

Practice 1-1Variables and Expressions
.....**Write an expression for each quantity.**

1. the value in cents of 5 quarters _____
2. the value in cents of q quarters _____
3. the number of months in 7 years _____
4. the number of months in y years _____
5. the number of gallons in 21 quarts _____
6. the number of gallons in q quarts _____

Write a variable expression for each word phrase.

- | | |
|--|--|
| 7. 9 less than k
_____ | 8. m divided by 6
_____ |
| 9. twice x
_____ | 10. 4 more than twice x
_____ |
| 11. the sum of eighteen and b
_____ | 12. three times the quantity 2 plus a
_____ |

Tell whether each expression is a numerical expression or a variable expression. For a variable expression, name the variable.

- | | |
|----------------------------|---------------------------|
| 13. $4d$ _____ | 14. $74 + 8$ _____ |
| 15. $\frac{4(9)}{6}$ _____ | 16. $14 - p$ _____ |
| 17. $5k - 9$ _____ | 18. $3 + 3 + 3 + 3$ _____ |
| 19. $19 + 3(12)$ _____ | 20. $25 - 9 + x$ _____ |

The room temperature is c degrees centigrade. Write a word phrase for each expression.

21. $c + 15$

22. $c - 7$

Practice 1-2

The Order of Operations

Simplify each expression.

- | | |
|--|----------------------------------|
| 1. $3 + 15 - 5 \cdot 2$ _____ | 2. $5 \cdot 6 + 2 \cdot 4$ _____ |
| 3. $48 \div 8 - 1$ _____ | 4. $68 - 12 \div 2 \div 3$ _____ |
| 5. $6(2 + 7)$ _____ | 6. $25 - (6 \cdot 4)$ _____ |
| 7. $3[9 - (6 - 3)] - 10$ _____ | 8. $60 \div (3 + 12)$ _____ |
| 9. $4 - 2 + 6 \cdot 2$ _____ | 10. $18 \div (5 - 2)$ _____ |
| 11. $\frac{16 + 24}{30 - 22}$ _____ | 12. $2[4(9 - 7) + 1]$ _____ |
| 13. $(8 \div 8 + 2 + 11) \div 2$ _____ | 14. $9 + 3 \cdot 4$ _____ |
| 15. $18 \div 3 \cdot 5 - 4$ _____ | 16. $10 + 28 \div 14 - 5$ _____ |

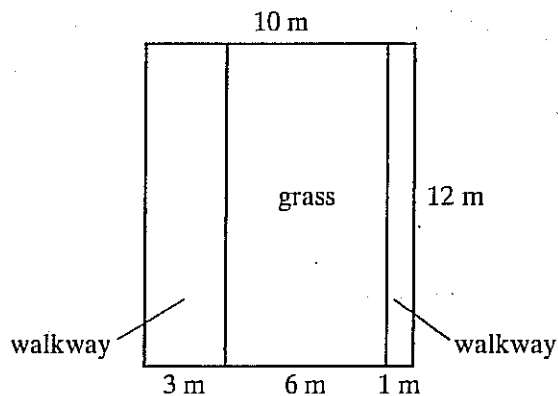
Insert grouping symbols to make each number sentence true.

- | | |
|---------------------------------|------------------------------|
| 17. $3 + 5 \cdot 8 = 64$ | 18. $4 \cdot 6 - 2 + 7 = 23$ |
| 19. $10 \div 3 + 2 \cdot 4 = 8$ | 20. $3 + 6 \cdot 2 = 18$ |

A city park has two walkways with a grassy area in the center, as shown in the diagram.

21. Write an expression for the area of the sidewalks, using subtraction.

22. Write an expression for the area of the sidewalks, using addition:



Compare. Use $>$, $<$, or $=$ to complete each statement.

