math Practice Test 3.....	95
Answers to SAT Math Practice Test 3.....	116
SAT Math Practice Test 4.....	119
Answers to SAT Math Practice Test 4.....	140
SAT Math Practice Test 5.....	143
Answers to SAT Math Practice Test 5.....	164
Answers Sheet for Practice Test 1.....	167
Answers Sheet for Practice Test 2.....	169
Answers Sheet for Practice Test 3.....	171
Answers Sheet for Practice Test 4.....	173
Answers Sheet for Practice Test 5.....	175