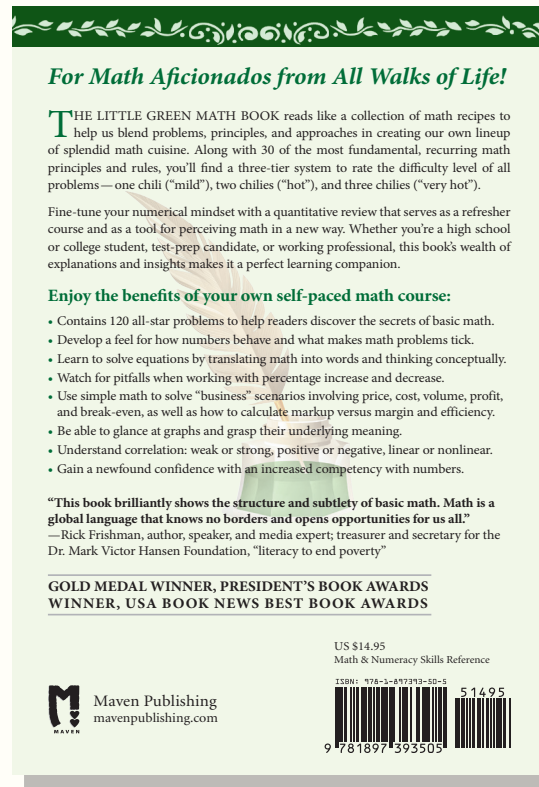
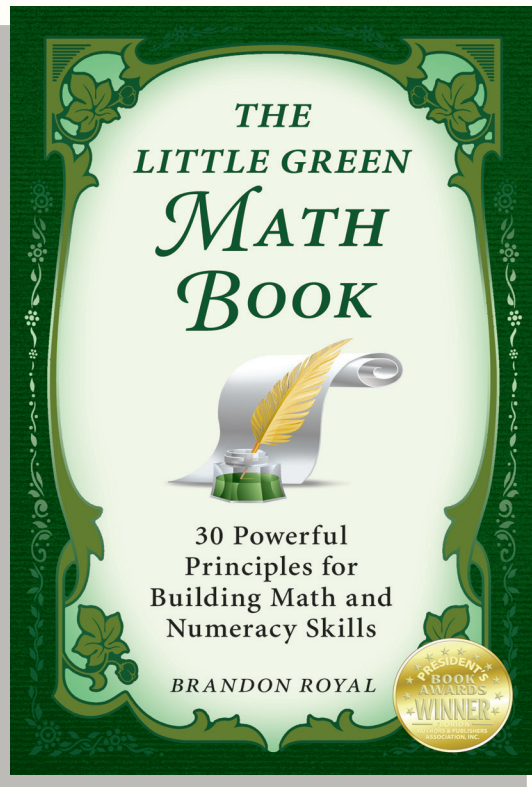


The Little Green Math Book

30 Powerful Principles for Building Math and Numeracy Skills



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FOR MATH AFICIONADOS FROM ALL WALKS OF LIFE!

The Little Green Math Book reads like a collection of math recipes to help us blend problems, principles, and approaches in creating our own lineup of splendid math cuisine. The book's four chapters include: (1) Basic Numeracy Ingredients, (2) Wonderful Math Recipes, (3) Favorite Numeracy Dishes, and (4) Special Math Garnishments. Along with 30 of the most fundamental, recurring math principles and rules, you'll find a three-tier system to rate the difficulty level of all 120 problems – one chili ("mild"), two chilies ("hot"), and three chilies ("very hot").

Fine-tune your numerical mindset with a quantitative review that serves as a refresher course and as a tool for perceiving math in a new way. Whether you're a high school or college student, test-prep candidate, or working professional, this book's wealth of explanations and insights makes it a perfect learning companion.

