Algebra I

Workbook

Comprehensive Activities for Mastering Essential Math Skills

- Dynamic design and easy-to-follow activities
- A fun, interactive and concrete learning process
- Targeted, skill-building practices
- Fun exercises that build confidence
- All solutions for the exercises are included, so you will always find the answers

Reza Nazari & Ava Ross

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Comprehensive Activities for Mastering Essential Math Skills

By

Reza Nazari

& Ava Ross

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All inquiries should be addressed to:

info@effortlessMath.com

www.EffortlessMath.com

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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.

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
- 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 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.

You can contact Reza via email at:
reza@EffortlessMath.com

Find Reza's professional profile at:
goo.gl/zoC9rJ

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Chapter 1: The Basics

1–1 Variables and Expressions

1–2 Order of Operations

1–3 Properties of Numbers

1–4 The Distributive Property

1–5 Equations

1–6 Relations

1–7 Functions

1–8 Logical Reasoning and Counterexamples

1–1 Variables and Expressions

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

1–2 Order of Operations

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) $2 + (8 \times 2)$

1–3 Properties of Numbers

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

1–4 The Distributive Property

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

1–5 Equations

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

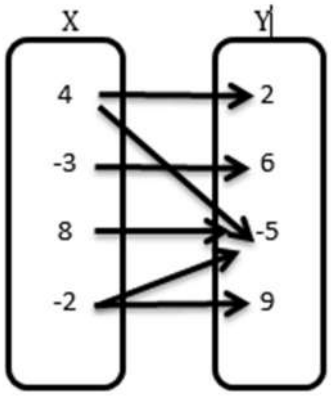
19) $2.5x + 6 = 0.5x$

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

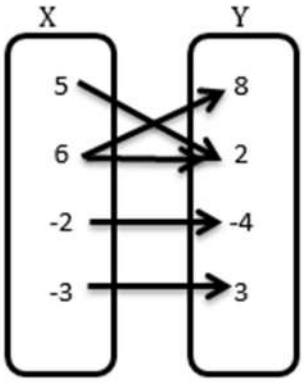
1–6 Relations

Express the relation shown in each table, mapping, or graph as a set of ordered pairs.

1)



2)



3)

X	Y
4	5
–1	3
6	–2
–8	7

4)

X	Y
2	–5
5	9
–6	3
3	–7

Determine if the following relations are functions. Then state the domain.

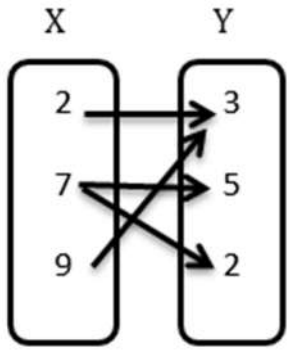
5) {(1, –2), (–2, 0), (–1, 2), (1, 3)}

6) {(1, 1), (2, 2), (3, 5), (4, 10), (5, 15)}

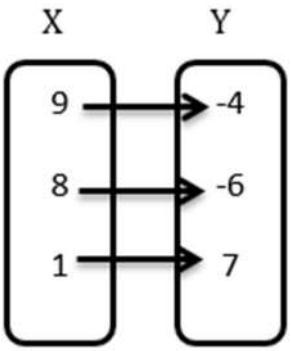
1–7 Functions

Determine whether each relation is a function. Explain.

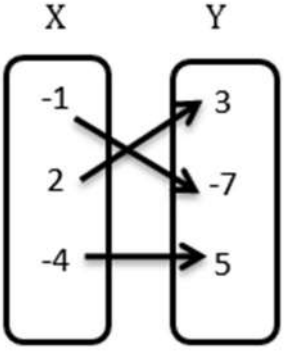
1)



2)



3)



4)

X	Y
5	−4
3	6
2	9
−7	1

5)

X	Y
6	3
−8	−2
6	3
−4	4

6)

X	Y
9	−6
7	−4
2	3
2	7

7) {(2, 3), (4, 1), (6, 4), (5, 7)}

8) {(6, 2), (4, 7), (5, 9) ,(6, 3)}

9) {(5, 4), (7, 9), (4, 3), (5, 4)}

10) {(4, 6), (5, 8), (6,1), (7, 2)}

11) $x = 15$

12) $y = x^2$

13) $y = 5x - 2$

14) $y = 6$