Pearson's Prentice Hall "Classics" Series

Textbooks by
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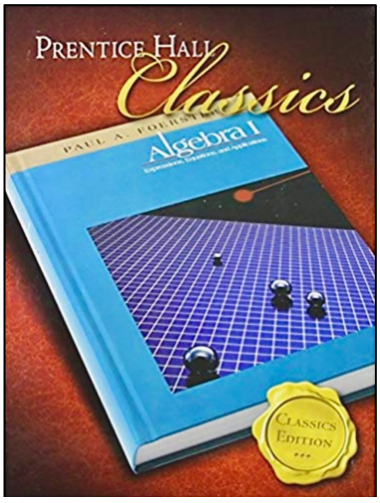
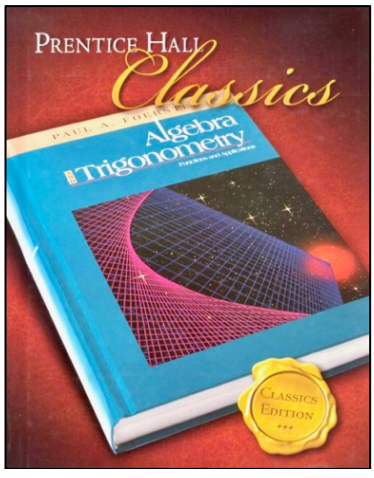


Algebra 1: Expressions, Equations, and Applications
S.E.: ISBN 9780131657083
T.E.: ISBN 9780131657090



Algebra and Trigonometry: Functions and Applications
S.E.: ISBN 9780131657106
T.E.: ISBN 9780131657113

Algebra and Trigonometry Texts

Paul Foerster is a recipient (1983) from Ronald Reagan of a Presidential Award for Excellence in Mathematics and Science Teaching. His algebra texts, written during his 50 years of classroom teaching, convey mathematically correct structure in understandable ways that lead students to intelligent applications.

The 400+ named problems in each text embody the good mathematics of traditional word problems. In the "Airplane Flight Speed Problem," students expand "upstream-downstream" problems to analyze the effect on round-trip flight times as planes with various speeds fly with and against a prevailing wind. They experience the fact that variables can actually *vary,* not just stand for unknown constants. They are surprised by what happens when the flight speed is close to the wind speed.

Algebra 1: Expressions, Equations, and Applications lays the foundation for the two fundamental concepts of algebra, namely, for an expression with a variable, (1) given a value of the variable, evaluate the expression, and (2) given a value of the expression, solve for the value of the variable. All things students learn in Algebra 1 are done to enable these two tasks with expressions of increasing complexity.

For instance, in the Airplane Flight Speed Problem, above, the round-trip time involves a rational algebraic expression. Students evaluate the expression to find the round-trip times for various airplanes. In other problem parts, they solve for a flight speed that leads to a desired round-trip time. Topics are sequenced so that the quadratic formula appears by mid-year rather than being presented in a rush at the end of the year.

Algebra and Trigonometry: Functions and Applications continues the "variables really vary" theme from Algebra 1. Students use linear, polynomial, exponential, and other functions as mathematical models. Trigonometry is presented as a study of periodic functions. Sequences and series are functions with domain the counting numbers. Probability is a study of functions of a random variable. Proportional relationships can involve functions with more than one independent variable.

For instance, in the "Spike Heel Problem," the pressure exerted on the floor is directly proportional to the person's weight, and inversely proportional to the square of the shoe's heel width. Girls are stunned to find that a 100-pound person wearing a spike heel can exert 2000 pounds per square inch pressure on the floor. Paul's student Gail was so impressed by this problem that she decided to major in mathematics, became a junior high teacher, and was subsequently selected as Teacher of the Year in Georgia.

The payoff for learning that variables really vary comes in later courses. For instance, in calculus students learn how *fast* a variable varies. If they have learned only that variables are "answers you solve for," they face the task of learning an unfamiliar concept based on another unfamiliar concept.

(Other Side)

Teaching Resources Available from the Publisher

Go online to: www.savvas.com (formerly Prentice Hall)
Click on the "Search" icon at the top of the page.
Type: Foerster
Click on the "Products" icon, then on "Student Edition"
Clicking on any of the four brings up a menu for all.
Click on the "Shop" icon for more details.
Each text has:

- Student Edition
- Teacher's Edition
- Solution Manual
- Sample Tests

Teaching Resources Available from the Author

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Email: foerster@idworld.net

- Manuscript for a new edition of *Algebra/Trig* containing the 12 Algebra 2 chapters
- 209 Explorations, reproducible masters for the new Edition of *Algebra/Trig*
- 144 Explorations, reproducible masters for the present edition of Algebra 1

Information about the Explorations

The Explorations were written originally to introduce students, working in small groups, to a topic before your more formal classroom presentation. They are self-contained, with space for students to write their solutions. Each is on one page (occasionally both sides), minimizing the amount of paper needed to print. They can be used in "Guided Discovery" mode, where students are given, say, two minutes to work Problem 1. Then you discuss that problem before giving them a minute or so for Problem 2, and so forth. They can also be used for students working individually in "flipped-lesson" mode, or as the basis for your own classroom presentation. Some teachers have adapted the Explorations to the virtual learning mode.

More about the Author

Both texts are products of the author's 50 years of classroom teaching. His approach has been influenced by four years of school in England preceding his high school graduation at age 16, by his degrees in chemical engineering and mathematics, and by his four years in the Navy as an engineering duty officer with the design, construction, and testing of nuclear submarines.

Paul was fortunate to get in at the beginning of the nuclear power age when problems were being solved by going back to fundamental theory because no one had ever solved them before. As a result, he came to realize that a person must understand the theory in order to make intelligent applications.

Problems that appear in the texts were written "tonight to use tomorrow morning," allowing immediate student feedback for improvement. The narrative was written from copies of class notes students took while concepts were being "uncovered" in the classroom. As a result, his texts are mathematically correct, but written in language students, even the home-schooled, can understand.

The applications in the texts were chosen to illustrate the mathematical concepts being taught. As a result, the books are mathematics texts with applications, rather than applications texts with mathematics. The applications are "on tap," not "on top."