***Margin Exercise Answers***
**1.** 29.46 **2.** 62.673 **3.** 42.0667 **4.** $156.58 **5.** 5.891 **6.** 141.467 **7.** –15.55 **8.** –35.18
**9.** $8.68 **10.** $14.8x$ **11.** $43.12x - 0.701y$

# 4.2 Exercises

## Concept Check

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

1. When adding decimal numbers, write the addends _____.
2. To help keep corresponding digits aligned, _____ may be written in place of missing place values.
3. Once the numbers and decimal points have been aligned, addition or subtraction can be performed the same as with _____ numbers.
4. For subtraction of decimal numbers, keep the decimal points aligned _____.
5. The method for combining like terms with decimal number coefficients is to use the _____ property, just as with integer coefficients.

**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.)

6. Vertical alignment is the preferred method of adding decimal numbers because digits with the same place value are easily lined up.
7. It is important to align the decimal points vertically when adding decimal numbers.
8. In subtracting decimal numbers, line up all the last digits vertically.
9. Once decimal points and corresponding digits have been aligned vertically, add or subtract from left to right.

## Practice

Add. See Examples 1 through 3.

**1.**
$$\begin{array}{r} 42.08 \\ +\ 8.005 \\ \hline \end{array}$$

**2.**
$$\begin{array}{r} 14.5 \\ +\ 9.09 \\ \hline \end{array}$$

**3.**
$$\begin{array}{r} 0.09 \\ 165.1 \\ +\ 72.55 \\ \hline \end{array}$$

**4.**
$$\begin{array}{r} 3.8771 \\ 0.307 \\ +\ 4.0086 \\ \hline \end{array}$$

**5.**
$$\begin{array}{r} 1.1 \\ 0.32 \\ 2.4 \\ +\ 6.01 \\ \hline \end{array}$$

**6.**
$$\begin{array}{r} 3.2 \\ 0.39 \\ 1.004 \\ +\ 4.205 \\ \hline \end{array}$$

**7.**
$$\begin{array}{r} 37.02 \\ 25 \\ 6.4 \\ +\ 3.89 \\ \hline \end{array}$$

**8.**
$$\begin{array}{r} 5 \\ 2.37 \\ 436 \\ +\,10.88 \\ \hline \end{array}$$

**9.** $3.07 + 596$

**10.** $2.3 + 10.022$

**11.** $152.3 + 4.005$

**12.** $22.051 + 0.2006$

**13.** $2.59 + 16.9 + 0.051$

**14.** $2.48 + 51.22 + 10.734$

**15.** $9 + 5.6 + 0.58 + 25.133$

**16.** $3.766 + 9.33 + 14 + 206$

Subtract. See Examples 5 and 6.

**17.**
$$\begin{array}{r} 39.542 \\ -\,28.411 \\ \hline \end{array}$$

**18.**
$$\begin{array}{r} 46.918 \\ -\,31.702 \\ \hline \end{array}$$

**19.**
$$\begin{array}{r} 87.1 \\ -\,69.3 \\ \hline \end{array}$$

**20.**
$$\begin{array}{r} 63.4 \\ -\,27.8 \\ \hline \end{array}$$

**21.**
$$\begin{array}{r} 51.3 \\ -\,6.29 \\ \hline \end{array}$$

**22.**
$$\begin{array}{r} 72.6 \\ -\,8.54 \\ \hline \end{array}$$

**23.**
$$\begin{array}{r} 4.8 \\ -\,0.0026 \\ \hline \end{array}$$

**24.**
$$\begin{array}{r} 7.6 \\ -\,0.0097 \\ \hline \end{array}$$

**25.** $17.83 - 8.9$

**26.** $14.59 - 2.8$

**27.** $5.2 - 3.76$

**28.** $29.5 - 13.61$

**29.** $1.0057 - 0.03$

**30.** $78.015 - 13.06$

**31.** $18 - 0.4384$

**32.** $23 - 2.3196$

Add or subtract. See Examples 7 and 8.

**33.** $8.2 + 1.35 + (-22.70)$

**34.** $77.5 + (-38.1) + 56.3$

**35.** $-8.45 - 6.98$

**36.** $-44.7 - 98.61$

**37.** $-88.6 - (-91.9)$

**38.** $-4.55 - (-5.25)$

**39.** $13.4 - 22.7 + 15.6$

**40.** $167.1 - 290 + 145.3$

**41.** $2.1 + 8.2 - 1.4 - 3.1$

**42.** $-8.4 - 3.7 + 2.6 - 0.1$

**43.** $58 - 63.2 - (-14.21) + 3.5$

**44.** $-57.11 + 62.9 - 22.78 - (-5.49)$

Simplify each expression by combining like terms. See Examples 10 and 11.

