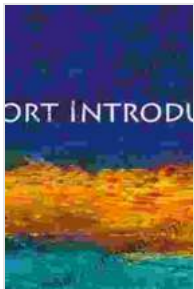


Algebra: A Comprehensive Introduction for Everyone

Algebra, a branch of mathematics that deals with the study of mathematical symbols and the rules for manipulating them, is a fundamental tool used in various fields of science, engineering, and everyday life. Our Very Short to Algebra provides a comprehensive overview of this essential mathematical discipline, making it accessible to anyone interested in gaining a deeper understanding of its concepts and applications.



Algebra: A Very Short Introduction (Very Short Introductions) by Peter M. Higgins

★★★★☆ 4.3 out of 5

Language	: English
File size	: 3190 KB
Text-to-Speech	: Enabled
Enhanced typesetting	: Enabled
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Lending	: Enabled
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Dimensions	: 6.14 x 0.81 x 9.21 inches
Screen Reader	: Supported



Chapter 1: The Basics of Algebra

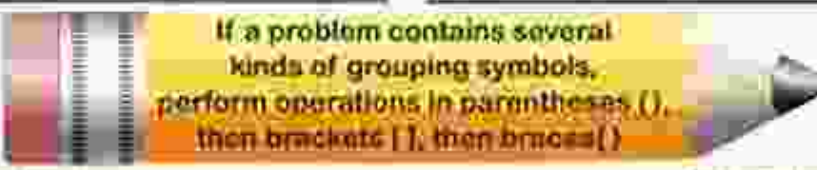
In this opening chapter, we lay the groundwork for understanding algebra. We explore the concept of variables, constants, and operations like addition, subtraction, multiplication, and division. We also introduce the

idea of algebraic expressions and equations, providing a solid foundation for further exploration.

EVALUATING ALGEBRAIC EXPRESSIONS

To evaluate an algebraic expression, replace each variable with its given value, and then perform the operation(s). Be sure to follow the order of operations. Here is how to evaluate the following expressions:

$4m + 3$ when $m = 7$ $4m + 3$ $= 4(7) + 3$ $= 28 + 3$ $= 31$	$6x - y$ when $x = 8$ and $y = -12$ $6x - y$ $= 6(8) - (-12)$ $= 48 + 12$ $= 60$
$7r^2 + 9r$ when $r = 5$ $7r^2 + 9r$ $= 7(-5)^2 + 9(-5)$ $= 7(25) - 45$ $= 175 - 45$ $= 130$	$y + x[6 + (4 - x)^2]$ when $x = 2$ and $y = -3$ $y + x[6 + (4 - x)^2]$ $= -3 + 2[6 + (4 - 2)^2]$ $= -3 + 2[6 + (2)^2]$ $= -3 + 2[6 + 4]$ $= -3 + 2[10]$ $= -3 + 20$ $= 17$
$(2a)^2$ when $a = -1$ $(2a)^2$ $= (2(-1))^2$ $= (-2)^2$ $= 4$	

**If a problem contains several kinds of grouping symbols, perform operations in parentheses (), then brackets [], then braces {}**

Chapter 2: Solving Equations and Inequalities

Solving equations and inequalities is a crucial skill in algebra. In this chapter, we delve into the different methods for finding the solutions to various types of equations and inequalities. We cover techniques such as

substitution, elimination, and factoring, equipping you with the tools to solve complex algebraic problems.

$3x - y = 12$

$x = 5$

$y = 3$

$3(5) - y = 12$

$15 - y = 12$

$12 = 12$

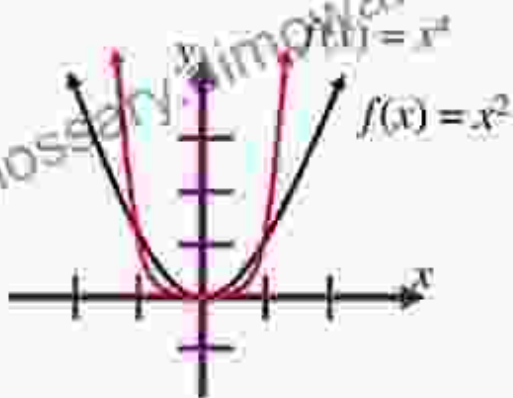
✓

Master the art of solving equations with our step-by-step guide.

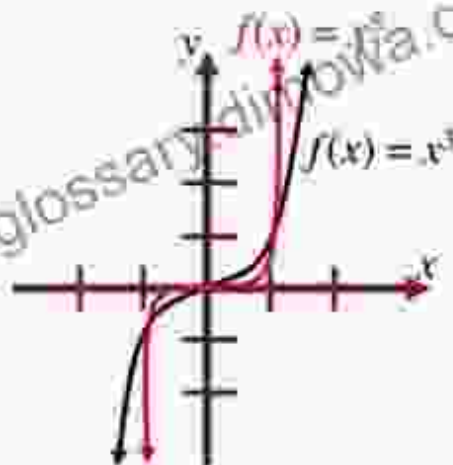
Chapter 3: Polynomials, Functions, and Graphs

Polynomials, functions, and graphs are fundamental concepts in algebra. In this chapter, we explore the properties and operations associated with polynomials, including degree, roots, and factorization. We also introduce the concept of functions and their graphical representations, providing a deeper understanding of algebraic relationships.

