

# PRAISE for the **Algebra Survival Guide**

## LEADING JOURNALS SAY ...

"We give the **Algebra Survival Guide** our highest Four-Star 'Awesome!' Rating. The author did a great job with this book ... and the illustrations are excellent."

— *The Washington Times*

"The **Algebra Survival Guide** is a non-threatening first-year algebra tutorial guide ... The question-and answer format is great, and the questions actually sound as if they are being asked by eighth or ninth graders ... Teachers and tutors will find that the questions are typical, and the answers are complete."

— *Mathematics Teacher*, a publication of the National Council of Teachers of Mathematics

"This book will teach algebra to anyone who unleashes its power — especially daunted parents and weary teachers."

— *Northwest Family Magazine*

"Now there is a tool available to help parents and students decipher the difficult aspects of basic algebra: the **Algebra Survival Guide**."

— *Charlotte Parent Magazine*

"The **Algebra Survival Guide** is fun to handle and stunning to read ... It is a friendly book that de-mystifies algebra, and — believe it or not — even makes it fun."

— *Kern County Family Magazine*

"A perfect tool for those who are lost in 'Algebra Land.' I would recommend the **Survival Guide** not just for your children who are studying algebra, but also for those parents who will be teaching it shortly."

— *Crusader News*, an online educational newsletter

"Breaks down the barriers that regular algebra textbooks inadvertently put up."

— *The Albuquerque Journal*

"The **Algebra Survival Guide** offers hope to students of all ages who are having trouble grasping the abstract world of algebra."

— *The Saint John's Reporter*

"If you've got a nervous algebra student ... consider acquiring a copy of this reassuring self-teaching text ... delivered with a sense of humor, which is definitely rare in algebraic circles."

— *Home Education Magazine*

"A clear exposition of all the materials in an Algebra 1 course. Works well as a supplement/review to other math materials ... and as a stand-alone alternative to those with a distaste for any math textbook."

— *John Holt's Bookstore*, a catalog of educational products

## EDUCATORS SAY ...

"The girls in my school are using the **Guide** because it helps them understand algebra and feel confident. I would definitely say that the format of the guide has helped these girls overcome their anxiety about math."

— Sarah Pearce, Directress, Milwaukee Montessori School

"Delightful self-paced book that is sure to help those with math anxiety!"

— Linda Day, Ph.D., Director of the UNM / Santa Fe Public Schools Teacher Education Program

"The **Algebra Survival Guide** is SUPERB! It is a wonderful tool that speaks to the students in a language they can understand. I've already asked my school to order copies for our library."

— Mary Gambrel, 7th grade regular and honors math teacher at Travis Middle School, Amarillo, Texas

"Everything you always wanted to know about algebra -- and MORE -- written in a style that anyone can understand. I recommend this book to teachers, students and parents."

— Eleanor Ortiz, President of the New Mexico State Board of Education, and one-time algebra teacher herself

"The **Algebra Survival Guide** is excellent! I've always been a supporter of the idea that math doesn't need to be boring and is quite practical in everyday life. The **Survival Guide** exemplifies this idea with its unconventional flavor."

— Jill Miller, tutor, Harrisburg, Pennsylvania

"I like the book so much that at parents night I copied the book's order form and gave it out to all the parents of my students."

— Linda Barkley, math teacher, Sacred Heart School, Dearborn, Michigan

### PARENTS SAY ...

"Yes! I bought the **Algebra Survival Guide** to help my public schooled daughter to help with concept review for SATs, but it really helped me too! I plan to use it for my other daughter too!"

— Becky Fisher in Delaware

"Wow! After years and years of trying in public school, the **Algebra Survival Guide** has taught my math-phobic 16-year-old daughter, now homeschooled, to do algebra."

— Karen Grawe, homeschooling mother

"Your **Algebra Survival Guide** has been a godsend for someone trying to understand algebra!"

— Sue Conant, Adelanto, California

"This book is fantastic. I was going over it with my daughter last night, and for the first time in my life I understood absolute value."

— Rob Steinmetz, Ph.D., President, Learning System Sciences, a company that manufactures educational CD-ROMS

### STUDENTS SAY ...

"Kids could learn math without a teacher using this book!"

— Celeste Due, soon-to-be-famous 12th grader, Santa Fe, New Mexico

"I would definitely tell friends about the **Algebra Survival Guide** because if they're having a much trouble as I've had, I know they'd benefit from it as much as I did."

— Nick Fabin, 9th grader at the Colorado Rocky Mountain School, Carbondale, Colorado

"I want to thank you because my school just loves your book! I have switched over from my old textbook to the **Algebra Survival Guide**, and now my friends are going to do it too."