- | | |
|--|--|
| 23. $(24 - 8) \div 4$ <input type="checkbox"/> $24 - 8 \div 4$ | 24. $3 \cdot (4 - 2) \cdot 5$ <input type="checkbox"/> $3 \cdot 4 - 2 \cdot 5$ |
| 25. $(22 + 8) \div 2$ <input type="checkbox"/> $22 + 8 \div 2$ | 26. $20 \div 2 + 8 \cdot 2$ <input type="checkbox"/> $20 \div (2 + 8) \cdot 2$ |
| 27. $11 \cdot 4 - 2$ <input type="checkbox"/> $11 \cdot (4 - 2)$ | 28. $(7 \cdot 3) - (4 \cdot 2)$ <input type="checkbox"/> $7 \cdot 3 - 4 \cdot 2$ |

Practice 1-3**Writing and Evaluating Expressions**
.....**Evaluate each expression.**

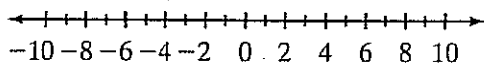
1. xy , for $x = 3$ and $y = 5$ _____
2. $24 - p \cdot 5$, for $p = 4$ _____
3. $5a + b$, for $a = 6$ and $b = 3$ _____
4. $6x$, for $x = 3$ _____
5. $9 - k$, for $k = 2$ _____
6. $63 \div p$, for $p = 7$ _____
7. $2 + n$, for $n = 3$ _____
8. $3m$, for $m = 11$ _____
9. $10 - r + 5$, for $r = 9$ _____
10. $m + n \div 6$, for $m = 12$ and $n = 18$ _____
11. $1,221 \div x$, for $x = 37$ _____
12. $10 - x$, for $x = 3$ _____
13. $4m + 3$, for $m = 5$ _____
14. $35 - 3x$, for $x = 10$ _____
15. $851 - p$, for $p = 215$ _____
16. $18a - 9b$, for $a = 12$ and $b = 15$ _____
17. $3ab - c$, for $a = 4$, $b = 2$, and $c = 5$ _____
18. $\frac{ab}{2} + 4c$, for $a = 6$, $b = 5$, and $c = 3$ _____
19. $\frac{rst}{3}$, for $r = 9$, $s = 2$, and $t = 4$ _____
20. $x(y + 5) - z$, for $x = 3$, $y = 2$, and $z = 7$ _____
21. Elliot is 58 years old.
 - a. Write an expression for the number of years by which Elliot's age exceeds that of his daughter, who is y years old. _____
 - b. If his daughter is 25, how much older is Elliot? _____
22. A tree grows 5 in. each year.
 - a. Write an expression for the tree's height after x years. _____
 - b. When the tree is 36 years old, how tall will it be? _____

Practice 1-4

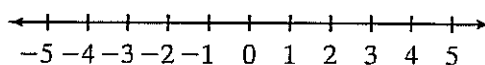
Integers and Absolute Value

Graph each set of numbers on a number line. Then order the numbers from least to greatest.

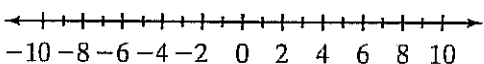
1. $-4, -8, 5$



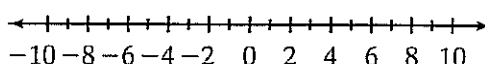
2. $3, -3, -2$



3. $0, -9, -5$



4. $-7, -1, -6$



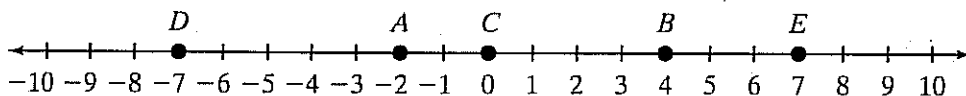
Write an integer to represent each quantity.

5. 5 degrees below zero _____
6. 2,000 ft above sea level _____
7. a loss of 12 yd _____
8. 7 strokes under par _____

Simplify each expression.

9. the opposite of -15 _____
10. $|-9|$ _____
11. $-|-25|$ _____
12. the opposite of $|-8|$ _____
13. $-|-31|$ _____
14. $|847|$ _____

Write the integer represented by each point on the number line.



15. A _____
16. B _____
17. C _____
18. D _____
19. E _____

Compare. Use $>$, $<$, or $=$ to complete each statement.

