

Vocabulary • Algebra

Write the correct word or words from the box on the line next to its definition.

equation	variable	order of operations	simplify
parentheses ()	solution	number expression	

1. marks around an operation that should be done first _____
2. a letter that stands for a number _____
3. to write a shorter or easier form of an expression; or to find its value _____
4. a mathematical sentence stating that two quantities are equal _____
5. the value of a variable that makes an equation true _____
6. the specific order in which to do the four basic operations when more than one operation is in an equation _____
7. a number or numbers together with operation symbols _____

Use the following equation to answer each question below.

$$3x + (9 - 4) = 11$$

$$x = 2$$

8. What was the variable that was used in the equation above?
9. What was the solution to the equation above?

Review • Order of Operations

Lesson 18.3

Simplify.

$64 - 7 \times 6$

Do all the multiplication and division first from left to right. Then, do all addition and subtraction from left to right.

$64 - 42$

22

The value of $64 - 7 \times 6$ is 22.

Simplify each expression. Remember to multiply or divide first.

1. $10 + 6 \div 3 =$

2. $4 \times 7 + 3 =$

3. $5 + 6 \times 9 =$

4. $29 + 4 \times 3 =$

5. $13 - 15 \div 5 =$

6. $24 - 7 \times 3 =$

7. $11 + 3 \times 6 =$

8. $4 \times 9 - 15 =$

9. $56 \div 7 + 3 =$

10. $72 - 10 + 5 =$

11. $45 \div 9 \times 4 =$

12. $26 - 12 \div 3 =$

13. $13 + 75 - 16 =$

14. $8 \times 11 - 6 \times 6 =$

15. $3 \times 12 + 2 \times 5 =$

Review • Solving Equations with Addition and Subtraction

Lesson 18.4

To solve equations with addition or subtraction, **undo** each operation.

Solve each equation.

$$x + 15 = 33$$
$$x + 15 - 15 = 33 - 15$$

Undo the addition
or subtraction.

$$x - 7 = 24$$
$$x - 7 + 7 = 24 + 7$$

$$x + 0 = 18$$
$$x = 18$$

Simplify each side.

$$x + 0 = 31$$
$$x = 31$$

$$18 + 15 \stackrel{?}{=} 33$$
$$33 = 33 \checkmark$$

Check the solution.

$$31 - 7 \stackrel{?}{=} 24$$
$$24 = 24 \checkmark$$

Solve each equation. Check your work.

1. $x + 5 = 12$

2. $y - 9 = 15$

3. $11 = 5 + n$

4. $29 + y = 32$

5. $k - 24 = 38$

6. $4 + x = 40$

7. $y - 55 = 39$

8. $16 + x = 22$

9. $v - 8 = 28$

10. $72 = r - 18$

11. $m + 34 = 81$

12. $k - 7 = 12$

13. $m + 6 = 20$

14. $w - 33 = 45$

15. $15 = c - 6$

16. $14 = r + 3$

17. $76 = y - 30$

18. $63 = w + 44$

Review • Solving Equations with Multiplication and Division

Lesson 18.5

To solve equations with multiplication or division, **undo** each operation.

Solve each equation.

$$4x = 16$$

$$\frac{4x}{4} = \frac{16}{4}$$

$$x = 4$$

$$4(4) ? 16$$

$$16 = 16 \checkmark$$

Undo the multiplication
or division.

Simplify each side.

Check the solution.

$$\frac{y}{3} = 7$$

$$\frac{y}{3} \times 3 = 7 \times 3$$

$$y = 21$$

$$\frac{21}{3} ? 7$$

$$7 = 7 \checkmark$$

Solve each equation. Check your work.

1. $5x = 30$

2. $\frac{y}{9} = 3$

3. $60 = 12x$

4. $2a = 32$

5. $\frac{k}{4} = 13$

6. $4x = 404$

7. $\frac{y}{5} = 3$

8. $16v = 48$

9. $8r = 72$

10. $633 = \frac{r}{3}$

11. $\frac{x}{6} = 21$

12. $\frac{c}{7} = 201$

13. $18 = 9y$

14. $\frac{x}{6} = 14$

15. $7y = 84$

16. $20 = \frac{m}{5}$

17. $98 = 7y$

18. $100 = \frac{x}{2}$

Review • Solving Equations with More Than One Operation

Lesson 18.7

To solve equations with more than one operation, undo the addition or the subtraction first, and then undo the multiplication or the division.

Solve each equation for a .

$$4a - 8 = 20$$

$$4a - 8 + 8 = 20 + 8$$

$$4a = 28$$

$$\frac{4a}{4} = \frac{28}{4}$$

$$a = 7$$

$$4(7) - 8 ? 20$$

$$28 - 8 ? 20$$

$$20 = 20 \checkmark$$

First, undo the addition
or subtraction.