— Alia Trillegi, 8th grader at Milwaukee Montessori

"The **Survival Guide** is wonderful. It is informative and easy-to-grasp. I only wish I'd had it three months ago — when the semester started!"

— Christopher McDonal, Flagstaff, Arizona

"This book helped me get over my dread of math so I could pass the GRE. Thank goodness for it!"

— Ann Marie Fitzgerald, graduate student in nursing, Albuquerque, New Mexico

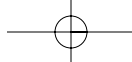
# **Algebra Survival Guide**

**A Conversational Handbook  
for the Thoroughly Befuddled**



**Written by Josh Rappaport  
Illustrated by Sally Blakemore**

**Singing Turtle Press  
Santa Fe, New Mexico**



# **Algebra Survival Guide**

## **A Conversation Handbook for the Thoroughly Befuddled**

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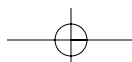
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Or call our toll-free ordering number: 1/888-308-MATH



# Note from the Author

Tutoring brings me many rewards. It gives me the joy of working with students and watching them learn. Tutoring also rewards me, interestingly enough, by offering me an in-depth look at the confusion students face. Most of my students, once over their initial anxiety (who is this guy, and will he laugh at me?), become quite willing to confess their confusion to me. In this book, I've tried to recycle this confusion to help students learn. For in the **Algebra Survival Guide** I use the very questions students have asked me about algebra, and then I offer the best answers that I've found during my years of teaching and tutoring. In doing so, I've tried to develop a self-teaching program that students can follow easily.

As I see it, the **Algebra Survival Guide** is an **Algebra I reference book — PLUS**. It's more **comprehensive** than a typical algebra reference book, and it's also (I hope) more **clear, conversational, user-friendly** and **fun**. (It also is written in accord with national standards. For details, see the note on **NCTM Standards** in the **Supplies** section.)

To help students succeed, the **Guide** includes **QuikChek practice problems** after nearly every new idea, no matter how minute the concept. This is because, from my vantage point, 95% of students' confusion in algebra stems from a simple fact: they're overwhelmed. In tutoring I've found that whenever I can break algebraic ideas and procedures into mini-steps, students experience success. This success helps students "stay in the saddle" as concepts become tougher. These **QuikChek** problems give students the chance to experience success on nearly every page.

Here are some ways that the **Algebra Survival Guide** can help your student(s).

First, students can use the **Guide** to **learn how to perform essential algebraic operations**. Example: let's say that despite teacher and textbook, a student can't figure out how to eliminate negative exponents from answers. S/he can go to the index, locate the pages on negative exponents and do the **QuikChek** problems on that topic. The **Guide's** careful, step-by-step instructions teach students how to master difficult Algebra I operations.

Secondly, students may use the **Guide** to **deepen their understanding** of a concept. Suppose, for example, that after a lesson on the neighbor-sign rule a student knows that  $7 - - 2$  can be re-written as  $7 + 2$ , but hasn't a clue as to why. Solution: look up the neighbor-sign rule in the index and study up on it. The **explanation and cartoons** help students grasp the **why** by connecting algebraic ideas to everyday life.

Thirdly, students can use the **Guide** like a regular textbook in the sense that it's **arranged sequentially**. Starting at the beginning of the book and working through to the end, students will gain a **thorough grasp** of Algebra I concepts and operations. And keep in mind that students often have algebraic amnesia after a year of geometry, so don't toss the **Guide**. It can serve as a **refresher course** — to help students brush up on Algebra I before entering Algebra II ... or before taking college entrance exams.

Finally, use the **Guide** to let students have **fun** with math. Before plunging into a new concept, encourage students to play the **"Bored" Game** to review previously learned concepts. Or use the **Guide** to engage them **creatively**. For example, you might challenge an artistic student to make cartoons -- like those in the book -- to explain a concept s/he has recently mastered. I'd be honored if you send me any creative extensions on how you use the **Guide**. (Contact me through my publisher, Singing Turtle Press. See ways to contact Singing Turtle on back of title page.)

Josh Rappaport  
Santa Fe, New Mexico

## ACKNOWLEDGMENTS

The **Algebra Survival Guide** was created as much through dialogue as through my own effort. In that light, I must first thank the hundreds of children I've had the pleasure to tutor over the past ten years. It's through their quest to learn that this book grew. Among the adults who played a role in creating the **Algebra Survival Guide**, I first thank my wife, Kathy, a gifted and creative teacher, who offered invaluable feedback and urged me to always keep the befuddled student foremost in mind. Second, I owe a huge debt of gratitude to Sally Blakemore, who not only created the illustrations and developed the book's overall design, but also provided humor, support and inspiration each step of the way. I also wish to thank my production staff: David Cox, Byron Grush, Janice St. Marie and Madeleine Tillin. Teachers who offered peer critiques are: Michael Carroll, Lucille Cueva, Marilyn Gardner, Debbie Gibbs, Peter Graham and May Hackler. Other adults who offered help in various ways are: Seymour Bortz, Martin Casdagli, Janet Dennison, MacDonnell Gordon, Barbara Holmes, Ann Lacy, Sarah Oberstein, Ann Pagliarulo, Phyllis Panzeter, Mary Schenck and Sam Shaffer. Finally, thanks to three students who offered particularly in-depth suggestions: Phillip Holmes, Katie Kelley and Laura Schenck.