20. -3 4
21. 5 1
22. -2 -6
23. 7 $|8|$
24. $|-2|$ $|2|$
25. $|-1|$ -6
26. $|4|$ $|-5|$
27. 0 $|-7|$

Practice 1-5**Adding Integers**

Write a numerical expression for each of the following. Then find the sum.

1. climb up 26 steps, then climb down 9 steps
- _____

2. earn \$100, spend \$62, earn \$35, spend \$72
- _____

Find each sum.

3. $-8 + (-3)$

4. $6 + (-6)$

5. $-12 + (-17)$

6. $9 + (-11)$

7. $-4 + (-6)$

8. $18 + (-17)$

9. $-8 + 8 + (-11)$

10. $12 + (-7) + 3 + (-8)$

11. $-15 + 7 + 15$

12. $0 + (-11)$

13. $6 + (-5) + (-4)$

14. $-5 + (-16) + 5 + 8 + 16$

Without adding, tell whether each sum is positive, negative, or zero.

15. $192 + (-129)$

16. $-417 + (-296)$

17. $-175 + 87$

Evaluate each expression for $n = -12$.

18. $n + 8$

19. $n + (-5)$

20. $12 + n$

Compare. Write $>$, $<$, or $=$ to complete each statement.

21. $-7 + 5$ $3 + (-6)$

22. $4 + (-9)$ $6 + (-7) + (-4)$

23. An elevator went up 15 floors, down 9 floors, up 11 floors, and down 19 floors. Find the net change. _____

24. The price of a share of stock started the day at \$37. During the day it went down \$3, up \$1, down \$7, and up \$4. What was the price of a share at the end of the day?
- _____

Practice 1-6**Subtracting Integers****Use rules to find each difference.**

1. $8 - 12$

2. $13 - 6$

3. $9 - (-12)$

4. $57 - 39$

5. $-173 - 162$

6. $71 - (123)$

7. $51 - 89$

8. $-222 - (-117)$

9. $843 - 677$

10. $-98 - 183$

11. $366 - (-429)$

12. $-83 - (-48) - 65$

Find each difference.

13. $6 - 9$

14. $14 - 8$

15. $-15 - 3$

16. $-25 - 25$

17. $-16 - (-16)$

18. $32 - (-17) - 32$

Round each number. Then estimate each sum or difference.

19. $-57 + (-98)$

20. $448 - 52$

21. $-191 + (-511)$

22. $-361 - (-58)$

23. $888 + 1,177$

24. $-484 - 1,695$

Write a numerical expression for each phrase. Then simplify.25. A balloon goes up 2,300 ft, then goes down 600 ft.
_____26. You lose \$50, then spend \$35.
_____27. The Glasers had \$317 in their checking account. They wrote checks for \$74, \$132, and \$48. What is their checking account balance?

Practice 1-7

Inductive Reasoning

Write a rule for each pattern. Find the next three numbers in each pattern.

1. 3, 6, 9, 12, 15, _____, _____, _____

Rule: _____

2. 1, 2, 4, 8, 16, _____, _____, _____

Rule: _____

3. 6, 7, 14, 15, 30, 31, _____, _____, _____

Rule: _____

4. 34, 27, 20, 13, 6, _____, _____, _____

Rule: _____

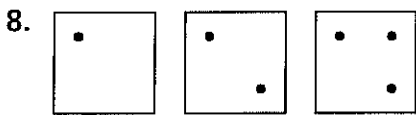
Is each statement correct or incorrect? If it is incorrect, give a counterexample.

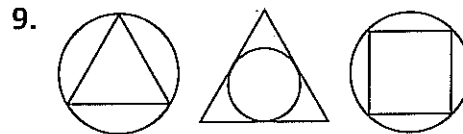
5. All roses are red.

6. A number is divisible by 4 if its last two digits are divisible by 4.

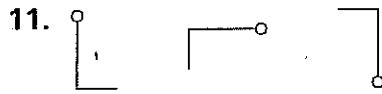
7. The difference of two numbers is always less than at least one of the numbers.

Describe the next figure in each pattern. Then draw the figure.









Practice 1-8

Look for a Pattern

Solve by looking for a pattern.

1. Each row in a window display of floppy disk cartons contains two more boxes than the row above. The first row has one box.

a. Complete the table.