Then undo the
multiplication or division.

Check the solution.

$$\frac{a}{5} + 3 = 8$$

$$\frac{a}{5} + 3 - 3 = 8 - 3$$

$$\frac{a}{5} = 5$$

$$5 \times \frac{a}{5} = 5 \times 5$$

$$a = 25$$

$$\frac{25}{5} + 3 ? 8$$

$$5 + 3 ? 8$$

$$8 = 8 \checkmark$$

Solve each equation. First, undo the addition or subtraction.
Then undo the multiplication.

1. $5x + 2 = 27$

2. $3y - 9 = 6$

3. $9x - 13 = 41$

4. $4m - 7 = 33$

5. $7k + 5 = 54$

6. $5y + 6 = 21$

7. $7 = 2m + 3$

8. $5 = 3x - 4$

Solve each equation. First, undo the addition or subtraction.
Then undo the division.

9. $\frac{x}{5} - 4 = 3$

10. $\frac{m}{6} + 7 = 19$

11. $\frac{y}{8} + 4 = 6$

12. $\frac{k}{5} + 23 = 27$

13. $\frac{y}{7} + 10 = 11$

14. $\frac{w}{5} + 7 = 10$

15. $3 = \frac{v}{2} + 1$

16. $1 = \frac{r}{3} - 15$

Practice • Problem Solving: Using a One-Step Equation

Lesson 18.6

READ the problem. Make a PLAN. DO the plan to solve the problem. Remember to use $d = r \times t$.

1. Miranda drove 5 hours at an average speed of 52 mph. How far did she travel?
2. A plane flew 1,236 miles in 4 hours. What was the plane's average speed (rate) in miles per hour?
3. Stephen drove 432 miles at 48 mph. How long did the trip take?
4. Maria pedaled her bike 24 miles in 3 hours. What was her average speed (rate) in miles per hour?
5. Pasqual flew 1,035 miles in 3 hours. What was his plane's average speed (rate) in miles per hour?
6. Lizzy rode for 7 hours at an average speed of 16 mph in a horse and buggy. How far did she travel?
7. Sadie ran a 20-mile race at 5 mph. For how many hours did Sadie run?
8. Solomon walked 2 hours at an average speed of 4.5 miles per hour. How far did he walk?
9. A train went 585 miles at 65 mph. How long did the trip take?
10. Marsella drove her car 306 miles in 6 hours. What was her average speed (rate) in miles per hour?
11. A train traveled 4 hours at an average speed of 35 mph. How far did it travel?
12. Lucia rode her motorcycle 407 miles at 37 mph. How long did the trip take?

Practice • Problem Solving: Using a Two-Step Equation

Lesson 18.8

READ the problem. Make a PLAN. DO the plan to solve the problem. Remember to use $c = r \times d + f$.

1. The cost to rent a car is \$25 per day plus a fee of \$50. Gil rented a car for \$250. For how many days did he rent the car?
2. The cost to rent chairs for a week is a \$30 fee plus \$5 per chair. Priscilla paid a total of \$155 to rent chairs for a week. How many chairs did Priscilla rent?
3. The cost to rent a table is \$15 per day plus a fee of \$10. Mr. Dietz paid a total of \$100 to rent a table. For how many days did he rent the table?
4. The cost to rent a tent is \$50 a day plus a fee of \$55. Marcus paid a total of \$155 to rent a tent. For how many days did Marcus rent a tent?
5. The cost to rent a boat is \$16 per hour plus a fee of \$20. Kenneth paid \$68 to rent a boat. For how many hours did he rent the boat?
6. The cost to hire a pet sitter is a \$20 fee plus \$8 per hour. Inez paid a total of \$60 to hire a pet sitter to watch her dog. For how many hours did the pet sitter work?
7. The cost to rent a bicycle is \$32 per day plus a fee of \$40. Belle paid \$328 to rent a bicycle. For how many days did she rent the bicycle?
8. The cost to hire a plumber is \$20 per hour plus \$50. Malcolm paid a total of \$110 to hire a plumber to fix his pipes. For how many hours did the plumber work?
9. The cost to pave a driveway is \$125 per square foot plus a fee of \$1,000. Nick paved his driveway for a total of \$7,250. How many square feet is Nick's driveway?
10. The cost to rent a car is \$75 per day plus a \$23 processing fee. Latoya paid a total of \$548 to rent a car. For how many days did Latoya rent the car?

Mixed Practice • Solving Equations**232**

Lessons 18.4–18.5

Solve each equation.

