

Adding Decimals

1a. Write 0.524 and 0.243 in expanded form.

1b. Remember that you can add fractions in any order you like. Use this fact to add the expanded numbers from part a. Do not reduce the fractions (you'll see why).

1c. Convert the expanded number from part b back to a decimal.

1d. What does this whole process have to do with $0.524 + 0.243$?

The standard algorithm for adding decimals is to line up the decimal point and add like places together (add the ones places together, the tenths places together, etc.).

1e. Calculate $0.524 + 0.243$ using the standard algorithm.

1f. Explain why the method of adding we did in parts a - c justifies the standard algorithm.

2a. Write 34.6 and 86.59 in expanded form.

2b. Add the expanded numbers from part a.

2c. The number you have right now is not in proper expanded form (for example, you have a term of $11 \cdot \frac{1}{10}$, which is improper). Rewrite the number so that it is in proper expanded form.

2d. Convert the expanded number from part c back to a decimal.

2e. Calculate $34.6 + 86.59$ using the standard algorithm.

2f. When you were performing the standard algorithm, what did you do about the fact that 34.6 has fewer digits than 86.59? How does the expanded form method show that this is okay?

2g. Compare the places in part b where the expanded form was improper to the places in part e where you had to carry. What do you notice? Why is this the case?

Subtracting Decimals

1a. Write 0.943 and 0.431 in expanded form.

1b. Right now, we have an expanded number minus an expanded number. Rewrite the problem (by distributing the minus) so that it is instead a problem about adding negative fractions.

1c. Add the expanded numbers from part b (do not reduce).

1d. Convert the expanded number from part c back to a decimal.

1e. What does this whole process have to do with $0.943 - 0.431$?

The standard algorithm for subtracting decimals is to line up the decimal point and subtract like places together (subtract the ones places, the tenths places, etc.).

1f. Calculate $0.943 - 0.431$ using the standard algorithm.

1g. Explain why the method of subtracting we did in parts a - d justifies the standard algorithm.

2a. Write 49.2 and 23.78 in expanded form.

2b. Rewrite the problem (by distributing the minus) so that it is instead a problem about adding negative fractions.

2c. Add the expanded numbers from part b (do not reduce).

2d. Convert the expanded number from part c back to a decimal.

2e. Calculate $49.2 - 23.78$ using the standard algorithm.

2f. When you were performing the standard algorithm, what did you do about the fact that 49.2 has fewer digits than 23.78? How does the expanded form method show that this is okay?