Row Number	1	2	3	4	5	6
Boxes in the Row						
Total Boxes in the Display						

b. Describe the pattern in the numbers you wrote.

c. Find the number of rows in a display containing the given number of boxes.

81 _____ 144 _____ 400 _____

d. Describe how you can use the number of boxes in the display to calculate the number of rows.

2. A computer multiplied 100 nines. You can use patterns to find the ones digit of the product.

$$\underbrace{9 \times 9 \times 9 \times 9 \times \cdots \times 9}_{100 \text{ times}}$$

a. Find the ones digit for the product of:

1 nine _____ 2 nines _____ 3 nines _____ 4 nines _____

b. Describe the pattern. _____

c. What is the ones digit of the computer's product? _____

3. Use the method of Exercise 2 to find the ones digit of the product when 4 is multiplied by itself 100 times. _____

Practice 1-9**Multiplying and Dividing Integers**

Use repeated addition, patterns, or rules to find each product or quotient.

1. $23 \cdot 16$

2. $8 \cdot 7(-6)$

3. $-17 \cdot 3$

4. $-24 \div 4$

5. $-65 \div 5$

6. $117 \div (-1)$

7. $-30 \div (-6)$

8. $-21 \div (-3)$

9. $63 \div (-21)$

10. $5(-1)(-9)$

11. $-6(-3) \cdot 2$

12. $-3 \cdot 7(-2)$

13. $\frac{1,512}{-42}$

14. $\frac{-4,875}{-65}$

15. $\frac{-15(-3)}{-9}$

Compare. Use $>$, $<$, or $=$ to complete each statement.

16. $-7(5) \square -6 \cdot (-6)$

17. $-20 \cdot (-5) \square 10 \cdot |-10|$

18. $3(-6) \square -3(6)$

19. $121 \div (-11) \square -45 \div (-6)$

20. $-40 \div 8 \square 40 \div (-8)$

21. $-54 \div 9 \square 21 \div (-3)$

For each group, find the average.

22. temperatures: $6^\circ, -15^\circ, -24^\circ, 3^\circ, -25^\circ$ _____

23. bank balances: $\$52, -\$7, \$20, -\$63, -\$82$ _____

24. stock price changes: $\$6, -\$6, -\$9, \$1, \$3$ _____

25. golf scores: $-2, 0, 3, -2, -3, 1, -4$ _____

26. elevations (ft): $-120, 168, -60, -42, -36$ _____

Write a multiplication or division sentence to answer the question.

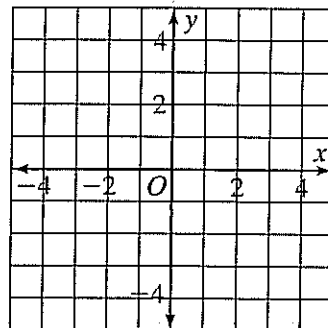
27. The temperature dropped 4° each hour for 3 hours. What was the total change in temperature?

Practice 1-10

The Coordinate Plane

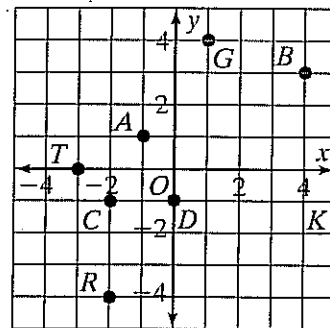
Graph each point.

- | | |
|----------------|---------------|
| 1. $A(-2, 2)$ | 2. $B(0, 3)$ |
| 3. $C(-3, 0)$ | 4. $D(2, 3)$ |
| 5. $E(-1, -2)$ | 6. $F(4, -2)$ |



Write the coordinates of each point.

- | | |
|--------------|---------------|
| 7. A _____ | 8. B _____ |
| 9. C _____ | 10. D _____ |



In which quadrant or on what axis does each point fall?

- | | |
|---------------|---------------|
| 11. A _____ | 12. B _____ |
| 13. C _____ | 14. D _____ |

Name the point with the given coordinates.

