Get in Line

Adding and Subtracting Decimals

2

WARM UP

Rewrite a decimal in each pair so that each has the same number of digits after the decimal point.

1. 4.6 and 5.08
2. 17.602 and 9.2
3. 25.077 and 12.09
4. 2.5467 and 62.1

LEARNING GOALS

- Estimate decimal sums and differences.
- Use the standard algorithm to add and subtract decimals.

You have compared decimals by looking at the place values of the digits to the right of the decimal point. How can you use place value to add and subtract decimals?

A Bit Fitter

Estimation is a helpful strategy when computing with decimals and can give you a sense of the reasonableness of a solution.

Jennie has a goal to run at least 25 kilometers each week. Her fitness app tracks the distances she runs each day and gives her a summary at the end of the week. The table shows the summary for this week.

Day	Kilometers
Monday	4.75
Tuesday	5.5
Wednesday	6.25
Thursday	2.15
Friday	1.6

1. Round each decimal value to the nearest whole number and then estimate the total distance Jennie ran this week.

Samuel added the distances Jennie ran and said she ran about 14 kilometers this week.

Samuel

1 2
4.75
5.5
6.25
2.15
11.6
13.86

2. Jennie knew she ran more than 14 kilometers. What did Samuel do incorrectly when calculating the kilometers Jennie ran?

ACTIVITY
2.1 Adding and Subtracting Decimals

When you add or subtract decimals, it is important to align the digits in like place values. Let's consider adding decimals.

WORKED EXAMPLE

$3.421 + 9.5 + 12.85 = ?$

Before calculating the sum, estimate the answer so you know the approximate sum.	$3 + 10 + 13 = 26$
To calculate the exact sum, line up the decimals so that like place values are in the same column. You can insert trailing zeros to help you align numbers in the correct place-value column.	$\begin{array}{r} 3.421 \\ 9.500 \\ +\ 12.850 \\ \hline 25.771 \end{array}$

The estimate of 26 and the actual sum of 25.771 are reasonably close, so the sum appears to be correct.

1. Recall the situation in the Getting Started. How many total kilometers did Jennie actually run?

TAKE NOTE...

In a decimal, a trailing zero is any zero that appears to the right of both the decimal point and every digit other than zero.

2. Calculate each sum.

a. 15.85 + 3.2 + 7.03

b. 4.347 + 18 + 130.6 + 51.1

c. 5.804 + 126.19 + 7.236 + 38.3

You can use a similar algorithm for subtracting decimals. Let's consider two different subtraction problems.

WORKED EXAMPLE

	$18.205 - 3.91$	$22.4 - 8.936$
First, estimate the answer so you know the approximate difference.	$18 - 4 = 14$	$22 - 9 = 13$
Then, line up the decimals so that like place values are in the same column and subtract.	$\begin{array}{r} {\scriptstyle 7\ \ 11\,10} \\ 1\,\cancel{8}\,.\,\cancel{2}\,\cancel{0}\,5 \\ -\ 3\,.\,9\,1\,0 \\ \hline 1\,4\,.\,2\,9\,5 \end{array}$	$\begin{array}{r} {\scriptstyle 1\ 11\ \ 13\ 9\ 10} \\ \cancel{2}\,\cancel{2}\,.\,\cancel{4}\,\cancel{0}\,\cancel{0} \\ -\ 8\,.\,9\,3\,6 \\ \hline 1\,3\,.\,4\,6\,4 \end{array}$
Compare the answer to your estimate to check your work.	The estimate of 14 and the difference of 14.295 are reasonably close, so the difference appears to be correct.	The estimate of 13 and the difference of 13.464 are reasonably close, so the difference appears to be correct.

3. Recall the situation in the Getting Started. If Jennie ran 20.25 kilometers, how many more kilometers does she need to run to reach her goal of 25 kilometers this week?

4. Calculate each difference.

a. 459.6 − 12.43

b. 68.998 − 9.9

c. 17.4 − 3.256

ACTIVITY
2.2

Solving Decimal Addition and Subtraction Problems

Use the algorithms you have learned about adding and subtracting decimals to solve each problem without the use of a calculator.

1. **Amy finished the first leg of her race in 87.924 seconds and the second half in 79.06 seconds. How long did it take her to complete the entire race?**

2. **Chris completed a 100-meter breaststroke swimming race in 92.542 seconds. Michael completed the 100-meter breaststroke swimming race in 95.6 seconds. How much faster was Chris than Michael?**

3. **It is 639.18 miles from Atlanta to Washington, D.C., and 881.4 miles from Atlanta to New York City.**

   a. **How much farther is it from Atlanta to New York City than it is from Atlanta to Washington, D.C.?**

   b. **If a bus goes from Atlanta to Washington, D.C., and then travels on to New York City, and finally returns to Atlanta, how many miles has it traveled?**

4. **Kara is flying to Hawaii. If her packed suitcase weighs more than 50 pounds when she checks in at the airport, she will pay a fee. Her empty suitcase weighs 11.3 pounds, and she has to pack all her camera equipment, which weighs 14.25 pounds. To stay under the weight limit, what is the maximum possible weight of her other packed items?**

NOTES

TALK the TALK

Wipe Out the Sevens

In this lesson, you learned to add and subtract decimals precisely without the use of a calculator. You will now use a calculator and number sense to complete this activity.

Use your calculator to wipe out the sevens from each number. Write the number you can subtract to wipe out the seven(s), changing them to a zero without changing the other digits. Then, write the difference.

1. 5.927 – _____ = _____
2. 769.333 – _____ = _____
3. 27.328 – _____ = _____
4. 476.0574 – _____ = _____
5. 3.407682 – _____ = _____
6. 79.7856 – _____ = _____
7. 124.27744 – _____ = _____
8. 4870.7672 – _____ = _____
9. 79.767676 – _____ = _____
10. 9.857777 – _____ = _____