



15 - Calculations with Decimals

Putting extra zeroes means 'there's no value at this decimal place'. In a number like 2.50, there's 'no hundredths'. So it's ok to write 2.5 as 2.50 or 2.500, etc. But DO NOT take 2.5 and make it 20.5!

Multiplying Decimals

To add decimals, follow these steps:

1. Write down the numbers, one under the other, with the decimal points aligned.
2. Put in zeros so the numbers have the same length (e.g. 2.5 becomes 2.50).
3. Then add using column addition, remembering to put the decimal point in the answer.

Example: Add 1.452 to 1.3

Line the decimals up:	$\begin{array}{r} 1.452 \\ + 1.3 \\ \hline \end{array}$	"Pad" with zeros:	$\begin{array}{r} 1.452 \\ + 1.300 \\ \hline \end{array}$	Add:	$\begin{array}{r} 1.452 \\ + 1.300 \\ \hline 2.752 \end{array}$
-----------------------	---	-------------------	---	------	---

- Multiply normally as you would with integers using column multiplication, ignoring the decimal points.
- Then, put the decimal point in the answer: count up how many numbers are after the decimal point in *both* numbers, then the answer should have that many numbers after its decimal point.

$$\begin{array}{r} 2.34 \leftarrow 2 \text{ decimal places} \\ \times 1.6 \leftarrow + 1 \text{ decimal place} \\ \hline 1404 \\ 2340 \\ \hline 3.744 \leftarrow 3 \text{ decimal places} \end{array}$$

$$\begin{array}{r} .43 \\ \times .06 \\ \hline 258 \\ \hline \end{array}$$

4 3 2 1

$$\begin{array}{r} 0.275 \times 0.54 = 0.14850 \\ \quad 275 \\ \quad \times 54 \\ \hline 1100 \\ 13750 \\ \hline 14850 \end{array}$$

Subtracting Decimals

To subtract decimal numbers:

1. Put the numbers in a vertical column aligning the decimal points.
2. Subtract each column, starting on the right and working left. ...
3. Place the decimal point in the answer directly below the decimal points in the terms.
4. Check the answer by adding.

Example: What is 7.368 - 1.15 ?

Line the decimals up:	$\begin{array}{r} 7.368 \\ - 1.15 \\ \hline \end{array}$	"Pad" with zeros:	$\begin{array}{r} 7.368 \\ - 1.150 \\ \hline \end{array}$	Subtract:	$\begin{array}{r} 7.368 \\ - 1.150 \\ \hline 6.218 \end{array}$
-----------------------	--	-------------------	---	-----------	---

Dividing by Decimals

- The trick is to change the number we are dividing by to a whole number first, by shifting the decimal point of both numbers to the right:

$$7.5 \div 0.25 \rightarrow 750 \div 25$$

$$\begin{array}{r} 30 \\ 25 \overline{) 750} \\ \hline \end{array}$$

Now we are **dividing by a whole number**, and can continue as normal using bus-stop method. It is safe to do this if we remember to shift the decimal point of **both numbers** the same number of places.

Example

$$6 \div 0.3 \rightarrow 60 \div 3 = 20$$

Example

$$0.546 \div 0.07 \rightarrow 54.6 \div 7 = 9.8$$

$$\begin{array}{r} 9.8 \\ 7 \overline{) 54.6} \\ \hline \end{array}$$

Linked Prior Topics

Place value, column addition / subtraction of integers, column multiplication of integers, bus-stop division of integers

Vocabulary

calculate, addition, subtraction, multiplication, division, decimal, integer

Linked Future Topics

Estimating using calculations, bounds