- | | |
|---------------------|----------------------|
| 15. $(1, 4)$ _____ | 16. $(-3, 0)$ _____ |
| 17. $(5, -1)$ _____ | 18. $(-2, -4)$ _____ |

Complete using *positive*, or *negative*, or *zero*.

- In Quadrant II, x is _____ and y is _____.
- In Quadrant III, x is _____ and y is _____.
- On the y -axis x is _____.
- On the x -axis y is _____.

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Chapter 1 Answers

Practice 1-1

1. $25(5)$ 2. $25q$ 3. $12(7)$ 4. $12y$ 5. $\frac{21}{4}$
 6. $\frac{q}{4}$ 7. $k - 9$ 8. $\frac{m}{6}$ 9. $2x$ 10. $2x + 4$
 11. $18 + b$ 12. $3(2 + a)$ 13. variable; d
 14. numerical 15. numerical 16. variable; p
 17. variable; k 18. numerical 19. numerical
 20. variable; x 21. 15°C warmer than the room temperature
 22. 7°C cooler than the room temperature

Practice 1-2

1. 8 2. 38 3. 5 4. 66 5. 54 6. 1 7. 8
 8. 4 9. 14 10. 6 11. 5 12. 18 13. 7
 14. 21 15. 26 16. 7 17. $(3 + 5) \cdot 8 = 64$
 18. $4 \cdot (6 - 2) + 7 = 23$
 19. $10 \div (3 + 2) \cdot 4 = 8$ 20. $(3 + 6) \cdot 2 = 18$
 21. $12 \cdot 10 - 12 \cdot 6$ 22. $3 \cdot 12 + 1 \cdot 12$
 23. $<$ 24. $>$ 25. $<$ 26. $>$ 27. $>$ 28. $=$

Practice 1-3

1. 15 2. 4 3. 33 4. 18 5. 7 6. 9 7. 5
 8. 33 9. 6 10. 15 11. 33 12. 7 13. 23
 14. 5 15. 636 16. 81 17. 19 18. 27
 19. 24 20. 14 21.a. $58 - y$ b. 33 years
 22.a. $5x$ b. 180 in.

Practice 1-4

1. -8, -4, 5
 2. -3, -2, 3
 3. -9, -5, 0
 4. -7, -6, -1
 5. -5 6. 2,000 7. -12 8. -7 9. 15 10. 9
 11. -25 12. -8 13. -31 14. 847 15. -2
 16. 4 17. 0 18. -7 19. 7 20. $<$ 21. $>$
 22. $>$ 23. $<$ 24. $=$ 25. $>$ 26. $<$ 27. $<$

Practice 1-5

1. $26 + (-9) = 17$ 2. $100 + (-62) + 35 + (-72) = 1$ 3. -11 4. 0 5. -29 6. -2
 7. -10 8. 1 9. -11 10. 0 11. 7 12. -11
 13. -3 14. 8 15. positive 16. negative
 17. negative 18. -4 19. -17 20. 0 21. $>$

22. $=$ 23. down 2 floors 24. \$32

Practice 1-6

1. -4 2. 7 3. 21 4. 18 5. -335 6. -52
 7. -38 8. -105 9. 166 10. -281 11. 795
 12. -100 13. -3 14. 6 15. -18 16. -50
 17. 0 18. 17 19. -160 20. 400 21. -700
 22. -300 23. 2,100 24. -2,200
 25. $2,300 - 600 = 1,700$ 26. $-50 - 35 = -85$
 27. $317 - 74 - 132 - 48 = 63$

Practice 1-7

1. 18, 21, 24; Start with 3 and add 3 repeatedly
 2. 32, 64, 128; Start with 1 and multiply by 2 repeatedly
 3. 62, 63, 126; Start with 6. Alternate adding 1 and multiplying by 2.
 4. -1, -8, -15; Start with 34 and subtract 7 repeatedly
 5. Incorrect. There are yellow roses. 6. Correct
 7. Incorrect. $8 - (-7) = 15$
 8. a square with 4 dots