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### Warning / Disclaimer

Although the author and publisher have conducted exhaustive research to ensure the accuracy of the information contained in this book, we assume no responsibility for errors, inaccuracies, omissions or any other inconsistency herein. Readers should use all resources at their disposal to aid them in teaching or learning algebra and other subjects.

The purpose of this guidebook is to educate and entertain. The author and Singing Turtle Press shall have neither liability nor responsibility to any person or entity with respect to any loss or damage caused, or alleged to be caused, directly or indirectly, by the information contained in this book.

If you do not wish to be bound by the above, you may return this book to the publisher for a full refund.

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## EMERGENCY FACT SHEET POSTER

### **Algebra Wilderness "Bored" Game**

**Hello and  
welcome!**

**You're trapped in a classroom.**  
People are talking in what seems to be a  
foreign language.

Gibberish about exponents, variables,  
monomials, the Pythagorean theorem.

They expect you to "get it". And there's  
a test on all this stuff tomorrow! You are in  
danger of perishing at your very desk.

It's only a matter of time...

Thank goodness you just discovered  
the **Algebra Survival Guide**.

This guide, written by someone who, long  
ago, barely crawled out of the **Algebra  
Wilderness** alive, will help you find your  
way through this perilous territory.

But now that you have the **Guide**,  
how do you use it?

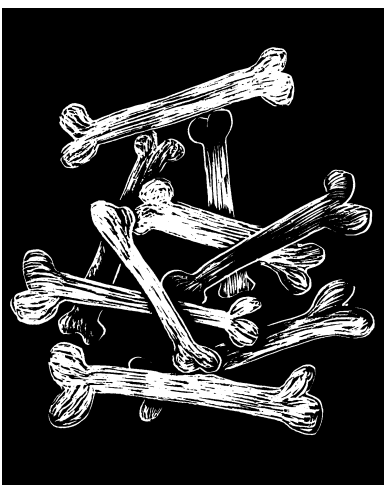
**Just flip the page to find out!**

**▲ The Guide contains five kinds of pages, along with regular QuikChek problems:**



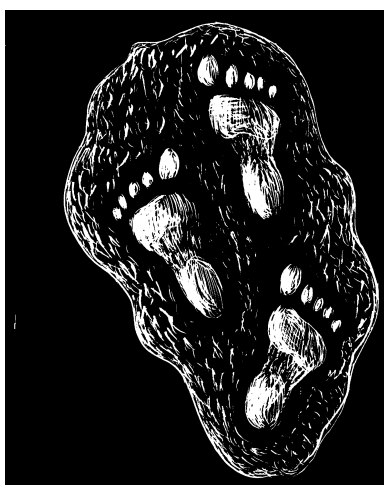
**Mind Munchies** pages give you “food for thought,” to help you make sense of algebraic ideas.

**Pitfall** pages teach you misunderstandings and mistakes to avoid.



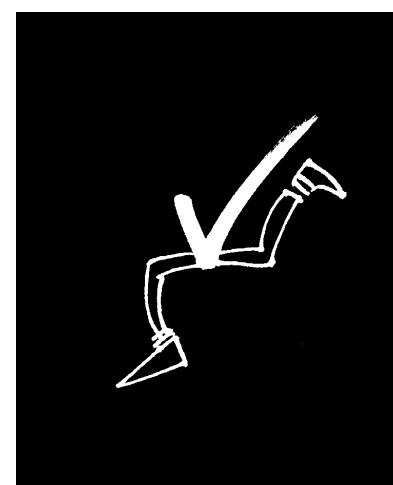
**Bare Bones** pages present basic information you’ll want to memorize cold.

**Target Practice** pages let you test your understanding by working out practice problems.




**Step by Step** pages show how to perform the steps for algebraic operations. These pages also illustrate those steps with an example.

**QuikChek** problems give you a chance to check your grasp of the concept just taught.



## How is the **Guide** organized?

 Since you never know what you may run across in the **algebra wilderness**, the **Algebra Survival Guide** is equipped for any emergency. First, it's organized into **12 content sections**, which provide detailed instruction on: Properties; Sets of Numbers; Positive & Negative Numbers; Order of Operations & Like Terms; Absolute Value; Exponents; Radicals; Factoring; Cancelling; Equations; the Coordinate Plane; and Word Problems.