About the Author: Brandon Royal (CPA, MBA) is an award-winning writer whose educational authorship includes *The Little Blue Reasoning Book*, *The Little Red Writing Book*, *The Little Gold Grammar Book*, and *The Little Purple Probability Book*. During his tenure working in Hong Kong for US-based Kaplan Educational Centers—a Washington Post subsidiary and the largest test-preparation organization in the world—he honed his theories of teaching and education and developed a set of key learning "principles" to help define the basics of writing, grammar, math, and reasoning. Brandon has been a winner at the International Book Awards, a gold medalist at the President's Book Awards, and a recipient of the "Educational Book of the Year" award as presented by the Book Publishers Association of Alberta. He continues to write and publish in the belief that there will always be a place for books that inspire, enlighten, and enrich.

Sample Pages from *The Little Green Math Book*

THE LITTLE GREEN MATH BOOK



30 Powerful Principles for Building Math and Numeracy Skills

REVISED EDITION

BRANDON ROYAL



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Introduction

The primary goal of this book is to help readers develop those thinking skills that are essential for mastering basic math, and to do so in the shortest possible time frame. Such thinking skills are closely aligned with numeracy skills. The person who is numerate grasps the "how" and "why" of problem solving. He or she has a fluency with numbers and is much more likely to approach problems solving in a conceptual way with an understanding of the key math principles involved. Numeracy is more than performing calculations accurately; it combines the science of math with the art of numbers.

The Little Green Math Book provides a compilation of the most useful academic and middle math concepts. The secret recipe used in preparing material for this book is a blend of classic problems and relevant tips. Classic problems are recurring, value-added problems which give you, the reader, maximum return for your time and effort spent. Tips serve as math principles; they represent the themes that bind categories of related problems. In addition to presenting 120 classic problems and introducing 30 tips, this book lends a three-tier chili rating system to help readers gauge the difficulty level of a given problem is "mild," "medium spicy," "hot," and "three chilies signal" "very hot."

Good math, like good cuisine, starts with good ingredients. Chapter 1: Basic Numeracy Ingredients highlights the importance of reviewing the basic building blocks of math, which lie at the foundation of superior problem-solving skills. With these skills come the knowledge and confidence to easily answer the following questions: What are the five different percentage formulas as they relate to percentage increase and decrease? What pitfalls exist in working with ratios and proportions? Does the order of mathematical operations really matter? How do we know if two variables vary directly or indirectly or proportionally?

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Chapter 1 Basic Numeracy Ingredients



Math class is tough.
—Punchie's original voice
chip by Mattel

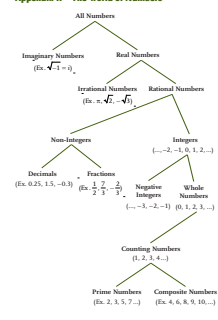
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The Four Basic Operations

The four basic arithmetic operations are addition, subtraction, multiplication, and division. The results of these operations are called sum, difference, product, and quotient, respectively. Two additional operations involve exponents and radicals.

Addition	Subtraction
$2 + 3 = 5$ 2 is added 3 is added 5 is sum	$5 - 2 = 3$ 5 is minuend 2 is subtrahend 3 is difference
Multiplication	Division
$3 \times 4 = 12$ 3 is multiplicand 4 is multiplier 12 is product	$12 \div 3 = 4$ 12 is dividend 3 is divisor 4 is quotient
Exponents	Radicals
$2^3 = 8$ 2 is base 3 is power 8 is result	$\sqrt{16} = 4$ 16 is radicand 4 is radical 4 is root

Appendix II – The World of Numbers



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Step #2: Total the numbers on the side and bottom of the matrix.

	Blond Hair	Non Blond Hair
Blue Eyes	45%	65%
Non Blue Eyes	?	35%
	75%	100%

Step #3: Since data must total down and across, we simply fill in remaining numbers within the middle four boxes.

boxes.