**45.** $8.3x + x - 22.7x$

**46.** $9.54x - x - 12.82x$

**47.** $85.7y - 22.3y - 17.9y$

**48.** $77.5y - 34.1y - 56.3y$

**49.** $13.4t - 22.7t + 15.6t$

**50.** $16.1s - 20s + 45.3s$

**51.** $2.1x + 8.2x - y - 3.1y$

**52.** $-8.4x - 3.7x + 2y - 0.1y$

**53.** $4.3 + 6.2x - 3.1 + 9.4x$

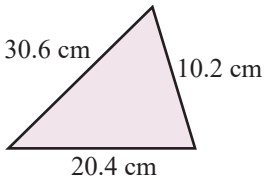
**54.** $3.9x - 6.8 - 2.9 + 4.7x$

**55.** $-9.01y + 3.3y + 7.441x - 8.51x$

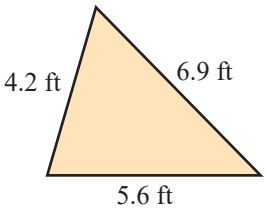
**56.** $-1.7x + 6.008y - 1.5y + 9.54x$

Find the perimeter of each figure.

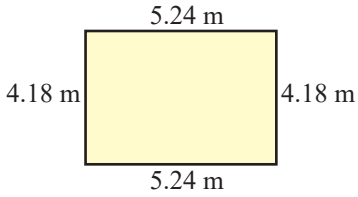
**57.**



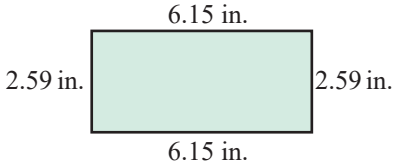

**58.**




**59.**




**60.**




## Applications

Solve.

**61.** Mr. Johnson bought the following items at a department store: slacks, $32.50; shoes, $43.75; shirt, $18.60.

**a.** How much did he spend?

**b.** What was his change if he gave the clerk a $100 bill? (Tax was included in the prices.)

**62.** Theresa got a haircut for $38.00, a manicure for $15.50, and left an $8.00 tip.

**a.** How much did she spend?

**b.** How much change should she receive from $70? (Tax was included in the prices.)

**63.** David is preparing a four-sided garden plot with unequal sides of 7.5 feet, 26.34 feet, 36.92 feet, and 12.07 feet. How many feet of edging material must he use? (This is the same as finding the perimeter of the plot.)

**64.** An architect's scale drawing shows a triangle that measures 2.25 in. on one side, 3.75 in. on the second side, and 4.5 in. on the third side. What is the perimeter of the triangle in the drawing?

**65.** Suppose your checking account shows a balance of $253.70 at the beginning of the month. During the month you make deposits of $635, $279, and $428, and you make debit purchases for $124.60, $89.55, $680, and $29.80. Find the end-of-the-month balance on your account.

**66.** Suppose your checking account shows a balance of $382.35 at the beginning of the month. During the month, you make deposits of $580.00, $300.00, $182.50, and $45.00, and you make debit purchases for $85.35, $210.50, $43.75, and $650. Find the end-of-the-month balance in your account.

**67.** In 2021, US farmers raised the following amounts of livestock: 35.1 million calves, 3.2 million sheep, and 1.6 million goats. [1]

**a.** What was the total amount of these livestock in 2021?

**b.** How many more calves than sheep were there?

**68.** In 2021, US farmers produced 117.673 million bushels of barley, 9.808 million bushels of rye, and 39.836 million bushels of oats.

**a.** What was the total US production of these three grains in 2021?

**b.** How many more bushels of barley were produced than oats?

**69.** Three pieces of wood are to be cut off of a board that is 9.7 feet long. The respective lengths being cut off are 2 feet, 3.12 feet, and 1.85 feet. Assuming that no wood is lost in the cutting process, how much is left over from the original board? This calculation must be done in two steps:

**a.** Add the total length of the three boards that were cut off.

**b.** Subtract this length from the original length of the board to find out what remains.

**70.** Arianna is an hourly worker who works a different number of hours each week. For a given month, she receives four paychecks as follows: $325.27, $450.83, $273.30, and $510.98. Each month she has to pay $352.78 for car payments, $650 for rent, and $55.25 for insurance. How much does Arianna have remaining for all of her other expenses? To find the answer, do the following three steps:

**a.** Compute her monthly pay.

**b.** Compute her total of the three listed monthly expenses.

**c.** Subtract her expenses from her monthly pay.

**71.** A group of people own three dairy cows to supply their own milk needs. During one milking, the first cow produced 2.79 gallons of milk, the second produced 5.34 gallons, while the third added 4.02 gallons. All of this milk was put into a 15.4 gallon holding bucket. [2]

**a.** How much milk did the three cows produce during this milking?

**b.** How much more milk can the bucket hold?

1 Source: US Department of Agriculture, National Agriculture Statistics Survey
2 Source: www.raw-milk-facts.com/dairy_cow_breeds.html

**72.** Kevin made the following purchases at the local grocery store: steak for $11.27, lettuce for $2.85, one tomato for $0.63, plus $0.44 for sales tax.

