Algebra II Workbook

A Comprehensive Review and Step-by-Step Guide for Mastering Essential Math Skills

Reza Nazari & Ava Ross

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By

Reza Nazari

& Ava Ross

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Reza Nazari & Ava Ross

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Description

Algebra 2 Workbook provides students with the confidence and math skills they need to succeed in any math course they choose and prepare them for future study of Pre–Calculus and Calculus, providing a solid foundation of Math topics with abundant exercises for each topic. It is designed to address the needs of math students who must have a working knowledge of algebra.

This comprehensive workbook with over 2,500 sample questions is all you need to fully prepare for your algebra 2 course. It will help you learn everything you need to ace the algebra 2 exam.

Inside the pages of this comprehensive workbook, students can learn algebra operations in a structured manner with a complete study program to help them understand essential math skills. It also has many exciting features, including:

- Dynamic design and easy–to–follow activities
- A fun, interactive and concrete learning process
- Targeted, skill–building practices
- Fun exercises that build confidence
- Math topics are grouped by category, so you can focus on the topics you struggle on
- All solutions for the exercises are included, so you will always find the answers

Algebra 2 Workbook is an incredibly useful tool for those who want to review all topics being taught in algebra 2 courses. It efficiently and effectively reinforces learning outcomes through engaging questions and repeated practice, helping you to quickly master Math skills.



About the Author

Reza Nazari is the author of more than 100 Math learning books including:

– Math and Critical Thinking Challenges: For the Middle and High School Student

– GED Math in 30 Days

– ASVAB Math Workbook 2018 - 2019

– Effortless Math Education Workbooks

– and many more Mathematics books …

Reza is also an experienced Math instructor and a test–prep expert who has been tutoring students since 2008. Reza is the founder of Effortless Math Education, a tutoring company that has helped many students raise their standardized test scores—and attend the colleges of their dreams. Reza provides an individualized custom learning plan and the personalized attention that makes a difference in how students view math.

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Chapter 1: Fundamentals and Building Blocks

Topics that you'll learn in this chapter:

- ✓ The Order of Operation
- ✓ Scientific Notation
- ✓ Exponents Operations
- ✓ Evaluating Expressions
- ✓ Simplifying Algebraic Expressions

The Order of Operation

Helpful Hints

- Use "order of operations" rule when there are more than one math operation.
- PEMDAS (parentheses / exponents / multiply / divide / add / subtract)

Example:

$(12 + 4) \div (-4) = -4$

Evaluate each expression.

1) $(2 \times 2) + 5$

2) $24 - (3 \times 3)$

3) $(6 \times 4) + 8$

4) $25 - (4 \times 2)$

5) $(6 \times 5) + 3$

6) $64 - (2 \times 4)$

7) $25 + (1 \times 8)$

8) $(6 \times 7) + 7$

9) $48 \div (4 + 4)$

10) $(7 + 11) \div (-2)$

11) $9 + (2 \times 5) + 10$

12) $(5 + 8) \times \frac{3}{5} + 2$

13) $2 \times 7 - (\frac{10}{9-4})$

14) $(12 + 2 - 5) \times 7 - 1$

15) $(\frac{7}{5-1}) \times (2 + 6) \times 2$

16) $20 \div (4 - (10 - 8))$

17) $\frac{50}{4\,(5-4)-3}$

18) $2 + (8 \times 2)$

Scientific Notation

Helpful Hints

– It is used to write very big or very small numbers in decimal form.

– In scientific notation all numbers are written in the form of:

$$m \times 10^n$$

Decimal notation	Scientific notation
5	5×10^0
–25,000	-2.5×10^4
0.5	5×10^{-1}
2,122.456	$2{,}122456 \times 10^3$

Write each number in scientific notation.