1. $x + 2 = 37$

2. $3y = 63$

3. $7 = m - 3$

4. $29 = \frac{m}{4}$

5. $53 = k - 5$

6. $9x = 99$

7. $4r = 28$

8. $63 = r + 45$

9. $\frac{x}{15} = 9$

10. $\frac{y}{3} - 9 = 6$

11. $\frac{m}{6} + 1 = 19$

12. $8y + 4 = 36$

13. $2 = 9r - 25$

14. $\frac{x}{8} + 16 = 23$

15. $5x + 23 = 38$

16. $45 = 15x$

17. $63 = r - 45$

18. $12 = \frac{x}{5}$

19. $\frac{t}{3} - 12 = 1$

20. $\frac{m}{7} + 4 = 10$

21. $8x - 8 = 8$

22. $3 = 2r - 21$

23. $6 = \frac{y}{3} + 3$

24. $8 = 5y + 3$

On-The-Job Math • Computer Programmer

Lesson 18.2

```
10 PRINT:"Type a number from 1 to 10"for x
20 LET y=3*x
30 LET m=4+y
40 LET a=1/m
50 PRINT:"We changed your number to:"
60 PRINT a
```

Use each number below for x in the computer program.
Find each number the computer will print.

1. 3

2. 6

3. 10

4. 4

5. 8

6. 2

```
10 PRINT:"Type a number from -10 to 15" for x
20 LET y=5+x
30 LET m=2*y
40 LET a=-m
50 PRINT:"We changed your number to:"
60 PRINT a
```

Use each number below for x in the computer program.
Find each number the computer will print.

7. 1

8. 0

9. 5

10. -1

11. 11

12. -6

Challenge • Where Are You Going? What Will It Cost?

Lesson 18.8

You have just won an all-expenses-paid trip to anywhere you want to go! All you have to do is submit an estimate of what the trip will cost. Below is your plan. Fill in the blanks with real or made-up information.

The flight to _____ is a total of _____ miles. I live _____ miles from the airport. My motel will be _____ miles from the airport. I will be gone _____ days. I must hire a sitter to watch my _____ pets and to water my _____ plants. I plan to spend an average of _____ for food each day.

Use the information you wrote in the plan above to complete each of the following.

1. You will need to take a taxi to and from your home and the airport. The initial cost for this taxi service is \$3.00 plus \$1.25 per $\frac{1}{2}$ mile or part thereof. What is your cost for a taxi to get *to* and *from* your home and the airport?
2. How many hours, both ways, will you be flying? Your planes are going to average 315 miles per hour. Use the equation $d = r \times t$.
3. You will need to take a taxi to and from your motel and the airport. The initial cost for this taxi service is \$5.00 plus \$1.00 per $\frac{1}{2}$ mile or part thereof. What is your cost for a taxi to get *to* and *from* your motel and the airport?
4. The cost of your motel is \$54. But you have a one-time coupon that will save \$25 on your hotel bill. What is the cost for you to stay at the motel?
5. The cost for your sitter is a \$25 fee plus \$2 per animal per day and \$.50 per plant per day. What is your cost for the sitter?
6. How much will you spend on food?
7. How much will your expenses for this vacation total if you include \$359 for your round-trip airfare and a \$250 cash prize?

Chapter 18 Test A • Algebra

Is the number a solution? Write *Yes* or *No*.

1. $x - 3 = 2$; $x = 5$

2. $y \div 8 = 2$; $y = 4$

Solve each expression by simplifying.

3. $24 - 6 + 2 =$

4. $(7 + 5) - (8 - 3) =$

5. $40 - 16 \div 8 =$

6. $20 - 9 \times 2 =$

Solve.

7. $3y = 21$

8. $24 = y - 16$

9. $\frac{x}{5} = 7$

10. $y - 11 = 7$

11. $r + 46 = 83$

12. $8 = \frac{y}{4}$

Solve. Use the formula $d = r \times t$.

13. When Marvin went on vacation, he drove 55 mph for 8 hours. How far did he travel?

14. Jenna flew 1,650 miles in 6 hours. What was the plane's average speed (rate) per hour?

Solve.

15. $12 = 3x + 9$

16. $\frac{m}{3} + 12 = 18$

17. $6x - 9 = 45$

18. $28 = \frac{y}{3} - 1$

Solve. Use the formula $c = r \times d + f$.

19. Lucia rented a pair of skis for \$126. The rental cost \$18 plus a daily rate of \$27. For how many days did she rent the skis?

20. Aaron rented a van for \$500. He paid \$20 per day plus a fee of \$300. For how many days did he rent the van?

Chapter 18 Test B • Algebra

Is the number a solution? Write *Yes* or *No*.

1. $x + 7 = 12$; $x = 5$

2. $5y = 15$; $y = 9$

Solve each expression by simplifying.

3. $5 + 36 \div 9 =$

4. $(6 + 7) - (9 + 1) =$

5. $54 - 6 + 8 =$

6. $17 - 4 \times 2 =$

Solve.

7. $\frac{y}{7} = 4$

8. $r - 6 = 29$

9. $11x = 77$

10. $x + 47 = 71$

11. $35 = x - 8$

12. $7 = \frac{m}{3}$

Solve. Use the formula $d = r \times t$.

