

3.3 Exercises

Concept Check

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

- The first step in multiplying decimal numbers is to multiply the two numbers as if they were _____.
- If 7.16 is multiplied by 13.497, the answer will have _____ decimal places in it.
- When multiplying by 1000, move the decimal point _____ place(s) to the _____.
- Move the decimal point one place to the right when multiplying by _____.
- The first 3 powers of 10 are _____, _____, and _____.

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.)

- The decimal points should be aligned vertically when multiplying decimal numbers.
- The first step in the multiplication of decimal numbers is to multiply the numbers as if they were whole numbers.
- 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.
- Multiplying by 100 requires that the decimal point be moved 100 places to the right.

Practice

Multiply. See Examples 1 through 4.

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|-------------------|--------------------|-----------------------|
| 1. $(0.6)(0.7)$ | 12. $(2.3)(0.07)$ | 23. $4(0.375)$ |
| 2. $(0.3)(0.8)$ | 13. $(7.3)(0.01)$ | 24. $8(0.325)$ |
| 3. $(0.2)(0.2)$ | 14. $(3.2)(0.03)$ | 25. $1.6 \cdot 0.875$ |
| 4. $(0.3)(0.3)$ | 15. $(0.23)(0.12)$ | 26. $3.2 \cdot 0.375$ |
| 5. $8(2.7)$ | 16. $(0.15)(0.13)$ | 27. $5.3 \cdot 0.75$ |
| 6. $4(9.6)$ | 17. $(8.1)(0.006)$ | 28. $6.9 \cdot 0.25$ |
| 7. $(1.4)(0.3)$ | 18. $(7.1)(0.008)$ | 29. $4.8 \cdot 0.25$ |
| 8. $(1.5)(0.6)$ | 19. $(0.34)(0.01)$ | 30. $2.4 \cdot 0.75$ |
| 9. $(0.2)(0.02)$ | 20. $(0.25)(0.01)$ | 31. $0.83 \cdot 6.1$ |
| 10. $(0.3)(0.03)$ | 21. $3(0.1125)$ | 32. $8.1 \cdot 0.72$ |
| 11. $(5.4)(0.02)$ | 22. $4(0.1213)$ | 33. $0.27 \cdot 0.24$ |

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|-----------------------|-----------------------------|------------------------------|
| 34. $0.36 \cdot 0.17$ | 37. 6.884
$\times 9.5$ | 39. 0.08
$\times 0.542$ |
| 35. $0.36 \cdot 0.5$ | | |
| 36. $0.28 \cdot 0.5$ | 38. 5.392
$\times 6.5$ | 40. 0.833
$\times 0.04$ |

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

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|-----------------|--------------------|-----------------------|
| 41. $10(0.435)$ | 47. $1000(4.1782)$ | 53. $10,000(0.00615)$ |
| 42. $10(0.186)$ | 48. $1000(9.7521)$ | 54. $10,000(0.01756)$ |
| 43. $100(3.46)$ | 49. $1000(0.38)$ | 55. $10,000(0.005)$ |
| 44. $100(7.82)$ | 50. $1000(0.47)$ | 56. $10,000(0.0043)$ |
| 45. $100(16.1)$ | 51. $1000(0.0079)$ | |
| 46. $100(38.2)$ | 52. $1000(0.0092)$ | |

Applications

Solve.

57. Find the perimeter and area of a square with sides 3.2 ft long.
58. Find the perimeter and area of a square with sides 4.7 mm long.
59. Find the perimeter and area of a rectangle with length 10.5 cm and width 2.8 cm.
60. Find the perimeter and area of a rectangle with length of 18.04 m and width 6.25 m.
61. 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?
62. 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?
63. 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?
64. 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?
65. The total cost of a purchase is \$583.47. If the sales tax is 0.065 of the purchase price, how much will the customer have to pay? (**Hint:** To calculate the sales tax, multiply the purchase price by the tax rate.) Round your answer to the nearest cent.

66. 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.
67. A hardbound textbook has 257 pages, each of which is 0.0098 inches thick. The front and back cover are each 0.187 inches thick. How thick is the book?
68. 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 millimeters to both the top and the bottom of the stack. How thick is a stack of 16 Blu-ray discs with the packages?
69. The salesperson at a clothing store receives a salary of \$375.50 plus a weekly commission of 0.18 times all sales over \$850 for the week. How much will that person earn if he sells \$3945 that week? (**Hint:** Compute how much over the threshold of \$850 the total sales were, and then multiply it by the rate of commission. Then add his salary to that value.)
70. 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 of overtime worked; third compute the overtime pay; and fourth, add the regular and overtime pay.)
71. You purchase four concert tickets that cost \$75.50 each and use a code to receive a discount of 0.15 times the ticket price (before fees and taxes). The taxes and fees for the purchase total \$31.97. Determine the value of the discount and the total amount paid for the tickets.
72. The price of gas is \$3.279 and you add 11.3 gallons of gas to your car's gas tank. With your fuel rewards card, you earn 2.5 points for every \$1 you spend on gas. How many reward points will you earn from this purchase? (Round your answer to the nearest whole number.)
73. A school district plans to purchase 1000 three-ring binders for the school year. If the binders will cost the school \$1.32 each, what is the total cost of the binders?
74. A craft supply company sells glass beads in packages of 10,000. Each bead weighs approximately 0.03 grams and the packaging weighs 520 grams. What is the total weight of the package?

Writing & Thinking

75. In your own words, discuss the similarities and differences between multiplication with whole numbers and multiplication with decimal numbers.
76. Discuss, briefly, situations in which you might use multiplication with decimal numbers in your daily life.