4.3 Exercises

Concept Check

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

1. If 7.16 is multiplied by −13.497, the answer will have ____ decimal places in it.
2. When multiplying by 1000, move the decimal point _____ place(s) to the _____.
3. Move the decimal point one place to the right when multiplying by _____.
4. If the decimal point is moved 3 places to the right in the divisor, then the decimal point in the _____ must also be moved 3 places to the right.
5. Once the divisor is a whole number and the decimal point is in the proper place in the quotient, divide as with _____.
6. If a remainder is eventually 0, the decimal number is said to be a/an _____ decimal number.

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 decimal points should be aligned vertically when multiplying decimal numbers.
8. When multiplying decimal numbers, the answer should have the same number of decimal places as the total number of decimal places in the numbers being multiplied.
9. Multiplying by 100 requires that the decimal point be moved 100 places to the right.
10. Moving the decimal point in a divisor requires that the decimal point also be moved in the dividend.

Practice

Multiply. See Examples 1 through 4.

1. $(0.6)(0.7)$
2. $(0.3)(0.8)$
3. $-6(0.125)$
4. $-2(0.125)$
5. $(1.4)(0.3)$
6. $(1.5)(0.6)$
7. $(5.6)(-0.02)$
8. $(4.8)(-0.06)$
9. $(-5.48)(-0.002)$
10. $(-4.29)(-0.003)$
11. $1.6 \cdot 0.875$
12. $3.2 \cdot 0.375$
13. $-5.3 \cdot 0.75$
14. $-6.9 \cdot 0.25$
15. $4.8 \cdot 0.25$
16. $2.4 \cdot 0.75$
17. $\begin{array}{r} 6.884 \\ \times\ 9.5 \\ \hline \end{array}$

18. 5.392×6.5

19. 0.08×0.542

20. 0.833×0.04

Multiply mentally by using your knowledge of multiplication by powers of 10. See Example 6.

21. $10(-45.6)$

22. $10(-5.25)$

23. $-100(2.75)$

24. $-100(0.035)$

25. $100(16.1)$

26. $100(38.2)$

27. $1000(-0.7635)$

28. $1000(-0.4999)$

29. $10{,}000(0.00615)$

30. $10{,}000(0.01756)$

Divide. See Examples 7 and 8.

31. $-1.62 \div 9$

32. $-4.95 \div 5$

33. $0.064 \div (-0.8)$

34. $0.063 \div (-0.7)$

35. $-16.35 \div (-2.5)$

36. $-30.94 \div (-6.5)$

37. $48 \div 2.4$

38. $168 \div 5.6$

Divide and round to the nearest tenth. See Example 9.

39. $8\overline{)455}$

40. $8\overline{)261}$

41. $\dfrac{6.538}{9.4}$

42. $\dfrac{3.927}{5.3}$

43. $4.6 \div 5$

44. $5.7 \div -8$

45. $-43.721 \div 0.06$

46. $-12.847 \div 0.06$

Divide and round to the nearest hundredth. See Example 10.

47. $\dfrac{0.1463}{24}$

48. $\dfrac{0.2249}{23}$

49. $-0.42753 \div (-0.074)$

50. $-0.2433 \div (-0.065)$

51. $1.23\overline{)14.91129}$

52. $3.14\overline{)15.25631}$

53. $9\overline{)5}$

54. $9\overline{)2}$

Divide mentally by using your knowledge of division by powers of 10. See Example 13.

55. $\dfrac{38}{10}$

56. $\dfrac{167}{10}$

57. $\dfrac{-7.85}{10}$

58. $\dfrac{-6.82}{10}$

59. $-50.36 \div 100$

60. $-87.96 \div 100$

61. $45.621 \div (-1000)$

62. $10.413 \div (-1000)$

63. $\dfrac{1.54}{10{,}000}$

64. $\dfrac{169.9}{10{,}000}$

Applications

Solve.

65. Find the perimeter and area of a square with sides 4.7 mm long.

66. Find the perimeter and area of a rectangle with length 10.5 cm and width 2.8 cm.

67. To buy a car, you can pay $2036.50 in cash, or you can put down $400 and make 18 monthly payments of $104.30. How much would you save by paying cash?

