Completion Example Answers

11. $9(-1+4)-7-6\cdot 4$; $9(3)-7-6\cdot 4$; $27-7-6\cdot 4$; $27-7-24$; $20-24$; -4

Margin Exercise Answers

1. a. −15 **b.** −32 **c.** −28 **d.** −600 **e.** −3 **2. a.** 35 **b.** 0 **c.** 20 **d.** 44 **3. a.** −120 **b.** −60 **c.** 72 **d.** −125 **4. a.** −6 **b.** 6 **c.** 6 **d.** −6 **5. a.** 0 **b.** 0 **c.** undefined **d.** undefined **6. a.** −10 **b.** 4 **7. a.** 81 **b.** −81 **8.** 5 **9.** −3 **10.** −6 **11.** −12 **12.** 9 °F **13. a.** 116,800 cars **b.** 393,300 cars

2.4 Exercises

Concept Check

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

1. The product of two negative integers is always a/an _____ number.

2. A negative sign in front of a variable means the variable is being multiplied by _____.

3. The quotient of a positive integer and a negative integer is _____ .

4. The quotient of an integer divided by zero is _____.

5. The last operations to be performed are _____ and _____.

6. The value found by adding integers and then dividing the sum by the number of items in the set is the _____ of the integers.

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.)

7. The product of zero and an integer is undefined.

8. If a negative integer is divided by a positive integer, the result will be a negative number.

9. When zero is divided by any nonzero integer, the result is zero.

10. If there are no grouping symbols, multiplication should always be performed before division.

Practice

Multiply. See Examples 1 through 3.

1. $14(2)$

2. $21(3)$

3. $4(-6)$

4. $9(-4)$

5. $-2(-7)$

6. $(-6)(-3)$

7. $0(-5)$

8. $0(-1)$

9. $(-5)(3)(-4)$

10. $(-3)(7)(-5)$

11. $(-2)(-1)(-7)$

12. $(-2)(-5)(-3)$

13. $(-1)(-1)(-1)$

14. $(-3)(-3)(-3)$

15. $(-5)(-2)(5)(-1)$

16. $(-4)(1)(-5)(-3)$

17. $(-2)(-4)(-10)(-5)$

18. $(-10)(-2)(-3)(-1)$

19. $(-1)(-2)(-6)(-3)(-1)(0)(-5)(-4)$

20. $(-2)(0)(-3)(-4)(-1)(-4)(-8)(-2)$

Divide. See Examples 4 and 5.

21. $\frac{20}{4}$

22. $\frac{18}{3}$

23. $\frac{-12}{3}$

24. $\frac{-18}{6}$

25. $\frac{-28}{7}$

26. $\frac{-30}{5}$

27. $\frac{14}{-7}$

28. $\frac{50}{-5}$

29. $\frac{20}{-5}$

30. $\frac{35}{-7}$

31. $\frac{0}{2}$

32. $\frac{0}{8}$

33. $\frac{35}{0}$

34. $\frac{56}{0}$

Simplify each expression using the order of operations. See Example 7.

35. -8^2

36. -4^2

37. $(-4)^2$

38. $(-8)^2$

39. -4^3

40. -5^3

41. $(-5)^3$

42. $(-4)^3$

Simplify each expression using the order of operations. See Examples 6 through 11.

43. $\frac{18+9}{-9}$

44. $\frac{27+9}{-9}$

45. $\frac{25-4^2}{3}$

46. $\frac{50-6^2}{2}$

47. $15\div(-5)\cdot 2-8$

48. $16\div(-4)\cdot 2-9$

49. $3^3\div(-9)\cdot 4+5(-2)$

50. $20\cdot 2\div(-10)+5(-4)$

51. $-6^2+7(12)-3^2$

52. $-10^2-4(-8)-5^2$

53. $4^2\div(-8)(-2)+6(-15+3\cdot 5)$

54. $5^2\div(-5)(-3)-2(4\cdot 3)$

55. $\left[15+5\left(-2^3-7\right)\right]\div 10$

56. $\left[20-4\left(-3^2-6\right)\right]\div 8$

57. $5^2-6\cdot\left|-3\right|+2\left(5+2^3\right)$

58. $\left(-6\right)^2-4\cdot\left|-2\right|+5\left(7-3^2\right)$

59. $-27\div\left(-\left|3\right|\right)-14-4\left(-2\right)^3$

60. $-32\div\left(-\left|4\right|\right)+16-2\left(-3\right)^3$

61. $7\cdot 2^3+3^2-4^2-4\left(6-2\cdot 3\right)$

62. $5\cdot 2^4+5^2-6^2-7\left(12-3\cdot 4\right)$

63. $13-\left|-2\right|\left[\left(19-14\right)\div 5+3\left(-4\right)-5\right]$

64. $2-\left|-5\right|\left[\left(-10\right)\div\left(-5\right)\cdot 2-35\right]$