9. a circle inside a square

10. a triangle divided into 4 triangles with the lower right one shaded

11. the third figure rotated 90° clockwise

Practice 1-8

- 1.a. 1, 3, 5, 7, 9, 11; 1, 4, 9, 16, 25, 36 b. The total in the display is the row number multiplied by itself (the row number squared) c. 9, 12, 20
 d. The number of rows is the square root of the number of boxes in the display. 2.a. 9, 1, 9, 1
 b. When 9 is multiplied an even number of times the one's digit is 1. When 9 is multiplied an odd number of times the one's digit is 9. c. 1 3. 6

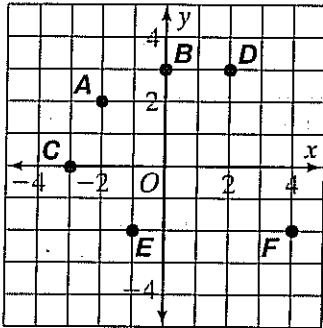
Chapter 1 Answers (continued)

Practice 1-9

- 368
- 336
- 51
- 6
- 13
- 117
- 5
- 7
- 3
- 45
- 36
- 42
- 36
- 75
- 5
- 16
- <
- =
- =
- <
- =
- >
- -11°
- $-\$16$
- $-\$1$
- 1
- 18 ft
- $3(-4) = -12$; The temperature dropped a total of 12° .

Practice 1-10

1-6.



- $(-1, 1)$
- $(4, 3)$
- $(-2, -1)$
- $(0, -1)$
- II
- I
- III
- y-axis
- G
- T
- K
- R
- negative, positive
- negative, negative
- zero
- zero

Reteaching 1-1

- $4(5), 20$
- $4(8), 32$
- $4(6), 24$
- $4(d), 4d$
- $\frac{h}{7}$
- $j - 9$
- $2x$
- $y + 2$
- $\frac{4z}{5}$
- $16d$

Reteaching 1-2

- 22
- 3
- 4
- 1
- 9
- 9
- 37
- 1
- 35
- 7
- 5
- 42
- 10
- 3
- 3
- 8
- 17
- 18
- 23

Reteaching 1-3

- 9
- 40
- 5
- 10
- 2
- 9
- 26
- 16
- 29
- 2
- 14
- 7
- 13
- 16
- 54

Reteaching 1-4

- <
- <
- >
- >
- >
- <
- >
- >
- =
- >
- >
- <
- >
- <
- >
- =
- <
- >
- <

Reteaching 1-5

- 3
- 6
- 9
- 17
- 10
- 12
- 9
- 11
- 6
- 1
- 5
- 10

Reteaching 1-6

- 3, -2
- 6, -14
- 9, 12
- 7, 5
- 10, -6
- 6, 7
- 5, -14
- 2, -4
- 8, -1

Reteaching 1-7

- Incorrect. $6 - (-4) = 10$
- Correct.
- Incorrect. $4 + 5 = 9$
- Correct.
- Incorrect. $2 + |2| = 4$
- Incorrect. The next number is 16.
- Incorrect. 6 is even, but not divisible by 4.
- Correct.

Reteaching 1-8

- 9, 11, 13; 2, 2, 2, 2, 2
- Phillipe won 13 games on the sixth day.
- 13, 18; 1, 2, 3, 4, 5
- Jennifer rode 18 miles in the sixth week. Jennifer rode 5 miles more in week 6 than in week 5.

Reteaching 1-9

- Same, Positive, 7
- Same, Positive, 48
- Opposite, Negative, -8
- Same, Positive, 18
- Opposite, Negative, -9
- Opposite, Negative, -55
- Same, Positive, 13
- Opposite, Negative, -72

Reteaching 1-10

- $(-2, -5)$
- $(4, 1)$
- $(-3, 3)$
- $(2, -1)$
- $(-1, 2)$
- $(1, -3)$
- $(-3, -2)$
- $(4, 4)$
- III
- I
- II
- IV
- II
- IV
- III
- I

Enrichment 1-1

- A
- B
- A
- A
- A
- B
- A
- A
- B
- B
- A
- B
- A

Enrichment 1-2

- 8
- 45
- 14
- 99
- 105
- 85
- 22
- 28
- do the operation + first
- 81
- 36
- 50
- 32
- 288
- 64
- 64
- 28
- 11
- 62
- 154
- 53
- 17