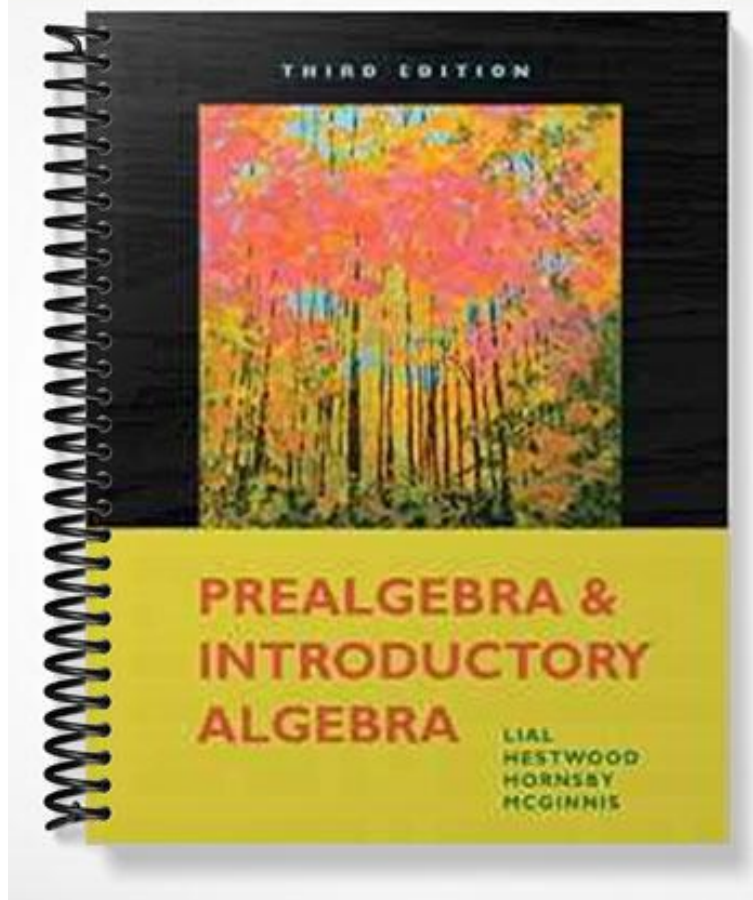


SOLUTIONS MANUAL



Chapter 1 INTRODUCTION TO ALGEBRA: INTEGERS

1.1 Place Value

Key Terms

1. digits
2. whole numbers
3. place value system

Objective 1

1. 2
3. 3, 4
5. 0, 6

Objective 2

7. tens
9. hundred-millions
11. ten-millions
13. ones
15. hundred-billions, millions, ten-thousands, hundreds

Objective 3

17. fifty-nine billion, five hundred four million, eight hundred six thousand, eight hundred seventy-three
19. four hundred sixty-four billion, one hundred ten million, fifty-four thousand
21. seventy-six million, one thousand, one hundred eleven
23. five trillion, five hundred nine billion, two million, seventeen thousand, eight hundred
25. 41,002
27. 70,000,012,008
29. 987, 000,330

1.2 Introduction to Signed Numbers

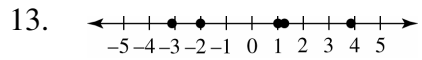
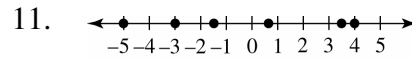
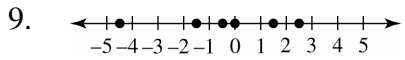
Key Terms

1. absolute value 2. number line 3. integers

Objective 1

1. -14 3. $+830$ 5. -120
7. $-1,200,000$

Objective 2



Objective 3

15. $<$ 17. $>$ 19. $<$
21. $<$

Objective 4

23. 95 25. 11 27. 474
29. 878

1.3 Adding Integers**Key Terms**

1. commutative property of addition
2. addends
3. associative property of addition
4. sum
5. addition property of 0

Objective 1

1. 6
3. -8
5. 0
7. -28
9. -9
11. -12
13. 37
15. -38
17. 58°F
19. 18 points

Objective 2

21. $-2 + -9; -11$
23. $-4 + 7; 3$
25. $(-8 + 8) + -15 = -15$
27. $-2 + (4 + 6) = 8$
29. $(-11 + 11) + 2 = 2$

1.4 Subtracting Integers

Key Terms

1. opposite 2. additive inverse

Objective 1

1. -8 ; $-8+8=0$ 3. -4 ; $4+^{-}4=0$ 5. 1 ; $^{-}1+1=0$

Objective 2

7. $^{-}19$ 9. 9 11. 11
13. $^{-}25$ 15. $^{-}19$ 17. $^{-}13$
19. 17

Objective 3

21. 0 23. $^{-}22$ 25. $^{-}16$
27. $^{-}3$ 29. 44

1.5 Problem Solving: Rounding and Estimating

Key Terms

1. front end rounding 2. rounding 3. estimate

Objective 1

1. 3 3. 4

Objective 2

5. $\bar{2}90$ 7. 810,000 9. 7,000,000
11. $\bar{7}0,000$

Objective 3

13. 100 15. $\bar{2}0$ 17. $\bar{9}0; \bar{8}8$
19. 9400; 9366 21. $\bar{9}000; \bar{8}488$ 23. $\bar{9}000; \bar{9}022$
25. $\bar{3}000; \bar{3}196$ 27. $\bar{8}0 \text{ m}; \bar{9}1 \text{ m}$ 29. $30^\circ; 35^\circ$

1.6 Multiplying Integers

Key Terms

1. commutative property of multiplication
2. factors
3. associative property of multiplication
4. multiplication property of 0
5. product
6. distributive property
7. multiplication property of 1

Objective 1

1. $-3 \cdot 6; (-3)(6)$
3. $-7 \cdot -8; (-7)(-8)$

Objective 2

5. -35
7. -28
9. 40
11. 160
13. -30
15. 28
17. 6
19. -1
21. 3

Objective 3

23. $4 \cdot -22 = -88$
25. $-5(6) + -5(-1) = -25$

Objective 4

27. 16,000 feet; 14,760 feet
29. \$1600; \$1265

1.7 Dividing Integers

Key Terms

1. factors 2. quotient 3. product

Objective 1

1. 7 3. -7 5. -8

Objective 2

7. 1. Any nonzero number divided by itself is 1.
9. Undefined. Division by 0 is undefined.