65. $-\left|2-5\right|\left[49\div\left(-7\right)+4\cdot 3-6\cdot 2+10\right]$

66. $-\left|9-11\right|\left[\left(-10\right)^2\cdot 2+6\left(-5\right)^2-10^3\right]$

Use a calculator to simplify each expression.

67. $\left(-72\right)^2-35\left(16\right)$

68. $\left(15\right)^3-60+13\left(-5\right)$

69. $\left(15-20\right)\left(13-14\right)^2+50\left(-2\right)$

70. $\left(32-50\right)^2\left(15-22\right)^2\left(17-20\right)$

71. $6-20\left[\left(-15\right)\cdot\left|-2\right|+4\left(-5\right)-1\right]$

72. $14^2-15\left[\left(-5-3\right)^2+7\left(-6\right)-\left|-2\right|\right]$

Solve.

73. If the product of –15 and –6 is added to the product of –32 and 5, what is the sum?

74. If the quotient of –56 and 8 is subtracted from the product of –12 and –3, what is the difference.

75. **a.** What number should be added to –5 to get a sum of –22?

b. What number should be added to +5 to get a sum of –22?

76. **a.** What number should be added to –39 to get a sum of –13?

b. What number should be added to +39 to get a sum of –13?

Find the average of each group of integers.

77. –10, –20, 14, 34, –18

78. 56, –64, –38, 58, –12

79. –6, –8, –7, –4, –4, –5, –6, –8

80. –25, 30, –15, –6, –26, 18

Applications

Solve.

81. Alicia bought shares of two companies on the stock market. She paid $9000 for 90 shares in one company and $6600 for 110 shares in another company. What was the average price per share for the 200 shares?

82. In a weight lifting program, two men bench pressed 300 pounds, three men bench pressed 350 pounds, and 5 men bench pressed 400 pounds. What was the average number of pounds that these men bench pressed?

83. On an English exam, two students scored 95, six students scored 90, three students scored 80, and one student scored 50. What was the average score for the class?

84. In a speech class, the students graded each other on a particular assignment. On this speech, three students scored 60, three scored 70, five scored 80, five scored 82, and four scored 85. What was the average score on this speech?

85. In the 2022 Masters Tournament, Collin Morikawa shot scores or 73, 70, 74, and 67 in four rounds of play.

a. What was his average score in each round?

b. Par was 72 on that course. How many strokes under par was his average score?

86. In the 2022 Masters Tournament, Cameron Champ shot scores of 72, 75, 71, and 70 in four rounds of play.

a. What was his average score in each round?

b. Par was 72 on that course. How many strokes under par was his average score?

87. The temperature readings for 30 days at a ski resort were recorded as follows. (All temperatures were measured in degrees Fahrenheit.)

28	24	22	10	–2	–5
–2	12	10	15	–6	5
20	13	–2	–6	–15	–18
–10	8	–1	7	20	21
32	30	22	12	3	–7

What was the average temperature recorded for the 30 days?

88. The approximate box office gross income (to the nearest thousand dollars) of the 5 top-grossing movies of 2020 are listed below. Find the average gross income of these 5 movies.

Motion Picture	US Gross ($)
Bad Boys for Life	204,418,000
1917	157,901,000
Sonic the Hedgehog	146,066,000
Jumanji: The Next Level	124,737,000
Star Wars: Episode IX - The Rise of Skywalker	124,496,000

Source: www.boxofficemojo.com

Writing & Thinking

89. If you multiply an odd number of negative numbers together, do you think that the product will be positive or negative? Explain your reasoning.

90. If you multiply an even number of negative numbers together, do you think that the product will be positive of negative? Explain your reasoning.

91. Explain the potential mistake students may make if they use the mnemonic device PEMDAS as their guide for simplifying numerical expressions.

92. Explain, in your own words, why the following expression cannot be evaluated: $\left(24-2^4\right)+6\left(3-5\right)\div\left(3^2-9\right)$.