13. When Melinda drove to the coast, she drove 384 miles in 8 hours. What was her average speed (rate) in miles per hour?

14. Ricardo flew 3,000 miles in 5 hours. What was the plane's average speed (rate) in miles per hour?

Solve.

15. $\frac{m}{6} - 5 = 3$

16. $3y + 8 = 17$

17. $7 = \frac{x}{2} + 4$

18. $22 = 5y - 8$

Solve. Use the formula $c = r \times d + f$.

19. Sam went for a hot-air balloon ride for \$550. The ride cost \$50 plus an hourly rate of \$125. For how many hours did he ride in the balloon?

20. Rhea rented a party tent for \$65. She paid \$15 per hour plus a fee of \$20. For how many hours did she rent the party tent?

Answer Key

UNIT 5 ALGEBRA

Chapter 18 Algebra

225 Vocabulary • Algebra

1. parentheses ()
2. variable
3. simplify
4. equation
5. solution
6. order of operations
7. number expression
8. x
9. 2

226 Review • Order of Operations

1. 12
2. 31
3. 59
4. 41
5. 10
6. 3
7. 29
8. 21
9. 11
10. 67
11. 20
12. 22
13. 72
14. 52
15. 25

227 Review • Solving Equations with Addition and Subtraction

1. $x=7$
2. $y=24$
3. $n=6$
4. $y=3$
5. $k=62$
6. $x=36$
7. $y=94$
8. $x=6$
9. $v=36$
10. $r=90$
11. $m=47$
12. $k=19$
13. $m=14$
14. $w=78$
15. $c=21$
16. $r=11$
17. $y=106$
18. $w=19$

228 Review • Solving Equations with Multiplication and Division

1. $x=6$
2. $y=27$
3. $x=5$
4. $a=16$
5. $k=52$
6. $x=101$
7. $y=15$
8. $v=3$
9. $r=9$
10. $r=1,899$
11. $x=126$
12. $c=1,407$
13. $y=2$
14. $x=84$
15. $y=12$
16. $m=100$
17. $y=14$
18. $x=200$

229 Review • Solving Equations with More Than One Operation

1. $x=5$
2. $y=5$
3. $x=6$
4. $m=10$
5. $k=7$
6. $y=3$
7. $m=2$
8. $x=3$
9. $x=35$
10. $m=72$
11. $y=16$
12. $k=20$
13. $y=7$
14. $w=15$
15. $v=4$
16. $r=48$

230 Practice • Problem Solving: Using a One-Step Equation

1. 260 mi
2. 309 mph
3. 9 hours
4. 8 mph
5. 345 mph
6. 112 mi
7. 4 hours
8. 9 mi
9. 9 hours
10. 51 mph
11. 140 mi
12. 11 hours

231 Practice • Problem Solving: Using a Two-Step Equation

1. 8 days
2. 25 chairs
3. 6 days
4. 2 days
5. 3 hours
6. 5 hours
7. 9 days
8. 3 hours
9. 50 square feet
10. 7 days

232 Mixed Practice • Solving Equations

1. $x=35$
2. $y=21$
3. $m=10$
4. $m=116$
5. $k=58$
6. $x=11$
7. $r=7$
8. $r=18$
9. $x=135$
10. $y=45$
11. $m=108$
12. $y=4$
13. $r=3$
14. $x=56$
15. $x=3$
16. $x=3$
17. $r=108$
18. $x=60$
19. $t=39$
20. $m=42$
21. $x=2$
22. $r=2$
23. $y=9$
24. $y=1$

233 On-the-Job Math • Computer Programmer

1. $\frac{1}{13}$
2. $\frac{1}{22}$
3. $\frac{1}{34}$
4. $\frac{1}{16}$
5. $\frac{1}{28}$
6. $\frac{1}{10}$
7. -12
8. -10
9. -20
10. -8
11. -32
12. 2

234 Challenge • Where Are You Going? What Will It Cost?

Answers will vary.

235 Chapter 18 Test A • Algebra

1. Yes
2. No
3. 20
4. 7
5. 38
6. 2
7. $y=7$
8. $y=40$
9. $x=35$
10. $y=18$
11. $r=37$
12. $y=32$
13. 440 mi
14. 275 mi
15. $x=1$
16. $m=18$
17. $x=9$
18. $y=87$
19. 4 days
20. 10 days

236 Chapter 18 Test B • Algebra

1. Yes
2. No
3. 9
4. 3
5. 56
6. 9
7. $y=28$
8. $r=35$
9. $x=7$
10. $x=24$
11. $x=43$
12. $m=21$
13. 48 mph
14. 600 mph
15. $m=48$
16. $y=3$
17. $x=6$
18. $y=6$
19. 4 hours
20. 3 hours