Objective 3

11. 2 13. -21 15. 6

Objective 4

17. 70 m; 69 m 19. 40 lb; 45 lb
21. 2500 cycles per sec; 2340 cycles per sec
23. 173 bags
25. 30 pounds

Objective 5

27. $1690 \div 20 = 84 \text{ R}10$. 84 cases can be filled. The remainder of 10 means that 10 bottles (half a case) are left over.
29. $200 \cdot 129 = 25,800$ bytes, and $25,800 \div 1400 = 18 \text{ R}600$. This means that 19 diskettes are needed, of which 18 will be full and the last will hold the remaining 600 bytes.

1.8 Exponents and Order of Operations

Key Terms

1. order of operations
2. exponent

Objective 1

1. 8^4 ; eight to the fourth power
3. 6^5 ; six to the fifth power
5. 7^7 ; seven to the seventh power

Objective 2

7. $^{-1}$
9. $^{-1024}$
11. 64
13. $^{-288}$

Objective 3

15. 24
17. $^{-2}$
19. 0
21. 84
23. $^{-8}$

Objective 4

25. $^{-21}$
27. 16
29. $^{-\frac{1}{8}}$

Chapter 2 UNDERSTANDING VARIABLES AND SOLVING EQUATIONS

2.1 Introduction to Variables

Key Terms

1. expression
2. variable
3. evaluate the expression
4. constant
5. coefficient

Objective 1

1. x : variable
3. -2 : coefficient; w : variable
5. 2 : coefficient; q : variable; 2 : constant

Objective 2

- 7.(a) \$120 (b) \$170
- 9.(a) 140 Newtons (b) 920 Newtons
- 11.(a) \$10,040 (b) \$12,620
- 13.(a) \$6000 (b) \$7484
15. 73 17. -88 19. 7
21. -13

Objective 3

23. Multiplication is distributive over addition.
25. Zero added to any number equals that number.

Objective 4

27. $-6z^3$
29. $u^3v^2w^2$

2.2 Simplifying Expressions

Key Terms

1. like terms
2. term
3. simplify an expression
4. variable term

Objective 1

1. like terms: $2x, -3x$; coefficients: $2, -3$
3. like terms: $3, -4$. The like terms are constants.
5. like terms: $-6a^3b, 7ba^3$; coefficients: $-6, 7$
7. $8pu^2$
9. $16g^2y^4$

Objective 2

11. $7dm^3 + 5sv^3$
13. $-6hq^3 - 39n^4 + 2$
15. $8x^2 - x^2y + 6xy + xy^2 - 5y^2 + 4$
17. $36x^6y^6$
19. $14a^3c^2t$

Objective 3

21. $30a - 35$
23. $-5t - 20$
25. $14z - 4$
27. $33x - 10$
29. $-19a + 9$

2.3 Solving Equations Using Addition

Key Terms

- | | | |
|-------------|----------------------------------|-----------------------|
| 1. solution | 2. addition property of equality | |
| 3. equation | 4. solve an equation | 5. check the solution |

Objective 1

- | | | |
|-------|------|---------|
| 1. 12 | 3. 3 | 5. -2 |
|-------|------|---------|

Objective 2

- | | | |
|--------------|----------------|------------------|
| 7. $k = -9$ | 9. $\ell = 80$ | 11. $n = -66$ |
| 13. $y = -1$ | 15. $p = \$78$ | 17. incorrect; 6 |

Objective 3

- | | | |
|--------------|--------------|-----------------------|
| 19. $h = 19$ | 21. $z = 50$ | 23. $u = -21$ |
| 25. $w = 43$ | 27. $v = 2$ | 29. $b = 111$ minutes |

2.4 Solving Equations Using Division

Key Terms

1. division property of equality
2. addition property of equality

Objective 1

- | | | |
|-------------|--------------|---------------------|
| 1. $s = 5$ | 3. $m = -7$ | 5. $\ell = 13$ |
| 7. $h = 28$ | 9. $r = -24$ | 11. $h = 13$ meters |

Objective 2

- | | | |
|--------------|---------------|--------------|
| 13. $g = -3$ | 15. $m = 33$ | 17. $m = -2$ |
| 19. $h = 3$ | 21. $m = -21$ | |

Objective 3

- | | | |
|--------------|--------------|---------------|
| 23. $c = 20$ | 25. $w = 17$ | 27. $p = -16$ |
| 29. $g = -5$ | | |

2.5 Solving Equations with Several Steps

Key Terms

1. addition property of equality
2. distributive property
3. division property of equality

Objective 1

- | | | |
|--------------|--------------|--------------|
| 1. $g = 3$ | 3. $a = -5$ | 5. $z = 9$ |
| 7. $d = -2$ | 9. $g = 3$ | 11. $t = -2$ |
| 13. $q = -3$ | 15. $z = -1$ | |

Objective 3

- | | | |
|-------------|-------------|-------------|
| 17. $k = 2$ | 19. $a = 8$ | 21. $n = 6$ |
| 23. $t = 6$ | 25. $d = 3$ | 27. $x = 5$ |
| 29. $a = 3$ | | |