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

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.

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.

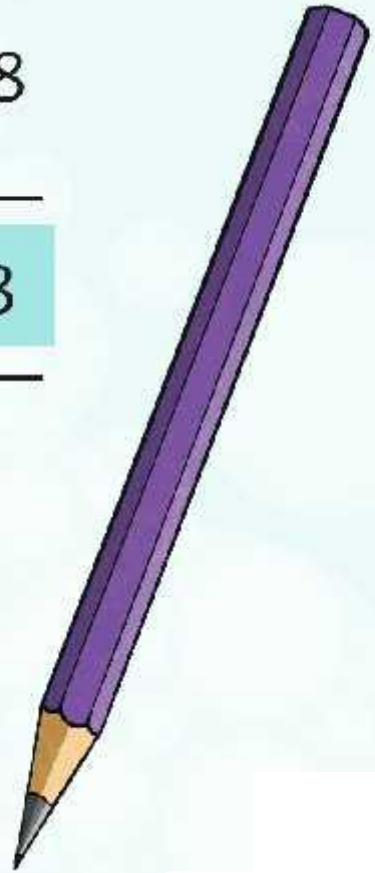
x

Formal Methods

Complete these calculations using a formal written method.

38.29	799	2.08
+ 451.7	+ 8.54	+ 34.7
489.99	807.54	36.78

394.1	40.2
- 89.3	- 37.62
304.8	2.58



Using 0's

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

$$\begin{array}{r} 345.6 \\ +\ 49.24 \\ \hline \\ \hline \end{array} \qquad \begin{array}{r} 345.60 \\ +\ 49.24 \\ \hline \\ \hline \end{array}$$

It is more useful with subtraction.

$$\begin{array}{r} 345.6 \\ -\ 49.24 \\ \hline \\ \hline \end{array} \qquad \begin{array}{r} 345.60 \\ -\ 49.24 \\ \hline \\ \hline \end{array}$$

Adding

345.6 + 49.24 . 4	345.6 + 49.24 .84	1 345.6 + 49.24 4.84	1 345.6 + 49.24 94.84	1 345.6 + 49.24 394.84
Place the decimal in the correct position in the answer section. Start by adding the smallest value together. 0 hundredths + 4 hundredths = 4 hundredths	6 tenths + 2 tenths= 8 tenths	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.	1 ten + 4 tens + 4 tens = 9 tens	3 hundreds + 0 hundreds= 3 hundreds

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

Quick Practice

349.84	293.04	348.14
+ 397.16	+ 517.59	+ 364.57
747.00	810.63	712.71

Subtracting

5 345.60 - 49.24 . 6	5 345.60 - 49.24 .36	3 5 345.60 - 49.24 6.36	2 3 5 345.60 - 49.24 96.36	2 3 5 345.60 - 49.24 296.36
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.	5 tenths - 2 tenths = 3 tenths	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.	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	2 hundreds - 0 hundreds = 2 hundreds

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

Quick Practice

343.7	587.14	348.75
- 121.5	- 249.56	- 124.94
222.2	337.58	223.81

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

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