68. To buy a new washer and dryer, you can pay $1737.83 in cash, or you can put $350 down and make 12 monthly payments of $129.54. How much would you save by paying cash?

69. At one point, Ohio funded its public libraries with $39.87 spent for each person. How much funding would have been received that year by a library that served a town of 23,500 people?

70. In March of 2022, the average price per kilogram paid by the United States for beef imported from Australia and New Zealand was $6.25. At this price, what would be the value of 20,500 kilograms of beef?

71. The list price for a particular automobile with accessories is $35,487. If the customer will pay cash with no trade-in, the dealer will give a discount of 0.18 times the list price. What will the car cost as a straight cash transaction? This cash value price will be the list price minus the discount.

72. A hardbound textbook has 257 pages, each of which is 0.0098 inch thick. The front and back cover are each 0.187 inch thick. How thick is the book?

73. A Blu-ray disc has a thickness of 1.2 millimeters. Every stack of Blu-ray discs is wrapped in packaging that adds 3.25 mm to the top and bottom of the stack. How thick is a stack of 16 Blu-ray discs with the packages?

74. Geoffrey works at a job with regular pay of $12.50 an hour, up to 40 hours in a week. Any work which exceeds 40 hours is paid $18.25 an hour. If he works for 53.4 hours, what will his total pay be? (Hint: First compute the pay for the first 40 hours; second, compute how many hours over time worked; third compute the overtime pay; and fourth, add the regular and overtime pay.)

75. If four new tires with custom rims cost $958.24, what did each individual tire with rim cost?

76. If you bought 6 books for a total price of $142.98, what average amount did you pay per book, including tax?

77. If the total price of a stereo was $312.70 including a tax of 0.06 times the list price, you can find the list price by dividing the total price by 1.06. What was the list price? (**Note:** 1.06 represents the list price plus 0.06 times the list price.)

78. If the total price of a tablet PC was $266.43 including a tax of 0.07 times the list price, you can find the list price by dividing the total price by 1.07. What was the list price? (**Note:** 1.06 represents the list price plus 0.07 times the list price.)

Batter, Batter, Swing!

The Houston Astros team batting average of .267 was the best of the 2021 season. The Astros had a great season that year and eventually played against the Atlanta Braves in the World Series. The Astros lost to the Braves in 2021, but went on to win the World Series in 2022.

79. In 2021, the Houston Astros had a team batting average of .267 and 1496 hits. Find the number of team at bats, to the nearest whole number, by dividing hits by batting average.

80. In 2021, Julio Urias of the Los Angeles Dodgers had 20 wins and a 0.87 wining percentage. Find Julio Urias's total number of pitching decisions (games won or lost), to the nearest whole number, by dividing wins by winning percentage.

81. Walter Payton played football for the Chicago Bears for 13 years. In those years he carried the ball 3838 times for a total of 16,726 yards. What was his average yardage per carry (to the nearest tenth)?

82. If a car travels 330 miles on 15 gallons of gas, how many miles per gallon does it average?

83. A professor has graded a test of five students, and their scores were 76.4, 100, 84.7, 10.2, and 68.3. What is the average of these five scores?

84. Suppose that the total interest paid on a 30-year mortgage for a home loan of $60,000 will be $189,570. What will be the payment each month if the payments are to pay off both the loan and the interest?

Writing & Thinking

85. In your own words, discuss the similarities and differences between multiplication with whole numbers and multiplication with decimal numbers.

86. Discuss, briefly, situations in which you might use multiplication with decimal numbers in your daily life.

87. List the steps you would follow in working a division problem with decimal numbers.

Collaborative Learning

88. Do you know how to find the gas mileage (miles per gallon) that your car is using? If you are not sure, proceed as follows and compare your mileage with other students in the class. (Your car might need some work if the mileage is not consistent or it is much worse than other similar sized cars.)

Step 1: Fill up your gas tank and write down the mileage indicated on the odometer.

Step 2: Drive the car for a few days.

Step 3: Fill up your gas tank again and write down the number of gallons needed to fill the tank and the new mileage indicated on the odometer.

Step 4: Find the number of miles that you drove by subtracting the new and old numbers indicated on the odometer.

Step 5: Divide the number of miles driven by the number of gallons needed to fill the tank. This number is your gas mileage (miles per gallon).