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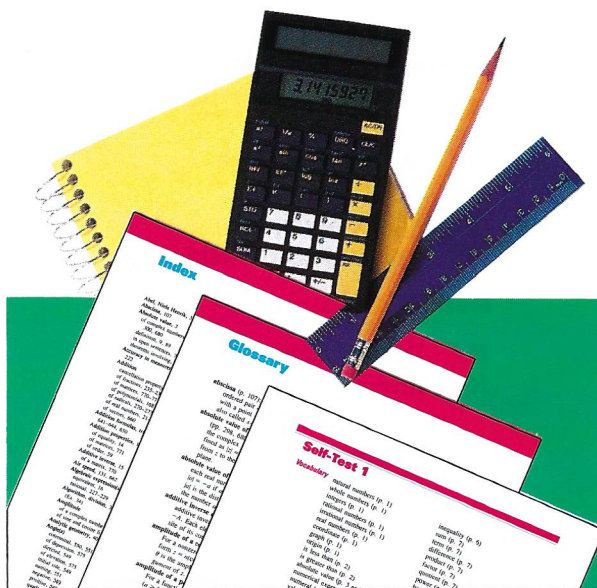
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Answers to Selected Exercises		

Reading Your Algebra Book

An algebra book requires a different type of reading than a novel or a short story. Every sentence in a math book is full of information and logically linked to the surrounding sentences. You should read the sentences carefully and think about their meaning. As you read, remember that algebra builds upon itself; for example, the method of factoring that you'll study on page 188 will be useful to you on page 697. Be sure to read with a pencil in your hand: Do calculations, draw sketches, and take notes.

Vocabulary

You'll learn many new words in algebra. Some, such as *polynomial* and *parabola*, are mathematical in nature. Others, such as *power* and *proof*, are used in everyday speech but have different meanings when used in algebra. Important words whose meanings you'll learn are printed in **heavy type**. Also, they are listed at the beginning of each Self-Test. If you don't recall the meaning of a word, you can look it up in the Glossary or the Index at the back of the book. The Glossary will give you a definition, and the Index will give you page references for more information.

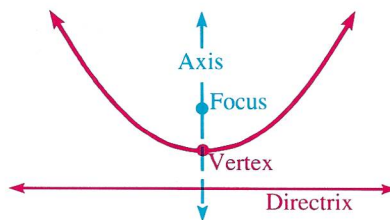


Symbols

Algebra, and mathematics in general, has its own symbolic language. You must be able to read these symbols in order to understand algebra. For example, $|x| > 2$ means “the absolute value of x is greater than 2.” If you aren't sure what a symbol means, check the list of symbols on page xvi.

Diagrams

Throughout this book you'll find many diagrams. They contain information that will help you understand the concepts under discussion. Study the diagrams carefully as you read the text that accompanies them.



Displayed Material

Throughout this book important information is displayed in gray boxes. This information includes properties, definitions, methods, and summaries. Be sure to read and understand the material in these boxes. You should find these boxes useful when reviewing for tests and exams.

If a is a real number and m and n are positive integers, then $a^m \cdot a^n = a^{m+n}$.

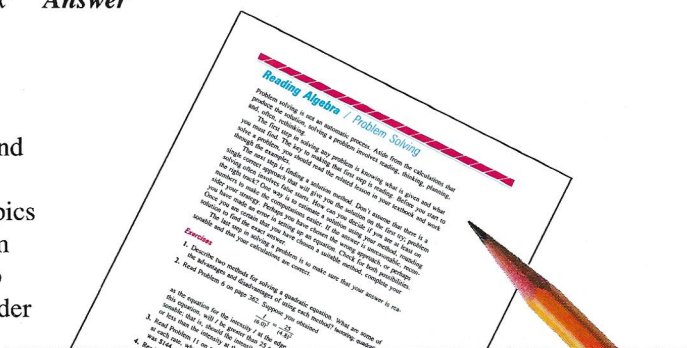
This book also contains worked-out examples. They will help you in doing many of the exercises and problems.

Example Simplify $x^3 \cdot x^5$.

Solution $x^3 \cdot x^5 = x^{3+5} = x^8$ *Answer*

Reading Aids

Throughout this book you will find sections called Reading Algebra. These sections deal with such topics as independent study and problem solving strategies. They will help you become a more effective reader and problem solver.

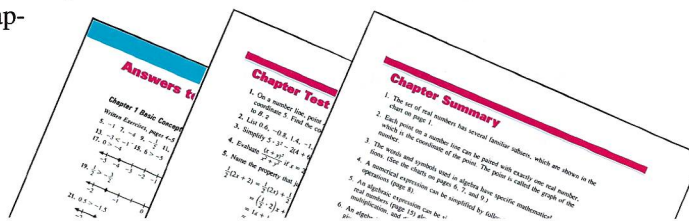


Exercises, Tests, and Reviews

Each lesson in this book is followed by Oral and Written Exercises. Lessons may also include Problems, Mixed Review Exercises, and optional Computer Exercises. Answers for all Mixed Review Exercises and for selected Written Exercises, Problems, and Computer Exercises are given at the back of this book.