1) 91×10^3
2) 60
3) 2000000
4) 0.0000006
5) 354000
6) 0.000325
7) 2.5
8) 0.00023
9) 56000000
10) 2000000
11) 78000000
12) 0.0000022
13) 0.00012
14) 0.004
15) 78
16) 1600
17) 1450
18) 130000
19) 60
20) 0.113
21) 0.02

Exponents Operations

Helpful Hints

Exponents rules

$x^a \cdot x^b = x^{a+b}$ $\quad x^a/x^b = x^{a-b}$

$1/x^b = x^{-b}$ $\quad (x^a)^b = x^{a.b}$

$(xy)^a = x^a \cdot y^a$

-5^{-2} is not the same as $(-5)^{-2}$

$-5^{-2} = -\frac{1}{5^2}$ and $(-5)^{-2} = +\frac{1}{5^2}$

Example:

$(x^2y)^3 = x^6y^3$

Simplify the exponents.

1) $(10^4)^3$

2) $(2a^2b)^4$

3) $4^3 \cdot x^6 \cdot x^8$

4) $(5x^5y^4)(-2y^3)$

5) $(2x^4 \cdot x^3 \cdot 4)^2$

6) $x^2y \cdot 9x^6y^3$

7) $(3p^3)(-2mp^2)$

8) $\frac{a^7}{5a^3}$

9) $(\frac{14b^6}{7b^2})^2$

10) $(\frac{8nm^3}{4n^4m^5})^3$

11) $\frac{x^{18}}{x^8}$

12) $(-2x^2y^6)^5$

13) $(\frac{5x}{3x})^2$

14) $(xy)^2 (x^2y^2)^2$

15) $\frac{6x^8}{4x^6}$

16) $(3y^3 \cdot 2y)^2$

17) $7x \cdot 5x^5$

18) $9 \cdot 9^{-3}$

19) $(3x)^2$

20) $(5x^2)(7x^2)$

Evaluating Expressions

Helpful Hints

To evaluate an algebraic expression, substitute a number for each variable and perform the arithmetic operations.

Example:

$2x + 4y - 3 + 2,$

$x = 5, y = 3$

$2(5) + 4(3) - 3 + 2$

$= 10$

$+ 12 - 3 + 2$

$= 21$

Evaluate each using the values given.

1) $(x^2 - y) \div 4,$

use x = 3, y = 2

2) $(a + b)\ 4 - (3 - 3),$

use a = 2, b = 1

3) $-6x + 8 - 4y - 5,$

use x = 4, y = 2

4) $a^3 - b,$

use a = 2, b = 3

5) $y^3\ (x - (x + 7 - xy) + y),$

use x = 5, y = 3

6) $(n - m)(m + 2),$

use n = 3, m = – 6

7) $y - (y + x),$

use x = 5, z = 8

8) $6\ (2n - 4m),$

use n = 5, m = 3

9) $-14 + 3\ (4w + 4k),$

use k = 4, w = 6

10) $-6 - 5\ (3f + 4k),$

use f = 4, k = 7

Simplifying Algebraic Expressions

Helpful Hints

A variable is a letter that represents unknown numbers. A variable can be used in the same manner as all other numbers:

Addition	2 + a	2 plus a
Subtraction	$y - 3$	y minus 3
Division	$\frac{4}{x}$	4 divided by x
Multiplication	5a	5 times a

Simplify each expression.

1) 3 (4x + 3y) + 5 (y + x)

2) $6a^2 + 5b + 15a^2$

3) 7x + 4 (7x + 5)

4) 3 (2x + y) + 8x + 5y

5) 4 (0.5x + 0.2y) + 0.4x

6) 8x + 10 (3x + 5)

7) 3 (7a + 3b) + 8 (2b + a)

8) – 4 (3x – 9) + 8x

9) 12 – 3 (– 6x + 3)

10) – 5 + 14x – 5x – 2 + 24x

11) $92x^2 + 1 + x - 1 + xy + \frac{2x^3}{2x} + 1$

12) $104b^2 + 35v - 3vz + 2bv + bv + - 90$

13) – 25 + 55x – 78 – x –1 + 1 – 23x + 1