	Blond Hair	Non Blond Hair	
Blue Eyes	45%	20%	65%
Non Blue Eyes	30%	5%	35%
	75%	25%	100%

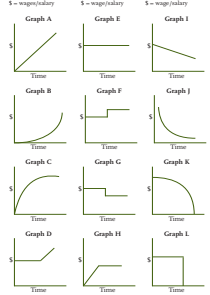
54. Singles

Choice D: Two-thirds of the women are single (that is, $\frac{2}{3} \times \frac{3}{4} = \frac{1}{2}$). For this problem, assume for simplicity's sake that there are 100 students in the course and fill in the given information, turning percentages into numbers. If 70% of the students are male then 10% must be female. If we assume there are 100 students then 70 are male and 30 are female. Note that if two-sevenths of the male students are married, then 20 male students are married; that is, two-sevenths of 70 male students equals 20 students.

Special Math Commitments • 115

EXHIBIT 4.1 BASIC GRAPHS

Being Graphs (A,B,C,D) Flat Graphs (E,F,G,H) Falling Graphs (I,J,K,L)



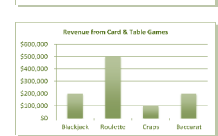
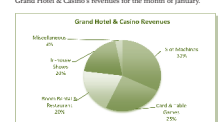
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EXHIBIT 2.1 PERFORMANCE OF SALESPERSONS

	Technical skills and product knowledge	People skills and ability to communicate	Track record and ability to get things done
Albert	2	3	7
Betty	5	2	6
George	6	5	9
Jed	3	7	1
Joan	8	10	3
Martha	10	1	2
Patricia	1	4	8
Randy	9	9	4
Solomon	4	6	10
William	7	8	5

Special Math Commitments • 115

Use the following two graphs to answer questions 80–81 regarding Grand Hotel & Casino's revenues for the month of January.



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Coffee #1	Coffee #2	Final Blend
20	x	20 + x
\$7.50	\$15.00	\$12.00
\$7.50(20)	\$15.00(x)	\$12.00(20 + x)

$$7.50(20) + 15.00(x) = 12.00(20 + x)$$

$$150 + 15.00x = 240 + 12.00x$$

$$15.00x - 12.00x = 240 - 150$$

$$3.00x = 90$$

$$x = 30 \text{ pounds}$$

(Note: Dollar signs cancel)

59. Nuts

Choice A: This is a dry minutes. We need to calculate the amounts of nuts different nut mixtures to arrive at a final mixture.

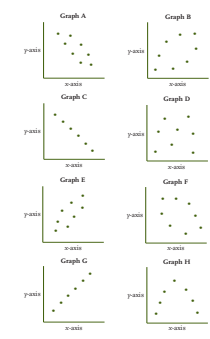
Cashews	Peanuts	Final Mix
x	100 - x	100
\$4.00	\$1.50	\$2.50
\$4.00(x)	\$1.50(100 - x)	\$2.50(100)

$$4.00(x) + 1.50(100 - x) = 2.50(100)$$

$$4.00x + 150 - 1.50x = 250$$

$$2.50x = 100$$

$$x = 40$$



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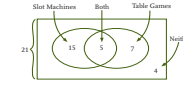
Two-Groups Formula	Solve
Add: Members in Group A	x
Add: Members in Group B	x
Less: Both	<x>
Add: Total	2x

In Las Vegas, 21 tourists were surveyed, and it was found that 15 of these people liked to play the slot machines and 7 people liked to play table games with a blackjack. Only 4 people surveyed and they played neither slot machines nor table games. How many people surveyed played both slot machines and table games?

Two-Groups Formula	Solve
Add: Slot Machines	15
Add: Table Games	7
Less: Neither	4
Add: Total	18

Answer: Five people played both slot machines and table games.

Here is the visual representation of the Las Vegas scenario.



Answers and Explanations • 217

Calculation:

$$B + M + P + BM + BP + MP + BMP + None = Total$$

$$45 + 30 + 27 + 15 + 15 + 8 + 10 + x = 217$$

$$x = 80$$

The Venn-diagram approach is highly analytical and requires breaking the problem down into non-overlapping areas while finding individual values for all seven areas. That's right—seven distinct areas are created when these groups overlap.

$$27 + 15 + 12 + 10 + 7 + 3 + 5 = 80$$

BMW only: Mercedes only: Porsche only: (BMW & Mercedes) – (Mercedes & Porsche) – (BMW & Porsche) = (BMW & Mercedes & Porsche).

