

Adding and Subtracting Decimals



Place Value

When adding and subtracting decimals, it is important to understand the place value of the numbers.

With $11 + 1.1$ the numbers both have 2 digits, however only one digit in each number has the same place value.

$$11 + 1.1 \neq 2.2 \text{ or } 22$$

$$11 + 1.1 = 12.1$$



Right or Wrong?

Here are some calculations involving decimals. Which have the correct answer? Where the answer is incorrect, can you explain what mistakes have been made?

$$23 + 2.3 = 25.3$$

correct

$$38 + 3.8 = 38.38$$

incorrect $38 + 3.8 = 41.8$

$$5.6 + 5.6 = 10.12$$

incorrect $5 + 5 = 10$, $6 + 6 = 12$, but $0.6 + 0.6 = 1.2$, so $5.6 + 5.6 = 11.2$

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Answers

Mental Practice

Calculate the answers to these in your head:

$2.4 + 24 =$

26.4

$5.7 - 0.57 =$

5.13

$56 - 5.6 =$

50.4

$0.04 + 37 =$

37.04

$19 + 9.1 =$

28.1

$7 - 0.06 =$

6.94

$87 + 0.34 =$

87.34

$280 - 63.2 =$

216.8

$56 - 0.26 =$

55.74

$0.23 + 0.062 =$

0.292

Write some of your own for a partner, making sure you have the answer yourself.

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Correct?

With formal methods, you need to line up the different place values. The decimal point will also be lined up.

Which calculation is correct? Explain why.

$$\begin{array}{r} 345.6 \\ + 49.24 \\ \hline \end{array}$$

The matching place values and decimal point are lined up.

✓

$$\begin{array}{r} 345.6 \\ + 49.24 \\ \hline \end{array}$$

The matching place values and decimal point are **not** lined up.

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Formal Methods

Complete these calculations using a formal written method.

$$\begin{array}{r} 38.29 \\ + 451.7 \\ \hline 489.99 \\ \hline \end{array}$$

$$\begin{array}{r} 799 \\ + 8.54 \\ \hline 807.54 \\ \hline \end{array}$$

$$\begin{array}{r} 2.08 \\ + 34.7 \\ \hline 36.78 \\ \hline \end{array}$$

$$\begin{array}{r} 394.1 \\ - 89.3 \\ \hline 304.8 \\ \hline \end{array}$$

$$\begin{array}{r} 40.2 \\ - 37.62 \\ \hline 2.58 \\ \hline \end{array}$$



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Using 0's

Sometimes it is helpful to place a 0 where a digit is not given.

$$\begin{array}{r} 345.6 \\ + 49.24 \\ \hline \\ \hline \end{array}$$

$$\begin{array}{r} 345.60 \\ + 49.24 \\ \hline \\ \hline \end{array}$$

It is more useful with subtraction.

$$\begin{array}{r} 345.6 \\ - 49.24 \\ \hline \\ \hline \end{array}$$

$$\begin{array}{r} 345.60 \\ - 49.24 \\ \hline \\ \hline \end{array}$$

Adding

$$\begin{array}{r} 345.6 \\ + 49.24 \\ \hline .4 \\ \hline \end{array}$$

Place the decimal in the correct position in the answer section. Start by adding the smallest value together.

0 hundredths +
4 hundredths =
4 hundredths

$$\begin{array}{r} 345.6 \\ + 49.24 \\ \hline .84 \\ \hline \end{array}$$

6 tenths + 2
tenths = 8 tenths

$$\begin{array}{r} 1 \\ 345.6 \\ + 49.24 \\ \hline 4.84 \\ \hline \end{array}$$

5 ones + 9 ones
= 14 ones

Place the 1 ten
into the tens
column and the
4 in the ones
column in the
answer section.

$$\begin{array}{r} 1 \\ 345.6 \\ + 49.24 \\ \hline 94.84 \\ \hline \end{array}$$

1 ten + 4 tens
+ 4 tens = 9
tens

$$\begin{array}{r} 1 \\ 345.6 \\ + 49.24 \\ \hline 394.84 \\ \hline \end{array}$$

3 hundreds +
0 hundreds =
3 hundreds

Remember to place the answers within the correct columns in the answer section.

Quick Practise

$$\begin{array}{r} 349.84 \\ + 397.16 \\ \hline 747.00 \\ \hline \end{array}$$

$$\begin{array}{r} 293.04 \\ + 517.59 \\ \hline 810.63 \\ \hline \end{array}$$

$$\begin{array}{r} 348.14 \\ + 364.57 \\ \hline 712.71 \\ \hline \end{array}$$

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Subtracting

$$\begin{array}{r}
 ^5 \\
 345.\overset{1}{\cancel{0}} \\
 - 49.24 \\
 \hline
 .\overset{1}{6} \\
 \hline
 \end{array}$$

Start by subtracting the smallest value. In this example, this is the hundredths column.

0 - 4 hundredths.

This cannot be done therefore we exchange a tenth for 10 hundredths and

regroup these. 10 + 0 = 10 hundredths.

10 hundredths - 4 hundredths = 6 hundredths.

$$\begin{array}{r}
 ^5 \\
 345.\overset{1}{\cancel{0}} \\
 - 49.24 \\
 \hline
 .\overset{1}{36} \\
 \hline
 \end{array}$$

5 tenths - 2 tenths = 3 tenths

$$\begin{array}{r}
 ^3 ^5 \\
 3\overset{1}{\cancel{4}}5.\overset{1}{\cancel{0}} \\
 - 49.24 \\
 \hline
 6.\overset{1}{36} \\
 \hline
 \end{array}$$

5 ones - 9 ones.

This cannot be done so we exchange 1 ten for 10 ones and regroup these into the ones column: 10 ones + 5 ones = 15 ones.

15 ones - 9 ones = 6 ones.

$$\begin{array}{r}
 ^2 ^3 ^5 \\
 3\overset{1}{\cancel{4}}\overset{1}{\cancel{5}}.\overset{1}{\cancel{0}} \\
 - 49.24 \\
 \hline
 96.\overset{1}{36} \\
 \hline
 \end{array}$$

3 tens - 4 tens.

This cannot be done, therefore we exchange 1 hundred for 10 tens and regroup these into the tens column: 10 tens + 3 tens = 13 tens.

13 tens - 4 tens = 9 tens

$$\begin{array}{r}
 ^2 ^3 ^5 \\
 3\overset{1}{\cancel{4}}\overset{1}{\cancel{5}}.\overset{1}{\cancel{0}} \\
 - 49.24 \\
 \hline
 296.\overset{1}{36} \\
 \hline
 \end{array}$$

2 hundreds - 0 hundreds = 2 hundreds

Remember to place the answers within the correct columns in the answer section.

Quick Practise

$$\begin{array}{r} 343.7 \\ - 121.5 \\ \hline 222.2 \\ \hline \end{array}$$

$$\begin{array}{r} 587.14 \\ - 249.56 \\ \hline 337.58 \\ \hline \end{array}$$

$$\begin{array}{r} 348.75 \\ - 124.94 \\ \hline 223.81 \\ \hline \end{array}$$

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Formal Practice

Calculate the answers to these using a formal method:

$278 + 87.5 =$

365.5

$23.01 - 8.3 =$

14.71

$703 - 27.7 =$

675.3

$323.47 + 298.2 =$

621.67

$64 + 287.2 =$

351.2

$832.19 - 287.4 =$

544.79

$23.87 + 198.5 =$

222.37

$9023.7 - 298.53 =$

8725.17

$516.4 - 67.39 =$

449.01

$492.78 + 3987.59 =$

4480.37

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