Here are four specific ways you'll use the **Guide**:

**1) as a quick reference guide** — Whenever you're puzzled by a large topic — for example, "factoring" — just flip to that section and dig in for information. The **index** and **glossary** help you learn about specific concepts — for example, "irrational numbers" — in a flash.

**2) as a memorization tool** — Since you need loads of info to survive your trek through the wilderness, the kit provides info in an easy-to-learn format. Both the **Bare Bones** and **Step by Step** pages have information you can and should **memorize**. Also, the **Emergency Fact Sheet** lets you see the rules of algebra at a glance.

**3) as a self-teaching program** — By reading any section carefully, you'll get a thorough overview of that particular topic. In addition, working out the **QuikChek** problems (at bottom of most pages) will tell you whether or not you're on the right track. For a more comprehensive check-up, do the **Target Practice** problems at the end of each section.

**4) as your survival buddy** — The **Pitfall** pages show you **common mistakes** students make and **common misunderstandings** they have. Study these to avoid a perilous fall down the grade ladder.

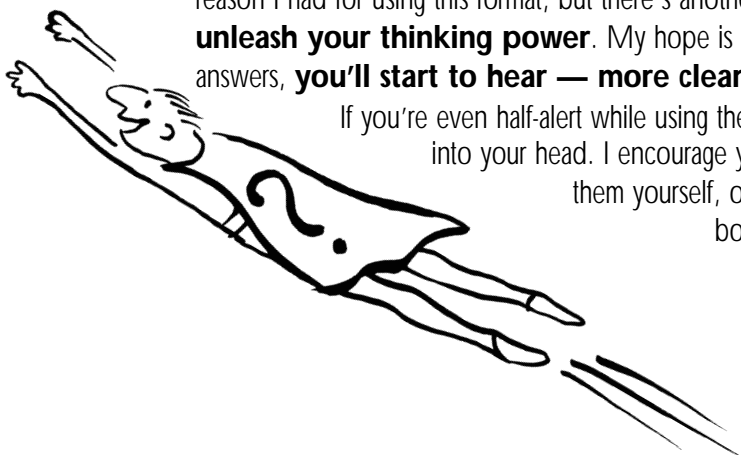
## Why is the **Guide** set up in a question-and-answer format?

 **Good question. Here are a few reasons ...**

First of all, math has always evolved in this very way — through a question-and-answer process. Reading math textbooks, many people get the **wrong idea** that some brilliant person somewhere just thought up all this stuff and wrote it down. **Not at all!** People developed math in a human way — by asking questions, then looking for answers. The answers people found led to still more questions, which led to more answers, and over time, a whole branch of math, such as algebra, was woven — like a beautiful tapestry of thought.


In this book, questions are meant to be in your voice; answers, in the voice of a friendly teacher. By reading through both, you experience the question-answer process that gives birth to math. That's one reason I had for using this format, but there's another one too. Using the question-answer process helps **unleash your thinking power**. My hope is that as you read through all these questions and answers, **you'll start to hear — more clearly — your own questions about math**.

If you're even half-alert while using the **Survival Guide**, questions about math will pop into your head. I encourage you to **jot down your questions**. Try to answer them yourself, or work on them with a friend. If you get stuck, see if the book speaks to the question. If not, ask someone for help. But most of all, treasure your questions. For they give you the power to learn.





## What else does the **Guide** provide? And, just out of curiosity, can I contact the author?

 First, the **Guide** has an introductory section called, **What is algebra?** This gives you a sense of what algebra covers, why you're learning it, and how you'll benefit by studying it.

At the very back is the **Supplies** section, which contains:

- a **Glossary** with quick-and-easy definitions of algebra terms,
- a **Note** on how the **Guide** meets national math standards,
- a handy **Order Form**,
- and an **Index** (conveniently located on the last page) to help you locate any concept in the **Guide**.

At the very back of the **Supplies** section you'll discover a special poster. The first three panels of the poster make up the **Emergency Fact Sheet**, which displays all the rules of Algebra I on a sheet you can post up or tuck into your notebook.

The last two panels of the poster contain the **Algebra Wilderness "Bored" Game**, which gives you a fun way to practice your lessons. The rules for playing this exciting board game are included on a special page in the **Supplies**.

And yes, you can reach me courtesy of **Singing Turtle Press** (see ways to reach my publisher on back of title page). And here's a fun challenge: find a stupendously brilliant and creative way to explain some algebraic concept, then send it my way. If I like it a lot, I'll print it in the next edition along with an acknowledgment of your name. Looking forward to hearing from you.



**Josh Rappaport**  
your guide