**a.** Compute the total cost.

**b.** If Kevin pays with a $20 bill, how much change will he receive?

**73.** Jazmin has saved $19,273.22 towards the purchase of a new car, and she will take out a loan for any extra cost. The agreed upon price of the car with its accessories is $23,925.50, and the taxes, registration fees, and insurance add up to $1437.62. How much must Jazmin borrow? (**Hint:** To solve this, first add up the total cost for the car and taxes, etc. Next, subtract Jazmin's savings to determine how much must be borrowed.)

**74.** A certain has the policy of paying overtime for all hours over 37.75 worked during a week. The daily hours Marcos worked this week were, Day 1: 8.33 hours; Day 2: 6.2 hours; Day 3: 9.87 hours; Day 4: 8.5 hours; Day 5: 10.12 hours. How many hours of overtime will Marcos receive this week? (**Hint:** First add the total number of hours worked during the week, and then subtract the threshold of 37.75 hours. The remainder will be the overtime hours.)

**75.** A special steel alloy for knife blades consists of iron, along with a mixture of other chemical elements. What is the total weight of the "ingredients" if 10 tons of iron, is combined with 0.28 ton of carbon, 1.58 ton of chromium, 0.269 ton of vanadium, and 0.0488 ton of manganese? [3]

**76.** A college student is purchasing the necessary textbooks and supplies for an education course, which consist of the textbook for $144.37, the accompanying lesson plan guide book for $38.17, and a package of 4 by 6 inch index cards for $1.79. In addition, she is purchasing a candy bar for $0.71 and a piece of bubble gum for $0.06. How much will her total be?

**77.** A young child has a bunch of change in his pocket, and he wants to purchase a comic book which costs $2.26. If he has $1.25 in quarters, $0.40 in dimes, $0.35 in nickels, and $0.07 in pennies, does he have enough money to buy the comic book? If not, how much extra must he get so that he can buy it? (**Hint:** Add up the value of his coin collection. If it exceeds the cost, he has enough money. If not, subtract the cash on hand from the cost of the comic book.)

**78.** A college student is receiving assistance from two sources which will be applied to the following expenses: $17,993.74 for tuition and fees, $7248.39 for room and board, and $1537.71 for books and supplies. If one of the sources of assistance supplies $9438.72 and the other $8300, how much must the student cover? (**Hint:** Add the total costs, add up the total assistance, and subtract this from the total cost to find how much the student must cover.)

**79.** A tightly-controlled timer is set at 759.99991 seconds.

**a.** What will its setting be if the time is decreased by 1.00082 seconds?

**b.** What will its setting be if the original time is increased by 1.00082 seconds?

**80.** An oven with very precise temperature control is 400.2 °F. If the temperature is reduced by 15.327 degrees, what will be the new temperature?

3 Source: zknives.com/knives/steels/steelchart.ph

**81.** Four unequal lemons were squeezed for juice, and they put out 0.0043 liter, 0.00056 liter, 0.01002 liter, and 0.0097 liter respectively. Compute the total amount of juice collected.

**82.** Tim eats dinner at a restaurant. The appetizer costs $8.23, the entrée costs $21.78, the beverage costs $2.63, and the dessert costs $6.47 (the tax is included in these costs). If he gives a $7.50 tip, what is the total cost of the meal?

**83.** Raven sells her crafts at a farmers market each weekend. On Saturday, she sold items for $15.76, $17.24, and $34.22.

**a.** Compute her total revenue.

**b.** If Raven set a revenue goal of $100 for the weekend, how much revenue must she make on Sunday to reach her goal?

**84.** Miguel is participating in an online health challenge to walk 7.7 miles in one week. So far, he has walked 2.3 miles, 1.5 miles, 0.6 miles, and 1.2 miles.

**a.** How many miles has Miguel walked so far?

**b.** How many more miles must Miguel walk to complete the challenge?

## Writing & Thinking

**85.** Why is it important that the decimal points and numbers be aligned vertically when adding or subtracting decimals?

**86.** Describe a problem where adding zeros might be helpful in adding or subtracting decimal numbers.

**87.** Suppose that you are given two decimal numbers with 0 as their whole number part.

**a.** Explain how the sum might be more than 1.

**b.** Explain why the sum cannot be more than 2.

**88.** Suppose you are given two decimal numbers with 0 as their whole number parts.

**a.** Explain why the difference would be less than 1.

**b.** Explain how the difference might be 0.

**89.** Sophia was asked to find the sum: 4.689 + 14.03. Her work is below. Explain why her answer is incorrect.

$$\begin{array}{r} {\scriptstyle 1}\quad{\scriptstyle 1} \\ 4.689 \\ +14.03 \\ \hline 6.092 \end{array}$$