

2.2 Exercises

Concept Check

Fill-in-the-Blank. Complete each sentence using information found in this section.

- When adding two nonzero integers that have different signs (one positive, one negative), the answer will be the sign of the number with the _____ absolute value or 0.
- If there is no sign in front of a number, it is understood to be a/an _____ number.
- When adding two negative integers, the answer will have a/an _____ sign.
- The opposite of an integer is its _____.
- When a number is substituted for a variable in an equation, if the result is a true statement, that number is said to _____ the equation.
- The sum of two positive integers is always _____.

True/False. Determine whether each statement is true or false. If a statement is false, explain how it can be changed so the statement will be true. (**Note:** There may be more than one acceptable change.)

- When adding integers with unlike signs, the answer will be negative.
- The sum of two positive numbers can equal zero.
- The additive inverse of negative seven is -7 .
- When a number substituted for a variable makes a statement true, that number is said to be an equation.

Practice

Find the additive inverse (opposite) of each integer. See Example 5.

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|-------|----------|---------|
| 1. 15 | 3. -40 | 5. -9 |
| 2. 28 | 4. -32 | 6. 11 |

Add. See Examples 1 through 4.

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|------------------|------------------|------------------|
| 7. $4 + 9$ | 13. $14 + (-5)$ | 19. $-1 + (-16)$ |
| 8. $15 + 7$ | 14. $20 + (-11)$ | 20. $-6 + (-2)$ |
| 9. $-3 + (-5)$ | 15. $-12 + 20$ | 21. $-9 + 5$ |
| 10. $-4 + (-7)$ | 16. $-4 + 15$ | 22. $-18 + 5$ |
| 11. $73 + (-73)$ | 17. $8 + (-10)$ | 23. $-9 + 9$ |
| 12. $-10 + 10$ | 18. $19 + (-22)$ | 24. $43 + (-43)$ |

25. $-18+(-5)+(-7)$ 32. $-35+18+17$
26. $-5+(-14)+(-6)$ 33. $9+(-4)+(-5)+3$
27. $-25+(-30)+10$ 34. $12+(-5)+(-10)+8$
28. $-33+13+(-12)$ 35. $6+(-10)+7+(-23)$
29. $36+(-12)+(-1)$ 36. $10+(-5)+9+(-15)$
30. $40+(-36)+(-2)$ 37. $15+(-3)+6+(-7)$
31. $12+14+(-16)$ 38. $-26+3+(-15)+25$

Add. Be sure to find the absolute values first.

39. $13+|-5|$ 42. $|-7|+(-7)$
40. $|-2|+(-5)$ 43. $|-18|+|+17|$
41. $|-10|+|-4|$ 44. $|-14|+|-6|$

Determine whether the given integer is a solution to the equation by substituting for the variable and then adding. See Example 6.

45. $x + 5 = 7$; $x = -2$ 50. $y + 35 = -2$; $y = -37$
46. $x + 6 = 9$; $x = -3$ 51. $z + (-18) = 0$; $z = 18$
47. $x + (-3) = -10$; $x = -7$ 52. $z + (27) = 0$; $z = -27$
48. $-5 + x = -13$; $x = -8$ 53. $a + (-3) = -10$; $a = 7$
49. $y + 24 = 12$; $y = -12$ 54. $a + (-19) = -29$; $a = 10$

Add by using a calculator.

55. $6890+(-5635)+(-4560)$
56. $-8950+(-3457)+(-3266)$
57. $-10,890+(-5435)+(25,000)+(-11,250)$
58. $29,842+(-5854)+(-12,450)+(-13,200)$
59. $72,456+(-83,000)+63,450+(-76,000)$
60. $[4783+5487+(-734)]+[7125+(-8460)]$
61. $[750+320+(-400)]+[325+(-500)]$
62. $[(-500)+(-300)+400]+[(-75)+(-20)]$

Applications

Solve.

63. The table shows the reported profit or loss per quarter as reported by a business. Did the business have a total positive or negative profit for the year?

Quarter	Profit/Loss
1	\$15,000
2	-\$8000
3	-\$2000
4	\$1000

64. A passenger boards an elevator five floors below the ground floor. In this building, the ground floor is floor 0 and the floor above the ground floor is floor 1. The elevator goes up 8 floors before the passenger exits the elevator. At which floor did the passenger exit the elevator?
65. A submarine dives to a depth of 250 feet below the surface. It rises 75 feet before diving an additional 100 feet. What is the final depth of the submarine?
66. The temperature at 2 a.m. was -17°C . By 2 p.m. the temperature increased a total of 15°C . What was the temperature at 2 p.m.?
67. The tallest hill of a roller coaster is 282 feet above the ground. The hill descends 290 feet before leveling out. What is the lowest point of this hill of the roller coaster?
68. From the noon weather report to the evening weather report, the temperature changed from 72°F to 55°F . This situation can be represented by the equation $72 + t = 55$, where t represents the change in temperature. Determine which of the following values satisfies the equation: -13 , 13 , -17 , 17 .
69. At the end of the first inning of a baseball game, the home team had a score of 3 runs. At the end of the ninth inning, the home team had a score of 11 runs. This situation can be represented by the equation $3 + x = 11$, where x represents the change in score. Determine which of the following values satisfies the equation: -8 , 8 , -4 , 4 .

Writing & Thinking

Choose the response that correctly completes each statement. In each problem, give two examples that illustrate your reasoning.

70. If x and y are integers, then $x + y$ is (never, sometimes, always) equal to 0.
71. If x and y are integers, then $x + y$ is (never, sometimes, always) negative.
72. If x and y are integers, then $x + y$ is (never, sometimes, always) positive.
73. If x is a positive integer and y is a negative integer, then $x + y$ is (never, sometimes, always) equal to 0.
74. If x and y are both positive integers, then $x + y$ is (never, sometimes, always) equal to 0.

75. If x and y are both negative integers, then $x + y$ is (never, sometimes, always) equal to 0.
76. If x is a negative integer, then $-x$ is (never, sometimes, always) negative.
77. If x is a positive integer, then $-x$ is (never, sometimes, always) negative.

Solve.

78. Name two numbers that are
- six units from 0 on a number line.
 - five units from 10 on a number line.
 - nine units from 3 on a number line.
79. Name two numbers that are
- three units from 7 on a number line.
 - eight units from 5 on a number line.
 - three units from -2 on a number line.
80. Describe, in your own words, the conditions under which the sum of two integers will be 0.
81. Explain how the sum of the absolute values of two integers might be 0. (Is this possible?)
82. What is the additive inverse of 0? Why?
83. Explain how to determine if a number is a solution of an equation.