Within each chapter you will find Self-Tests that you can use to check your progress. Answers for all Self-Tests are also given at the back of this book.

Each chapter concludes with a Chapter Summary that lists important ideas from the chapter, a Chapter Review in multiple-choice format, and a Chapter Test. Lesson numbers in the margins of the Review and Test indicate which lesson a group of questions covers.



Reading Algebra/Symbols

		Page			Page
{ }	set	1	$\log_b N$	logarithm of N to the base b	469
$ a $	absolute value of a	3	Σ	summation sign	518
=	equals <i>or</i> is equal to	6	!	factorial	540
\neq	does not equal	6	$^\circ$	degree	549
>	is greater than	6	'	minute	550
<	is less than	6	"	second	550
\leq	is less than or equal to	6	\overrightarrow{AB}	vector AB	659
\geq	is greater than or equal to	6	$\ \mathbf{u}\ $	norm of the vector \mathbf{u}	661
\therefore	therefore	6	Cos^{-1}	inverse cosine <i>or</i> arc cosine	689
a^n	the n th power of a	7	σ	standard deviation	715
\in	is an element of	9	r	correlation coefficient	725
$-a$	additive inverse of a <i>or</i> the opposite of a	15	${}_n P_r$	number of permutations of n elements taken r at a time	735
\emptyset	empty set or null set	38	${}_n C_r$	number of combinations of n elements taken r at a time	738
$f(x)$	f of x <i>or</i> the value of f at x	142	$P(E)$	probability of event E	745
\approx	is approximately equal to	222	\cap	intersection	754
\pm	plus-or-minus sign	259	\cup	union	754
$\sqrt[n]{b}$	n th root of b	260	\bar{E}	complement of event E	757
i	imaginary unit ($i^2 = -1$)	288	det	determinant	787
\bar{z}	conjugate of the complex number z	298	A^{-1}	inverse of matrix A	790
$a^{p/q}$	q th root of p th power of a	455			
f^{-1}	inverse function of f	464			

Greek letters: α , β , γ , θ , π , σ , ϕ , ω *alpha, beta, gamma, theta, pi, sigma, phi, omega*

Reading Algebra/Table of Measures

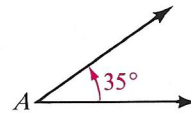
<i>Metric Units</i>		
Length	10 millimeters (mm)	= 1 centimeter (cm)
	100 centimeters } 1000 millimeters }	= 1 meter (m)
	1000 meters	= 1 kilometer (km)
Area	100 square millimeters (mm ²)	= 1 square centimeter (cm ²)
	10,000 square centimeters	= 1 square meter (m ²)
Volume	1000 cubic millimeters (mm ³)	= 1 cubic centimeter (cm ³)
	1,000,000 cubic centimeters	= 1 cubic meter (m ³)
Liquid Capacity	1000 milliliters (mL)	= 1 liter (L)
	1000 cubic centimeters	= 1 liter
Mass	1000 milligrams (mg)	= 1 gram (g)
	1000 grams	= 1 kilogram (kg)
Temperature in degrees Celsius (°C)	0°C	= freezing point of water
	100°C	= boiling point of water

<i>United States Customary Units</i>		
Length	12 inches (in.)	= 1 foot (ft)
	36 inches } 3 feet }	= 1 yard (yd)
	5280 feet } 1760 yards }	= 1 mile (mi)
Area	144 square inches (in. ²)	= 1 square foot (ft ²)
	9 square feet	= 1 square yard (yd ²)
Volume	1728 cubic inches (in. ³)	= 1 cubic foot (ft ³)
	27 cubic feet	= 1 cubic yard (yd ³)
Liquid Capacity	16 fluid ounces (fl oz)	= 1 pint (pt)
	2 pints	= 1 quart (qt)
	4 quarts	= 1 gallon (gal)
Weight	16 ounces (oz)	= 1 pound (lb)
Temperature in degrees Fahrenheit (°F)	32°F	= freezing point of water
	212°F	= boiling point of water

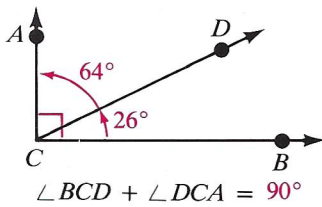
<i>Time</i>		
	60 seconds (s)	= 1 minute (min)
	60 minutes	= 1 hour (h)

Facts and Formulas from Geometry

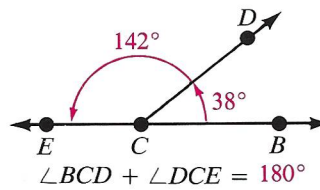
Angle: A figure formed by two rays that have the same end-point. To indicate that the measure of $\angle A$ is 35° , we write $\angle A = 35^\circ$.



