Algebra I 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 I 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 Geometry, Algebra 2, 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 basic Math and algebra.

This comprehensive workbook with over 2,500 sample questions is all you need to fully prepare for your algebra 1 course. It will help you learn everything you need to ace the algebra 1 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 I Workbook is an incredibly useful tool for those who want to review all topics being taught in algebra 1 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: The Basics

Topics that you'll learn in this chapter:

- ✓ Variables and Expressions
- ✓ Order of Operations
- ✓ Properties of Numbers
- ✓ The Distributive Property
- ✓ Equations

Variables and 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

Write a verbal expression for each algebraic expression.

1) a + 2b

2) $5c^2$

3) $x - 14$

4) $\frac{30}{5}$

5) p^2

6) $2x + 6$

7) $x^2 + 9y + 4$

8) $x^3 - 7y + 3$

9) $\frac{2}{3}x + \frac{4}{5}y - 5$

10) $\frac{1}{6}(x + 7) - 9y$

Write an algebraic expression for each verbal expression.

11) 10 less than *h*

12) The product of 5 and *a*

13) The product of 24 and *k*

14) The product of 3 and the second power of x

15) 8 less than h to the fourth power

16) 9 more than twice *d*

17) Three fourths the square of *d*

18) The difference of 12 and 2 times *a* number

19) 56 more than the square of *a* number

20) Three fifths the cube of *a* number

Order of Operations

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) $2 + (8 \times 2)$

Properties of Numbers

Helpful Hints

- PEMDAS (parentheses / exponents / multiply / divide / add / subtract)

Evaluate each expression. Name the property used in each step.

1) $3\ [4 - 2 \times 6] \div 6$

2) $5\ (6 + 8) \times 12$

3) $3 + 6 \times 12$

4) $15 - (6 - 2) \times 10$

5) $6\ [2 - (10 \div 2)]$

6) $4\ (9 \div 3 - 7) \times \frac{1}{2}$

7) $8 + 12\ [5 - 3\ (4 + 6)]$

8) $6 + 2\ (18 - 3^2) - 4$

9) $4\ (12 - 42 \div 3) + 3 \times \frac{4}{3}$

10) $5\ (27 \div 3^2)$

Find the value of x.

11) $5\ (2 \times 6) = 2\ (x \times 5)$

12) $(1 \times 5)\ 7 = (7 \times 1)\ x$

13) $(9 \times 1)\ 6 = x\ (9 \times 6)$

14) $(x \times 0)\ 10 = (4 \times 10)\ 0$

15) $(3 \times 1)\ 5 = (x \times 3)$

16) $(9 \times 3)\ 10 = x\ (10 \times 9)$

The Distributive Property

Helpful Hints

Distributive Property:

$$a\,(b\,+\,c)\,=\,ab\,+\,ac$$

Example:

$$3\,(4\,+\,3x)$$

$$=\,12\,+\,9x$$

Simplify each expression.

1) $-2-x^2-6x^2$

2) $3+10x^2+2$

3) $8x^2+6x+7x^2$

4) $5x^2-12x^2+8x$

5) $2x^2-2x-x$

6) $(-6)(8x-4)$

7) $4x+6(2-5x)$

8) $10x+8(10x-6)$

9) $9(-2x-6)-5$

10) $3(x+9)$

11) $7x+3-3x$

12) $2.5x^2\times(-8x)$

Simplify.

13) $-2(4-6x)-3x,\ x=1$

14) $2x+8x,\ x=2$

15) $9-2x+5x+2,\ x=5$

16) $5(3x+7),\ x=3$

17) $2(3-2x)-4,\ x=6$

18) $5x+3x-8,\ x=3$

19) $x-7x,\ x=8$

20) $5(-2-9x),\ x=4$

Equations

Helpful Hints

- The values of two expressions on both sides of an equation are equal.

$$ax + b = c$$

- You only need to perform one Math operation in order to solve the equation.

Example:

$-8x = 16$

$x = -2$

Solve each equation.

1) $x - 7 = 13$

2) $m + 4 = -12$

3) $p - 6 = -5$

4) $m - 9 = -13$

5) $14b = -56$

6) $10n = 40$

7) $-17x = -204$

8) $-126 = 14k$

9) $-16 + x = -15$

10) $-15x = 0$

11) $1.5 + 5.5 = x$

12) $12 - 6 \times 3 = x$

13) $\frac{3^2(6+4)}{(7-4)} = y$

14) $\frac{(3-5+8)}{4^2(2+5)} = x$

15) $3 + 5 \times \frac{6}{15} = y$

16) $2 \times \frac{(5+7)}{(2+4)} = 2^3x$

17) $12 - 6 + 3 \times 14 \div 2 = y$

18) $3^2 \div 6 + \frac{3}{2} = y$

19) $2.5x + 6 = 0.5x$

20) $12\,(4^2 - 6) = 2x - 10$

Answers of Worksheets – Chapter 1

Variables and Expressions

1) a plus 2 times b

2) 5 times c squared

3) a number minus 14

4) the quotient of 30 and 5

5) p squared

6) six more than twice a number

7) x squared plus the product of 9 and y plus 4

8) x cubed minus the product of 7 and y plus 3

9) the sum of two–thirds of x and four–fifths of y, minus 5

10) one–sixth of the sum of x and 7 minus the product of 9 and y

11) $10 < h$

12) $5a$

13) $24k$

14) $3x^2$

15) $8 < h^4$

16) $2b + 9$

17) $\frac{3}{4}d^2$

18) $12 - 2a$

19) $56 + a^2$

20) $\frac{3}{5}x^3$

Order of Operations

1) 9
2) 15
3) 32
4) 17
5) 33
6) 56
7) 33
8) 49
9) 6
10) – 9
11) 29
12) 9.8
13) 12
14) 62
15) 28
16) 10
17) 50
18) 18

Properties of Numbers

1) – 4
2) 840
3) 75
4) 25
5) – 18
6) –8
7) – 292
8) 20
9) – 4
10) 15
11) 6
12) 5
13) 1
14) 0
15) 5
16) 3

The Distributive Property

1) 5x + 2
2) 6x – 2
3) –5x + 10
4) 3x – 7
5) 16x + 64
6) 4x + 24
7) – 24x + 32
8) 42x – 21
9) – 24x – 12
10) – 18x + 72
11) $-38x^2 - 14x$
12) – 27x + 15
13) – 5x – 10
14) – 6x + 14
15) – 16x + 13
16) – 6x – 14

Equations

1) {20}
2) {–16}
3) {1}
4) {–4}
5) {–4}
6) {4}
7) {12}
8) {–9}
9) {1}
10) {0}
11) $7 = x$
12) $-4 = x$
13) $30 = y$
14) $\frac{5}{56} = x$
15) $5 = y$
16) $\frac{1}{2} = x$
17) $27 = y$
18) $3 = y$
19) $x = -3$
20) $x = 55$