
Chapter 3 Linear Equations and Inequalities

3.1 Linear Equations

1. $ax + b = 0$
3. solution set
5. Addition Property of Equality
7. equation
9. contradiction
11. $ax + by = c$

Symbolic Solutions

1. -1
3. 10
5. 4
7. 12
9. $\frac{1}{2}$
11. 4
13. 7
15. -1

Numerical and Graphical Solutions

17.

| | | | | | |
|-----------|------|------|------|------|------|
| x | -2 | -1 | 0 | 1 | 2 |
| $-2x - 3$ | 1 | -1 | -3 | -5 | -7 |

1

19.

| | | | | | |
|----------|------|------|------|------|------|
| x | -2 | -1 | 0 | 1 | 2 |
| $8x + 7$ | -9 | -1 | 7 | 15 | 23 |
| $2x - 5$ | -9 | -7 | -5 | -3 | -1 |

-2

21. 2

Identities and Contradictions

23. contradiction
25. identity

Intercepts of a Line

27. (a) x -int: -3
 y -int: 2
(b) $y = \frac{2}{3}x + 2$
29. (a) x -int: 4
 y -int: -3
(b) $y = \frac{3}{4}x - 3$

3.2 Introduction to Problem Solving

Solving a Formula for a Variable

1. (a) $L = \frac{P}{2} - W$ or $L = \frac{P - 2W}{2}$
(b) 19 inches
3. $0^\circ C$
5. $x = -2y$
7. $a = \frac{2A}{h} - b$ or $a = \frac{2A - bh}{h}$
9. $f(x) = x - 18$

Steps for Solving a Problem

11. (a) $x - 5 = 14$
(b) 19
(b) 6

13. (a) $\frac{x-3}{5} = -2$
 (b) -7

15. (a) $x + (x+2) + (x+4) = 96$
 (b) 30, 32, 34

17. width: 32 ft
 length: 52 ft

19. 1 hr at 7.5 mph
 0.7 hr at 8 mph

21. 4 mph

23. $30^\circ, 70^\circ, 80^\circ$

25. 96

Percentages

27. \$2500 at 6%
 \$500 at 7.5%

29. \$1.5 million

3.3 Linear Inequalities

1. $ax + b > 0$

3. $ax + by = c$

5. solution set

7. equivalent

9. $>$

11. $<$

Symbolic Solutions

1. $\{x | x < 5\}$

3. $\{x | x \geq -3\}$

5. $\{x | x < \frac{10}{3}\}$

7. $\{x | x < 9\}$

9. $\{z | z < \frac{14}{3}\}$

11. $\{x | x > -5\}$

Numerical and Graphical Solutions

13. $\{x | x = 2\}$

15. $\{x | x \geq 2\}$

17. $\{x | x \geq 1\}$

19. $\{x | x = -3\}$

21. $\{x | x > -3\}$

23. $\{x | x > 2\}$

25. $\{x | x < 3\}$

27. $\{x | x > 5\}$

An Application

29. S is between 166 and 200.

3.4 Compound Inequalities

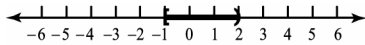
1. compound inequality
3. union; $A \cup B$
5. interval

Basic Concepts

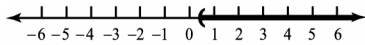
1. no; yes
3. yes; no

Symbolic Solutions and Number Lines

5. $\{x | -1 \leq x < 2\}$



7. $\{x | x > \frac{1}{2}\}$



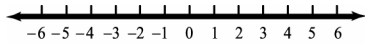
9. $\{x | 1 < x \leq 2\}$

11. $\{m | -5 < m \leq 4\}$

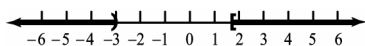
13. from $41^\circ F$ to $77^\circ F$

15. from 1995 to 2000

17. All real numbers



19. $\{x | x < -3 \text{ or } x \geq \frac{5}{3}\}$

**Numerical and Graphical Solutions**

21. $\{x | 0 \leq x \leq 2\}$

Interval Notation

23. $(-3, 4]$

25. $[-5, 0)$

27. $[\frac{8}{3}, \infty)$

29. $(2, \infty)$

3.5 Absolute Value Equations and Inequalities

1. function

3. $|ax + b| = k$

5. $|ax + b| < k$

Absolute Value Equations

1. $-16, 16$

3. No solutions

5. $-4, 4$

7. $1, 11$

9. $-\frac{1}{2}, \frac{3}{2}$

11. $-\frac{5}{2}, \frac{3}{2}$

13. $-1, \frac{1}{2}$

15. $-8, \frac{8}{3}$

Absolute Value Inequalities

17. $[-2, 3]$

19. $-9, 6$

21. $(-\infty, -9] \cup [6, \infty)$

23. $|t - 12.24| \leq 0.02$

25. $(-5, 5)$

27. $[-10, 6]$

29. $(-\infty, -3) \cup (9, \infty)$