Polynomial functions of the form $f(x) = x^n$, $n \geq 1$ are called **power functions**.



If n is *even*, their graphs resemble the graph of $f(x) = x^2$.



If n is *odd*, their graphs resemble the graph of $f(x) = x^3$.

Moreover, the greater the value of n , the flatter the graph near the origin.

Chapter 4: Matrices, Vectors, and Systems of Equations

Matrices and vectors are essential mathematical tools used in various applications. In this chapter, we introduce the concept of matrices, their operations, and their applications in solving systems of equations. We also explore the properties of vectors and their use in representing physical quantities and geometric objects.

Matrix-vector Multiplication

$$\begin{aligned}
 & \begin{bmatrix} 1 & 0 & -2 \\ 0 & 3 & -1 \\ 1 & 2 & 1 \end{bmatrix} \begin{bmatrix} 1 \\ -1 \\ 4 \end{bmatrix} \\
 &= 1 \begin{bmatrix} 1 \\ 0 \\ 1 \end{bmatrix} + (-2) \begin{bmatrix} -1 \\ 3 \\ 2 \end{bmatrix} + 4 \begin{bmatrix} -2 \\ -1 \\ 1 \end{bmatrix} \\
 &= \begin{bmatrix} 1(1) + (-2)(-1) + 4(-2) \\ 0(0) + (-2)(3) + 4(-1) \\ 1(1) + (-2)(2) + 4(1) \end{bmatrix} \\
 &= \begin{bmatrix} -3 \\ -7 \\ 5 \end{bmatrix}
 \end{aligned}$$

$$\begin{aligned}
 & \begin{bmatrix} 1 & 0 & -2 \\ 0 & 3 & -1 \\ 1 & 2 & 1 \end{bmatrix} \begin{bmatrix} 1 \\ -1 \\ 4 \end{bmatrix} \\
 &= \begin{bmatrix} 1(1) + (-2)(-1) + 4(-2) \\ 0(0) + (-2)(3) + 4(-1) \\ 1(1) + (-2)(2) + 4(1) \end{bmatrix} = \begin{bmatrix} -3 \\ -7 \\ 5 \end{bmatrix} \\
 & \text{is called the dot product.} \\
 & \text{if } \vec{v} = \begin{bmatrix} 1 \\ 0 \\ 2 \end{bmatrix} \quad \vec{w} = \begin{bmatrix} 1 \\ -1 \\ 4 \end{bmatrix} \\
 & \text{then,} \\
 & \vec{v} \cdot \vec{w} = 1(1) + (-1)(0) + 2(4) = 9
 \end{aligned}$$

1

Discover the power of matrices and vectors in solving complex problems.

Chapter 5: Applications of Algebra

Algebra has a wide range of applications in science, engineering, and everyday life. In this chapter, we explore some practical applications of algebra, including its use in cryptography, computer science, and financial modeling. We demonstrate how algebraic principles are applied in real-world scenarios, highlighting the importance and versatility of this mathematical discipline.



ALGEBRA REAL LIFE USES

13 common examples

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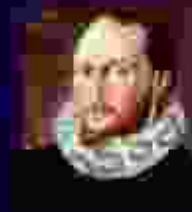
Chapter 6: History of Algebra

The history of algebra is a fascinating journey that spans several centuries. In this final chapter, we trace the evolution of algebra from its ancient origins in Babylonia and Egypt to its modern-day applications. We explore the contributions of key mathematicians throughout history and highlight the impact of algebra on the development of mathematics and science.

- Now mathematicians were able to write equations with more than one unknown

- Thomas Harriot (1620's)

$$\approx 5aaa + 7bb$$



- Pierre Herigone (1634)

$$\approx 5a^3 + 7b^2$$



- James Hume (1636)

$$\approx 5a^{III} + 7b^{II}$$



- Rene Descartes (1637)

$$\approx 5a^3 + 7b^2$$

Embark on a historical exploration of algebra and its impact on civilization.

Our Very Short to Algebra provides a comprehensive overview of this essential mathematical discipline, making it accessible to anyone interested in gaining a deeper understanding of its concepts and applications.

Whether you are a student, a professional, or simply curious about the world of mathematics, this book is an invaluable resource that will unlock the secrets of algebra and empower you to solve problems, make informed decisions, and appreciate the beauty and elegance of this fascinating subject.

Free Download your copy today and embark on a journey of algebraic discovery!



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Younger Ten: Writing the Ten-Minute Play

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Price Forecasting Models For Asta Funding Inc Asfi Stock Nasdaq Composite

In the ever-evolving landscape of the stock market, the ability to forecast stock prices accurately can provide investors with a significant...