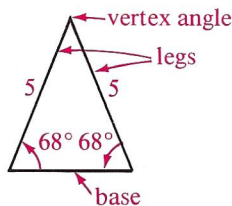
Complementary angles: two angles whose measures have the sum 90° .



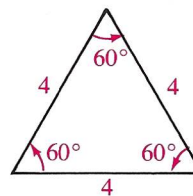
Supplementary angles: two angles whose measures have the sum 180° .



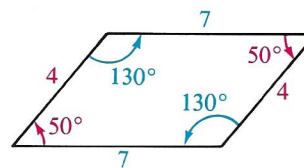
Isosceles triangle: a triangle having at least two equal sides and two equal angles. The two sides are called *legs* and the included angle is called the *vertex angle*.



Equilateral triangle: a triangle having three equal sides. Each angle measures 60° , so the triangle is also called *equiangular*.



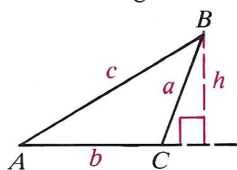
Parallelogram: a quadrilateral (a four-sided polygon) whose opposite sides are equal and parallel. The opposite angles are also equal.



The sum of the measures of the angles of a polygon with n sides is $180(n - 2)^\circ$. For example, the sum of the measures of the angles of a triangle is 180° and the sum of the measures of the angles of a quadrilateral is 360° .

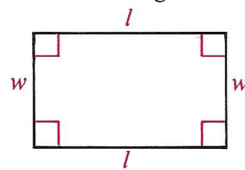
Let: A = area, P = perimeter, C = circumference, S = lateral surface area, T = total surface area, V = volume, $\pi \approx 3.1416$

Triangle



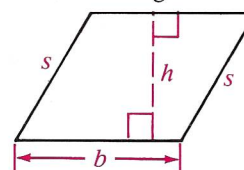
$$P = a + b + c; A = \frac{1}{2}bh$$

Rectangle



$$P = 2l + 2w; A = lw$$

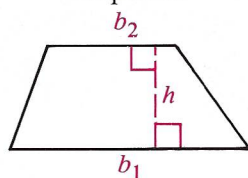
Parallelogram



$$P = 2b + 2s; A = bh$$

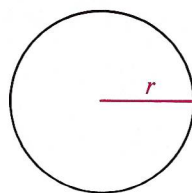
Facts and Formulas from Geometry

Trapezoid



$$A = \frac{1}{2}h(b_1 + b_2)$$

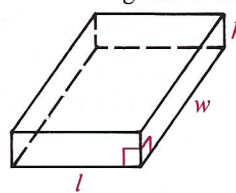
Circle



$$C = 2\pi r$$

$$A = \pi r^2$$

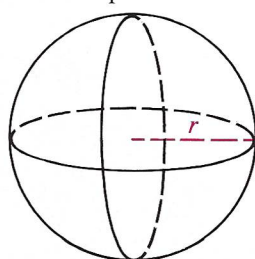
Rectangular Box



$$V = lwh$$

$$T = 2lw + 2lh + 2wh$$

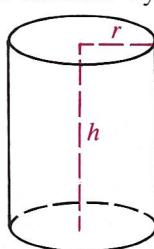
Sphere



$$V = \frac{4}{3}\pi r^3$$

$$T = 4\pi r^2$$

Right Circular Cylinder

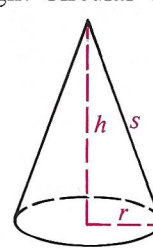


$$V = \pi r^2 h$$

$$S = 2\pi r h$$

$$T = 2\pi r h + 2\pi r^2$$

Right Circular Cone



$$V = \frac{1}{3}\pi r^2 h$$

$$S = \pi r s$$

$$T = \pi r s + \pi r^2$$

Using Technology with This Course

There are three types of optional computer material in this text: Computer Key-In features, Computer Exercises, and suggestions for using computer graphing techniques to explore concepts and confirm results.

The Computer Key-In features can be used by students without previous programming experience. These features teach some programming in BASIC and usually include a program that students can run to explore an algebra topic covered in the chapter.

The optional Computer Exercises are designed for students who have some familiarity with programming in BASIC. Students are usually asked to write one or more programs related to the lesson just presented.

The suggestions for applying computer graphing techniques are appropriate for use with a graphing calculator or graphing software such as *Algebra Plotter Plus*.

Calculator Key-In features and certain exercise sets also suggest appropriate use of scientific calculators with this course.